CONCEPTS OF CHOICE, MORALITY, AND PROSOCIAL BEHAVIOR IN

EARLY CHILDHOOD

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CONCEPTS OF CHOICE, MORALITY, AND PROSOCIAL BEHAVIOR IN EARLY CHILDHOOD

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Choice is critical for a variety of positive developmental outcomes, including self-esteem, well-being, and intrinsic motivation. The intuition that our actions are freely chosen is also important for our causal reasoning and our moral evaluations of others. In this dissertation, I explore the interplay between young children's concepts of choice and their emerging morality. Chapter 1 reviews current theories of moral development and sets up ideas for future investigations. Chapter 2 explores three related questions: (i) What do children's early concepts of choice look like?; (ii) Do children believe moral and social actions are choices?; and (iii) What are developmental and cultural variations in children's beliefs about moral actions as choices? Chapter 3 focuses on how children make the choice between following moral/social obligations and following their own desires. Chapter 4 directly investigates whether children's ideas of choice influence their emerging prosocial behavior. Finally, Chapter 5 reviews how concepts of choice may be intimately tied to young children's moral cognition and prosocial behavior.

BIOGRAPHICAL SKETCH

Nadia Chernyak was born in Moscow, grew up in River Edge, NJ, received her B.A. in 2008 and her M.A. in 2010 from Cornell University. During her time at Cornell, she fortunate to work as a Graduate Resident Fellow at the Hans Bethe House and as an instructor for the Cornell Prison Education Program. Her early work focused on ideas about altruism and social exclusion. She later became interested in studying young children's thinking as a means of understanding the deeper questions in psychology and cognitive science.

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I would be an irresponsible developmental psychologist if I didn't understand the important ways in which my academic development was scaffolded, shaped, and nurtured by the many great minds with which I was fortunate to interact. It is difficult to pin down the extent of my gratitude to a simple acknowledgments page.

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My many research assistants have shown a maturity, intellectual investment, and work ethic from which these projects have immensely benefitted. Among the people I have to thank are Amanda Bringhurst, Chelsea Brite, Christina Bryce, Allison

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CHAPTER 1

INTRODUCTION

The ability to understand and anticipate the needs of others, to empathize with those in distress, and to behave prosocially, cooperatively, and altruistically – in short, to think and to act morally – is indisputably fundamental to the human species. What *is* disputable, however, is how humans come to acquire such "moral" tendencies. This question has philosophical origins in as far back as 17th and 18th century (and arguably, earlier), and has been answered with a multitude of opinions. Some have argued that humans are inherently selfish and moral behavior is attributable to a selfish desire to safely cohere in social groups (Hobbes, 1651/1998); on the other end of the spectrum, others have argued that society could make better strides in capitalizing on the naturally occurring moral qualities in humans such as empathy and cooperation (Rousseau, 1755/2013).

To date, modern empirical psychology has contributed much to the understanding of morality. For example, we now can understand that various types of neural circuitry are responsible for processing morally-laden dilemmas (e.g., Decety & Howard, 2013; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001), that emotions may enhance as well as disrupt (but importantly, shape) moral judgment and action (e.g., Hoffman, 2000; Inbar, Pizarro, & Bloom, 2012; Preston & DeWaal, 2002; Valdesolo & DeSteno, 2006), and that people rely on a host of emotional and cognitive, self-interested and other-interested, rational and non-rational processes when making moral judgments (see Dunn, Aknin, & Norton, 2008; Haidt, 2001; Merritt, Effron, & Monin, 2010; Sunstein, 2005 for important examples).

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My interest, however, lies in the *acquisition* of morality – both in moral cognition and prosocial behavior. That is: how do we come to understand what "counts" as a moral rule? Where does an understanding of morality come from? What causes our commitment to helping, sympathizing with, and cooperating with others? The founders of modern moral development reasoned (in my view, correctly) that children were critical to answering these questions. For example, Piaget (1932/1997) began by surveying children of different ages about various morally-laden scenarios: Should Timmy be punished for breaking 10 cups? How about breaking 10 cups by accident? In doing so, he charted out stages that children progress through, arguing that morality begins with a focus on obedience, on rules, and on punishment. He argued that children's frameworks rarely took into account intent or higher-order principles such as justice and fairness. Children, he reasoned, use fundamentally different principles than adults when deciding how to dole out praise, punishment, and moral judgment.

Modern moral development has now moved beyond Piaget, and now finds that children have a richer, more sophisticated understanding of moral rules than previously thought. Just to list a few examples: three-year-olds distinguish the difference between moral rules (e.g., don't hit) and rules of social convention (don't wear pajamas to class; Smetana, 1984); toddlers and preschoolers punish transgressors according to the transgressors'' intentions, not actions (Dunfield & Kuhlmeier, 2010; Nelson, 1980); preschoolers sympathize with those who are harmed and not simply those who are crybabies (Hepach, Vaish, & Tomasello, 2013); elementary school-aged children believe that people have a greater moral obligation towards their in-group

members (DeJesus, Rhodes, & Kinzler, in press; Rhodes & Chalik, in press); and preschoolers believe that resources should be distributed according to effort (Kenward & Dahl, 2011; Sloane, Baillargeon, & Premack, 2012). The summation of this work, along with countless other studies that have emerged in the last 5-10 years, suggests that children's social and moral evaluations are incredibly nuanced, that judgments are flexible rather than rigidly endorsed, and that children are able to attend to a seemingly endless amount of morally-relevant features of situations.

And of course, it is worth noting that children are not simply astute moral thinkers. Contrary to the intuitive belief that children act selfishly, modern empirical work has now extensively documented the helping behaviors of children as young as 14 months (see Rheingold, 1982; Schmidt & Sommerville, 2012; Warneken, & Tomasello, 2006; Zahn-Waxler, Radke-Yarrow, & Wagner, 1992 for key examples). We also know other interesting facts about how children behave: elementary school-aged children are strongly averse to inequitable distribution of resources (Shaw & Olson, 2012), toddlers help others even in the absence of parental encouragement (Warneken & Tomasello, 2013), toddlers spontaneously console those who have been harmed (Vaish, Missana, & Tomasello, 2011), and preschoolers often engage in 'paternalistic' helping (helping that violates the helpee's immediate desires, but serves to accomplish a longer-term goal; e.g., refusing to give a marshmallow to a child who wants one but is allergic; Martin & Olson, 2013).

Such work has made great advances in elucidating the form and structure of early moral cognition and prosocial behavior, and my own dissertation is highly influenced by this research. However, my ultimate question concerns not *whether*

children possess early moral competencies, but rather on how such competencies are expressed. In asking this question, I will proceed as follows. The rest of this introduction will outline several views on moral development. The following three chapters will then provide empirical work on three distinct investigations: (1) how ideas about choice and morality are expressed across cultures and ages (Chapter 2), (2) how early prosociality (rule-abiding behavior) is affected by the cognitive input (adult explanations) that children receive (Chapter 3), and (3) how early prosociality (sharing) is affected by children's experience of choice (Chapter 4). Each study aims to paint a broader picture of how early experiences construct, develop, and elicit our moral cognition and behavior. Finally, I conclude (Chapter 5) by reviewing how each study may contribute to our understanding of morality, referencing relevant prior and ongoing investigations, and outlining fruitful areas for future research.

Terms and Distinctions

To begin, the definition of morality is controversial, and often times broadly defined. For the purposes of this dissertation, morality is defined as rules that we believe *ought to* govern our behavior. That is, we believe that we *ought* to be kind to our friends, to share with others, to avoid cheating on tests. In contrast, there are also a series of rules that *happen to* govern our behavior. For example, we *happen to* breathe oxygen, digest carbohydrates, and drive cars as a mode of transportation. More controversially, we also *happen to* wear clothing, live in nuclear family structures (at least throughout most of the United States), and value education. The question of whether any given rule is one that we *ought to* enforce, or one that we simply *happen to* enforce, is often at the core of moral debates.

A second and related distinction is one between the philosophical question of what morality *is* and the psychological question of what we *believe* morality to be. Findings from developmental psychology cannot speak directly to the philosophical question. That is, psychology cannot determine whether there actually *is* a true unified construct of morality or whether morality can ever be divorced from social convention. Psychological science can, however, assess people's beliefs about these questions. Similarly, psychology cannot answer whether moral behavior *should* involve emotional processes such as empathy, but psychology can answer whether moral acts are emotionally motivated. As such, I never focus on the normative question of what we *ought to* enforce; Instead, I focus on the question of what young children might *believe* about we ought to enforce. For example, in Chapter 2 of this dissertation, I investigate children's *beliefs* about whether moral actions (e.g., being nice to a friend) are choices, not whether moral actions are truly choices.

A third distinction is that between moral cognition and behavior. The term "morality" is used to encompass both moral cognition (*judgments* of persons, situations, and actions) and moral behavior (*actions*). Lastly, and relatedly, I wish to make a distinction between moral behavior and prosocial behavior. Moral behavior, as defined in this dissertation, concerns behavior that adheres to moral rules and principles. It is questionable, both from a psychological and philosophical perspective, whether any given human behavior can truly count as a "moral" one. For example, philosophers have debated whether moral behavior necessitates either the presence or absence of emotional (vs. rational) processes, and psychologists and economists have argued whether altruism, by definition, must be inherently selfish in nature.

The term "prosocial behavior", as used by cognitive developmentalists, is divorced from these debates. Prosocial behavior is defined as behavior that happens to – but is not necessarily designed to – benefit another person.[1] As stated earlier, psychology cannot speak directly to the normative question of what morality *is*; by extension, it therefore cannot speak directly to whether children's actions are *truly* moral. Psychology can, however, determine whether children perform actions that benefit others. The focus of this dissertation is therefore almost exclusively on prosocial behavior. Chapter 3 of this dissertation focuses on children's rule-abiding behavior, while Chapter 4 focuses on sharing and altruism.

To return to the original question of *where* morality (and prosociality) comes from, I begin by reviewing several prominent views of moral development:

Nativism

Perhaps one of the most influential papers in moral cognition research in the last decade is Hamlin, Wynn, and Bloom's (2008) study, which found that even 6-month-old infants prefer prosocial to antisocial characters. In this study, infants viewed two videos, each involving two characters: in one video, a "helper" character helped another character achieve its goal of climbing up a hill. In a second video, a "hinderer" character prevented another from achieving its goal. When infants were later presented with the helper and hinderer characters, an overwhelming majority of

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[1] It is worth noting that according to Eisenberg, Fabes, & Spinrad (2007), prosocial behavior is defined as voluntary behavior *intended* to benefit another person. However, the term prosocial behavior has been used by various researchers to refer to the helping, sharing, and cooperative behaviors of very young (toddler-aged) children (see Svetlova, Nichols, & Brownell, 2009; Warneken & Tomasello, 2009 for examples). Because the populations of children studied by such researchers tend to be quite young (14 months), it is often unclear whether the actions of these children are (a) intentional, or (b) knowingly performed with the motivation of benefiting another. As such, I use prosocial to refer to acts that happen to benefit others, with or without the motivation or intention to. See also Batson (2003) for a discussion of this issue.

children chose to play with the helper shape over the hinderer shape. Such experiments have now been widely replicated (see Hamlin, Wynn, Bloom, & Mahajan, 2011) using different actors (e.g., animals instead of shapes), different actions and goals (e.g., retrieving a ball instead of climbing a hill), and different control groups (e.g., controlling for children's desire to see goal completion).

The most notable characteristic of such research is of course the infants' young age: 6 months (see also Hamlin, Wynn, & Bloom, 2010 for a replication with 3-month-old infants). These data are provocative precisely because they show that moral judgment appears *prior* to many experiences that have long been believed to be critical to developing moral judgment. That is, because moral judgment appears in 6-month-olds who have not yet experienced formal schooling, language, peer socialization, parental modeling of behavior, or even formal discipline, we may draw the inference that such factors are *not necessary* to elicit moral judgment in young children. Such research of course leaves open the possibility that other critical experiences, which do occur in the first 6 months, are necessary to elicit moral judgment. However, because such research does not find a concrete causal factor, nor posit a likely one, the underlying presumption of consumers of this research is that moral judgment is hard-wired.

To supplement this view, the extensive documentation of the helping behavior of young children (see Warneken & Tomasello, 2009 for an overview) suggests that prosocial behavior also appears prior to explicit socialization and at only 14 months. Once again, the underlying presumptions are that prosocial behavior unfolds

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"naturally" – that is, independent of special cultural factors such as formal schooling – and that prosocial behavior appears in the course of typical development.

Evolution

A related view deserving attention is one concerning that of evolution. Evolution, unlike much of moral psychology, is concerned with *ultimate* causes – that is, what humans have *evolved* to do in order to increase their evolutionary fitness. Evolutionary models argue that behaviors such as altruism, empathy, or prosociality are prominent precisely because they were adaptive to the survival of the human species, and therefore evolved over evolutionary time (see Axelrod, 1984; De Waal, 2008; Hamilton, 1964; Nowak, 2006; and Trivers, 1971 for reviews and examples). In support of the evolutionary view, a few distinct studies have now discovered that our genetic ancestors (monkeys) also help others achieve their goals (though not at the same rates, or as spontaneously as humans do), share food, and are, at least in some contexts, sensitive to the well-being of their conspecifics (see Clutton-Brock, 2009 for a review). For example, Lakshminarayan and Santos (2008) found that capuchin monkeys, when faced with a choice to pull a lever that will deliver a treat to another monkey (or a lever that will not), reliably make the choice to be generous and deliver the treat. The prominence of such behaviors is debated (e.g., see Skerry, Sheskin, & Santos, 2011). However, if we presume that at least some forms of prosociality appear in monkeys, then the data lend support to the nativist view by showing that prosocial behavior appears independent of structures specific to human societies, such as formal schooling, culture, and language.

Social Learning

A concurrent view of moral development is that neither moral cognition nor prosocial behavior is present at birth; rather, both are transmitted through formal cultural practices such as schooling, peer relationships, and parent-child attachment bonds. Prosociality, it is argued, is therefore pedagogically transmitted from adult to child both formally and informally (for an overview of many of these views, see Eisenberg, Fabes, & Spinrad, 2007). Research from this tradition covers a rather wide variety of views about the innate specificity of moral beliefs, and I will characterize them very broadly. To give a classic example, Bandura, Ross, and Ross (1961) discovered that children behaved more aggressively towards a toy doll after watching an adult model demonstrate that behavior. These researchers posit that children are strong imitators of adult behavior, and abstract appropriate methods of behaving towards others by mimicking those around them. In a similar demonstration, a more recent experiment by Williamson, Donohue, and Tully (2012) found that 2-year-old children were more likely to help another person in distress after watching an adult experimenter do so. These findings often suggest that a domain-general social learning mechanism (e.g., imitation) allows for the transmission of a wide array of possible content to be transmitted (e.g., prosocial behavior).

Social learning theories often imply that because culture accounts for the expression of moral cognition and prosocial behavior, both cognition and behavior should be highly variable across cultures. A notable example is Schweder, Mahapatra, & Miller (1987), who showed that (a) children rarely, if ever, articulated moral rules that were different than those articulated by the adults in their cultures, and (b) even the cognitive distinction between moral actions and social-conventional actions, which

was argued to be a cultural universal, was culturally determined, rather than universally acknowledged (see also Turiel, 1983 for a contrasting view). Importantly, such accounts may posit either low-level (e.g., imitation), or high-level (e.g., parent-child socialization practices; e.g., Brody & Shaffer, 1992; Hoffman, 1970; Houck & Lecumeyer-Maus, 2004; McGrath, Wilson, & Frasetto, 1995) transmission practices; moreover, the transmission process itself may be either innate or socially learned.

Emotion and Physiology

Many researchers, social learning theorists included, believe that such transmission practices, which are extrinsic to the child, may elicit moral cognition and prosocial behavior when coupled with internal child-specific mechanisms (e.g., temperament, emotion). A prominent example is Kochanska (1997), who proposed an interaction between child traits and parenting practices. Her research showed that the type of parental practices that is most effective for eliciting prosocial behavior is determined by the child's own characteristics (e.g., temperament). For example, children who are fearful are most likely to display moral conscience when raised by parents who display gentle parenting practices (e.g., lack of shaming). Other researchers suggest that emotions such as sympathy, empathy, and affective perspective-taking (see Hoffman, 2000) drive prosocial behavior, but that parenting practices help elicit such empathic concern.

Notably, some research finds support that internal child qualities such as empathy and sympathy may occur independently of socialization practices. For example, Dondi, Simion, and Caltran (1999) found that even newborns vocalize distress in response to another child's distress; Similarly, Hepach, Vaish, and

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Tomasello (2012) found that 2-year-old children show empathic concern absent of social rewards. By itself, these data support a nativist view in showing that empathy occurs prior to, or in the absence of, extensive socialization. Alternatively these data may instead suggest that empathy causes prosocial responding only when combined with other (usually domain-general and non-innate) mechanisms (e.g., parenting practices).

Cognitive Development

Finally, other traditions focus on the child as an active cognitive interpreter of morally-relevant information. These theories share commonalities with social learning theories; in particular, such theories posit mechanisms such as cultural transmission or parenting practices that account for the moral cognition and prosocial behavior of young children. However, these views also suggest that children's ability to interpret and make sense of this information is dependent on other requisite cognitive abilities. Piaget (1932/1997) himself was of this tradition. Piaget proposed that children's theories take different forms at different ages/stages of development; progression through the stages then depends on factors intrinsic to the child, such as the development of abstract operational thinking.

Work from this tradition might posit child-specific, cognitive mechanisms that elicit either moral cognition or prosocial behavior. For example, Zelazo, Helwig, and Lau (1996) found that working memory, or the ability to hold in mind two rules at once, predicted children's abilities to take into account *both* intention (e.g., Did Timmy hit his friend by accident?) and outcome (e.g., Did Timmy's friend get hurt?) when making moral judgments. In another example, Lane, Wellman, Olson,

LaBounty, and Kerr (2010) found that theory-of-mind (understanding of others' beliefs and mental states) and emotion understanding (understanding of others' emotions) relate to children's ability to engage in sophisticated moral judgment.

Synthesis

The studies in this dissertation are from the cognitive development and social learning perspective. However, it is important to note that the ideas reviewed are not extensive, and other ideas about moral acquisition exist. For example, there are data that show the neurological underpinnings to moral cognition and prosocial behavior, data that show the heritability of prosociality, theories that posit that moral judgment is built from low-level mechanisms such as association (Scarf, Imuta, Colombo, & Hayne, 2012), and theories that focus solely on the content of early moral cognition while staying agnostic about how content is transmitted.

Further, the views discussed are not mutually exclusive. For example, one may posit that we have evolved to behave prosocially, but that more proximate mechanisms such as empathy and emotional states account for the expression of prosociality in present-day humans. One may posit a nativist view for certain forms of moral judgment, and a cognitive developmental view for advanced forms of moral reasoning. Theories may also be combined: children may rely on a mix of emotional, physiological, and cognitive factors, which work together to elicit moral judgment and behavior.

There is also an expanse of recent developmental work focusing on situational factors that drive prosocial behavior. For example, children are more likely to act prosocially when they are being watched by others (Engelmann, Herman, &

Tomasello, 2013), when they are primed with group membership (Over & Carpenter, 2009), when the recipient is a friend or in-group member (Dunham, Baron, & Carey, 2009), after collaborating with a peer (Warneken, Lohse, Melis, & Tomasello, 2012), and after experiencing a natural disaster (Li, Li, Decety, & Lee, 2013). Such work often focuses on children's underlying motivations for behaving prosocially. For example, data that focus on children's increased prosocial behavior in the presence of in-group members may imply that social group affiliation is a "naturally occurring" phenomenon that then promotes prosocial behavior.

New Directions and Views

In spite of doing much to advance our understanding of moral development, important questions remain. First, as noted earlier, there is now an explosion of work suggesting that children's social and moral evaluations are incredibly nuanced. The synthesis of this work suggests that children attend to a rather vast amount of information – ranging from act-based information (e.g., outcome); actor-based information (e.g., intent, group membership, status, and character traits); victim-based information (e.g., group membership and character traits); and social-norm information.

One critical question that arises from this work is how children might make sense of and interpret the multitude of moral information that is available to them. That is, how do children parse moral situations into relevant and irrelevant information? Imagine a child faced with a scenario about Timmy, who accidentally broke three of his mother's favorite teacups. The child is faced with the difficult task of deciding which features of the situation are relevant – some of which we, as adults,

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would all agree are relevant (e.g., the fact that he broke the teacups, the fact that his action was accidental), and some of which we would not (e.g., the fact that the teacups were blue). Which cognitive mechanisms support the ability to extract the relevant meaning of these moral situations? Which frameworks do children use to interpret moral information, and how do those frameworks change over time?

A second important question is whether moral cognition is connected with prosocial behavior, and what the nature of such a connection might be. Recent work has begun documenting the various motivational processes that might underlie prosocial behavior, including social group affiliation (e.g., Over & Carpenter, 2009), concern for others (Eisenberg & Miller, 1987; Hepach, Vaish, & Tomasello, 2012; Zaki & Mitchell, 2013), and the desire to build a reputation (Engelmann, Hermann, & Tomasello, 2013; Shaw, 2013). Given the varied nature of prosocial behaviors that young children display, several researchers have now theorized that different prosocial behaviors may be predicted by different motivations (for an overview, see Paulus, in press).

Once again, the synthesis of this work appears to be that children pay attention to a rather vast amount of information in choosing when and towards whom to be prosocial, including information about the outcome (e.g., How much harm was done?), the victim (e.g., Is s/he upset justifiably? Is s/he part of my social group?), the relevant social norms (e.g., Are others helping? Am I expected to help?), and the consequences (e.g., Is anyone watching me?). How do children learn to categorize situations into ones that do and don't require their prosocial behavior? The work from this dissertation will attempt to speak to this question by proposing that children's

ideas about choice are critically tied to their understanding of morality and their prosocial behavior.

In this dissertation, "choice" is defined as any action that (a) is intentional, and (b) had alternative possibilities (i.e., could have been otherwise). The first part (a) is simple to define: For example, walking down the stairs is usually considered an intentional human action, whereas falling down is not. The second part (b), however, is more difficult. Imagine you work on the 5th floor of your building and take the stairs every day. One might argue that your intentional action of taking the stairs in order to get to work on time is necessary (i.e., *must* occur) and is therefore *not* a choice. If, however, your building also has an elevator, your action of taking the stairs is *not* necessary and may be considered a *choice*. That is, the non-occurred, but possible action, of taking the elevator is an *alternative possibility* to the occurred action of taking the stairs.

Notions of choice, as you will read in the following chapters, are highly critical to our moral evaluations of others (e.g., Pizarro & Helzer, 2010). For example, our legal system relies on the intuition that criminals are punished because they *chose* to perform harmful acts. Similarly, we hold the intuition that perpetrators who had no alternative possibilities (i.e., had no choice, as in the case of self-defense) should not be punished. For children, choice is critical for a variety of positive developmental outcomes including self-esteem, intrinsic motivation, and well being (Ryan, & Deci, 2000).

This dissertation focuses on whether choice might be critical to young children's moral thinking and prosocial behavior. I investigate (a) which human

actions children consider to be choices (Chapter 2), (b) how children make the choice between following personal desires and following rules (Chapter 3), and (c) how the experience of choice is tied to children's prosocial behavior (Chapter 4). I conclude by reviewing future directions and possible areas of investigation.

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CHAPTER 2

NEPALESE AND AMERICAN CHILDREN'S CONCEPTS OF FREEDOM OF

CHOICE AND SOCIAL CONSTRAINT

Introduction

Our folk psychology depends on the ability to reason about freedom of choice.

The universal belief that we are "free" to act on our desires and, therefore, to "choose"

our intended course of action, is fundamental to our everyday social cognition (Baer,

Kaufman, & Baumeister, 2008). At the same time, the belief that actions may be

"unfree," or constrained by the physical, mental, and social world, similarly informs

our understanding of agency, causal attribution, and moral responsibility (Nichols &

Knobe, 2007; Pizarro & Helzer, 2010; Vohs & Schooler, 2008). To what extent are

these important cognitions universal, and to what extent are they transmitted through

culture, and learned over developmental time? To investigate this question, my

collaborators and I interviewed children of a broad range of ages (4-11) in two

cultures (Nepal and the United States) about their intuitions regarding freedom of

choice and situational constraint.

Recent work in developmental psychology has documented that young

children have some basic understanding of freedom of choice. For example, young

children understand that their own actions, and those of other agents, are freely willed

(Chernyak & Kushnir, in press; Kushnir, Wellman, & Chernyak, 2009; Nichols,

2004). That is, children affirm that, all else being equal, both their own actions and the

actions of others "could have been otherwise."

A second and related cognition is that of situational constraint. To adults, "free will can't really mean that at any point a person's behavior is totally unpredictable (and therefore entirely unconstrained)" (p. 4, Baer et al., 2008). Past literature points to two constraints that children understand as early as the preschool period. First, infants have some notion of how the physical world may constrain the actions of agents. For example, infants infer that people's paths are constrained by the laws of physics (i.e., one cannot pass through a solid brick wall; Gergerly & Csibra, 2003). Second, infants and preschoolers understand how mental states (i.e., knowledge) may influence one's decisions, actions, and beliefs (Onishi & Baillargeon, 2005; Wellman, 1990). Supporting the notion that preschoolers believe that the physical and mental world restricts one's freedom of choice, Schult and Wellman (1997) found that children judge certain acts to be physically or biologically impossible, and therefore constrained (see also Kalish, 1998). Similarly, Chernyak, Kushnir, and Wellman (2010) and Kushnir et al. (2009) found that preschool-aged children judge their own actions as determined by physical laws and knowledge states.

The presence of such understandings so early in development raises the possibility that they are highly intuitive, and therefore universal. Indeed, with respect to constraints, Liu, Wellman, Tardif, and Sabbagh (2008) find that ideas about mental (i.e., knowledge) constraints are seen across cultures and develop during the preschool years. Similarly, a recent study examining adult intuitions across cultures found that belief in free will is not culture-dependent (Sarkissian, Chatterjee, De Brigard, Knobe, Nichols, & Sirker, 2010). Other work finds that young children value personal choice equally across cultures (Helwig, 2006; Ryan & Deci, 2000). Even adults from

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collectivist, interdependent cultures – in which duty, responsibility, and role

obligations (rather than freedoms) are highly stressed – feel that those duties are freely

followed (Miller, 2003; Miller, Das, & Chakravarty, 2011; Savani, Markus, Naidu,

Kumar, & Berlia, 2010, Exp 5) and endogenously motivated (Miller & Bersoff, 1994).

On the other hand, adults across cultures differ in the extent to which they consider

certain social acts "obligations" vs. matters of personal choice. For example, Miller

and colleagues (Miller & Bersoff, 1998; Miller, Bersoff, & Harwood, 1990) found that

Americans were less likely than Hindu Indians to judge that there was a moral

imperative to help strangers, unliked others, or those only in minor need of help.

Eastern cultures also, in general, view the self – and therefore, by extension, self-

caused acts – as more "interdependent" (fitting into a larger social context) than

Western cultures (Markus & Kitayama, 1991). Taken together, this work suggests that

while basic notions of choice and constraint may be similarly endorsed across cultures,

the recognition of social obligations as constraints on action is susceptible to cultural

variability.

How and when these cultural differences emerge in development remains an

intriguing empirical question. It is possible, for example, that young children in both

Eastern and Western cultures begin with the sense that social obligations constrain

action. Evidence for this idea comes from past work, which found no differences

between British and Nepalese preschool-aged children's endorsements of social

obligations (Harris, Nunez, & Brett, 2001), and even children in Western,

individualistic societies understand that moral and social rules coerce one's ability to

act (Chernyak & Kushnir, in press; Kalish & Shiverik, 2004). Therefore, preschool-

aged children in both cultures are likely to begin with a strong notion of social constraint. However, social constraints should be viewed as ontologically distinct from physical ones, and as such, should be more susceptible to cultural change and variability. Therefore, as children develop within their respective cultures, their beliefs about social constraints should diverge along cultural lines: past developmental research has shown that the preschool to the early school-age years are associated with the emergence of many cultural differences in social cognition (Miller, 1984; Wang, 2004).

In the current study, I investigated beliefs about freedom of choice, physical and mental constraints, and social constraints in two cultural contexts: the United States and Nepal. Nepal was chosen as a representative Eastern culture that has been relatively understudied in prior cross-cultural work. It is comprised of collectivist subcultures and ethnic groups, all of which stress a strong sense of social interdependence (Cole, Walker, & Lama-Tamang, 2006). A broad age range (4-11) was chosen to investigate developmental trends in cultural differences.

I devised a questionnaire in which children were asked about their beliefs in freedom of choice and constraint. Children heard a series of vignettes, each about a character who displays a consistent behavior over time (e.g., always using a pen to draw a picture), but has a desire to engage in a new action (e.g., wants to use a pencil). Children were then asked two questions about the desired action: whether the character could choose to act (Free Choice Judgment) and whether the character is going to act (Action Prediction). Each of the items fell into the three categories: (1) simple, unconstrained actions (e.g., using a pencil instead of pen); (2) impossible

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(physically and mentally constrained) actions (e.g., floating in the air instead of falling after a jump, doing something you don't know how to do); and (3) socially constrained actions (e.g., causing harm to another, breaking rules). I included a broad range of social constraints from moral acts to social and artifact conventions, thus capturing the range of social, moral, and obligatory understandings that are present as early as the preschool years (Killen & Smetana, 2002; Smetana, 1981; Turiel, 1983).

The main hypotheses were as follows:

1) Children across cultures and ages should universally state that simple, unconstrained actions are freely chosen, whereas impossible actions are not.

2) Children across cultures and ages should universally state that people act on their desires, but not when those desires are impossible.

3) As American children age, they should show an increased tendency to state that characters can act and will act on desires which break social obligations.[2]

It was unclear whether Nepalese children would show the same tendency.

Method

Participants

Forty-five Nepalese (21 female, 23 male, 1 gender not recorded) children aged 4-11 ($M = 8.22$; $SD = 1.85$) participated. Participants from Nepal were recruited via local schools from an urban area (in Kathmandu) and rural villages (in the Annapurna Himalaya). A comparison sample of 31 American children (17 female, 14 male) aged 4-11 ($M = 7.23$; $SD = 1.73$) was recruited from two locations in the Northeast U.S: a

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[2] This hypothesis is derived from prior work (Chernyak, Kushnir, & Wellman 2010), which found that the youngest American children did *not* endorse morally-obligated acts as being freely chosen. At the same time, however, American adults endorse the idea that moral obligations are choices (Miller, 1984).

small university town, and a mid-sized city. American children were of predominantly European-American background, ranging from lower-middle to upper-middle class. Ten additional preschool-aged children (9 from Nepal: Mean age = 6.67; 1 from the US: age = 4) participated, but were excluded for indiscriminate responding (these children answered all "yes" or all "no" to the entire set of Free Choice Judgment Questions); I reasoned that such responding indicated either lack of attention or understanding of task instructions.

Procedure

A native speaker of their language interviewed all children in a quiet corner or separate room. The questionnaire was first devised in English, and then translated into Nepali by the third author. The translation was then independently verified by two local Nepalis for grammatical errors and cultural acceptability. Small changes to ensure cultural acceptability were made (e.g., changing the word "fork" to "hand"; using traditional Nepalese names for characters) for select items. For the full set of items administered to both the American and Nepalese participants, please see Appendix A and B, respectively. The questionnaire was then back-translated by an interpreter blind to the original English wording. Both versions were nearly identical.

Questionnaire

The full questionnaire consisted of 27 child-appropriate items in the following general format:

> "Peter draws a picture every day. He *always* uses a pen to make his picture.
> But today, he wants to do something different. Peter wants to make his
> picture with pencils."

The complete set of 27 items fell into 9 categories (3 items per category). See Table 2.1 for examples. In the first category of items, the target actions were simple, unconstrained actions; that is, the actions were physically possible and did not violate any known laws, norms, or rules (Free Choice items). The next two sets of items comprised impossible actions. That is, the target action was impossible because it violated either a Physical Law (e.g., gravity) or a Mental Constraint (e.g., knowledge). The next six categories comprised socially constrained items. For these, three items were included in which the target action violated a known convention: Social Norms (e.g., gender-appropriate dress), Artifact Conventions (e.g., common use), and Moral Norms (e.g., avoiding harm to another). I also included actions that violated rules (either arbitrary or justified by an appropriate explanation – i.e., Arbitrary and Justified Rules items, respectively). Finally, I included actions in which a character wants to perform an action that does not violate any conventions but comprises a selfish act. Pilot work showed that the full 27-item questionnaire was too exhausting for young children. Three 9-item questionnaire subsets were therefore created, each of which included one question from each category. Each child was then randomly assigned children to receive one of the subsets. Two orderings of the 9 items (forwards and backwards) were counterbalanced across participants.[3]

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[3] A small set of the oldest children were able to complete more than one subset. For these children, only their first responses were analyzed.

Table 2.1 Sample Questionnaire Items by Category

Category	Example
Free Choice	"Peter draws a picture every day. He *always* uses a pen to make his picture. But today, he wants to do something different. Peter *wants* to make his picture with pencils."
Physical Laws	"Bobby walks to the store every day. He *always* walks around the big brick wall. But today, he wants to do something different. Bobby *wants* to walk right through the big brick wall."
Mental Constraints	"Andrew draws pictures every day. He *always* draws a picture of a dog. But today, Andrew wants to do something different. Andrew *wants* to draw a monkey. But Andrew has never seen a monkey before. He doesn't know what a monkey looks like."
Social Norms	"Gary puts on his clothes every day before he goes outside. He *always* puts on a shirt and pants. But today, Gary wants to do something different. Gary *wants* to wear his sister's dress today."
Artifact Conventions	"It is raining in Ben's town today. He *always* uses an umbrella when it rains. But today, Ben wants to do something different. Ben *wants* to use a bucket when it rains."
Moral Norms	"Pat sees his friend every day. He *always* tells his friend something nice. But today, Pat wants to do something different. Pat *wants* to say something that will make his friend cry."
Arbitrary Rules	"Dina's mom tells her that she has to sit on the green chair during dinner. She *always* listens to her mom and sits on the green chair. But today, Dina wants to do something different. Dina *wants* to sit on the red chair."
Justified Rules	"Polly's parents tell her not to lift her little sister because she's too heavy for Polly and Polly might get hurt. Polly *always* listens to her parents and doesn't lift her little sister. But today, Polly wants to do something different. Polly *wants* to lift her little sister."
Selfish Act	"Timmy eats lunch with his friends. He *always* helps his friends clean the table after they are done eating. But today, Timmy wants to do something different. Timmy *wants* to go play outside and not help his friends clean the table."

Dependent Measures

After hearing each item, participants were asked to answer two questions related to the character's desired action: (1) a *Free Choice Judgment* regarding whether the character *can* act in line with his/her desire ("Can Peter make his picture with pencils today: yes or no?"); and (2) an *Action Prediction* regarding whether the character *will* act in line with that desire ("What do you think Peter will do today: make his picture with a pen or make his picture with pencils?").

Results

Preliminary analyses showed no effects of gender differences or differences between Nepalese participants who were recruited from rural vs. urban areas on any of the items. Data were therefore collapsed across these variables. All reported tests are two-tailed.

The first hypothesis was that children of both cultures would share the universal, early-developing intuition of free choice and the complementary notion of physical and mental constraint. Thus, no cultural differences were expected in the first three categories (Free Choice, Physical Laws, and Mental Constraints). Figure 2.1 shows responses to the Free Choice Judgment for each of these categories. The overwhelming majority of both American (29/30; 97%) and Nepalese (41/45; 91%) children answered that people could choose to perform simple unconstrained actions. Binomial tests confirmed that the proportion of children in both cultures who answered "yes" were significantly above chance, Binomial p's $< .001$. However, the
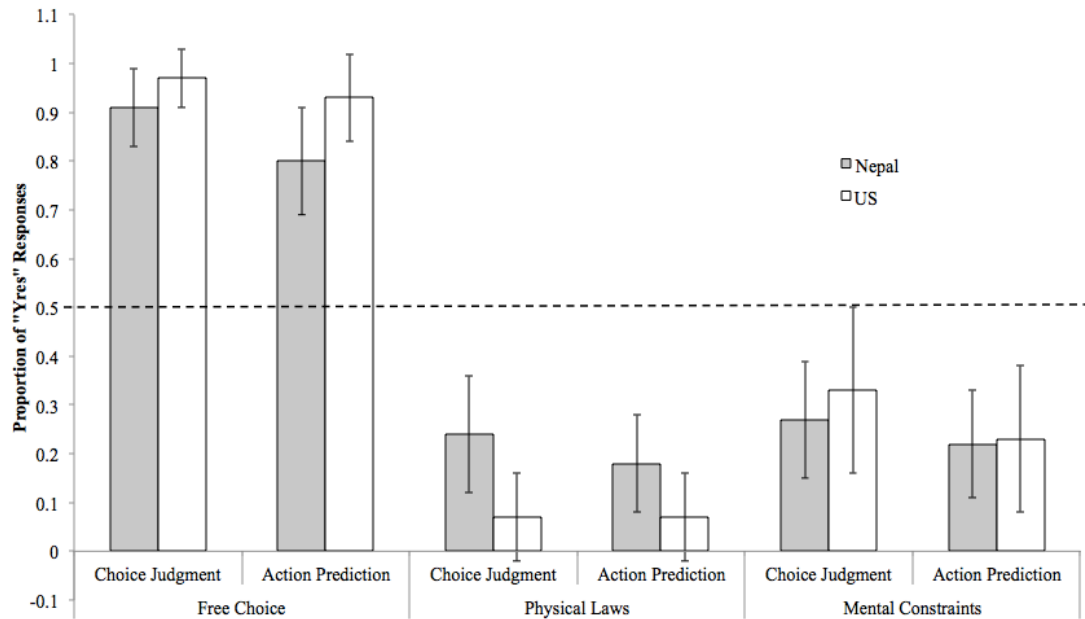
Figure 2.1. Proportion of "Yes" Responses to the Free Choice Judgment and Action Prediction Questions for the Free Choice, Physical Laws, and Mental Constraints.

Overwhelming majority of both American and Nepalese children answered that the characters could *not* act against Physical Laws (American: 28/30 (93%), Nepalese: 34/45 (76%)), or against Mental Constraints (American: 20/30 (67%); Nepalese: 33/45 (73%)). Binomial tests confirmed that the proportion of "no" responses was significantly above chance levels (all Binomial p's < .01, with the exception of American children's answers to the Mental Constraint questions, where $p = .10$) There were no cultural differences in proportion of "yes" responses in any of the above-reported categories. For averages of each item separately, by culture and age, see Appendices C and D.

To investigate whether these intuitions show any developmental or cultural variation, I performed three binary regression analyses (one each for Free Choice,

Physical Laws, and Mental Constraints). In each regression, I used culture, age, and

age x culture interaction as predictors and Free Choice Judgment as the response.

None of these predictors were significant (all p's > .05).[4] Thus, American and

Nepalese children across all age groups share the intuition that simple actions are free,

and impossible actions are not, lending support to the idea that the notions of freedom

of choice and physical and mental constraint are early-developing and culturally

universal.

The next set of analyses focused on the last hypothesis: that cultural exposure

would shape intuitions regarding what is considered a constraint on one's action.

Preliminary analyses of each of the 6 individual social constraint items showed

consistent results for each item, so data were collapsed across items (alphas ranged

from .60 to .79). Each child was assigned a score of 0 or 1 (indicating yes or no,

respectively) for each question. I then averaged Free Choice Judgments for the

socially constrained items (6 total), so that each child received an average score

between 0 and 1 representing his or her average Free Choice Judgments in the face of

social constraints. An average of 0 indicates that the child answered "no" to all of the

socially-constrained items, and a 1 indicates that the child answered "yes" to all of the

socially constrained items. One-sampled t-tests revealed that Nepalese participants'

Free Choice Judgments were significantly below chance ($M = .40$, $SD = .25$), $t(44) = -$

2.76, $p < .01$, whereas American participants' ($M = .48$, $SD = .41$) did not differ from

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[4] Additionally, two of overall regression models (Free Choice and Mental Constraints) were not significant (p's > .15). The model using Physical Constraints as the response variable, however, was significant, Chi-Square (3, N = 75) = 19.95, $p < .001$.

chance, $p > .15$. Thus, when considered as a whole, Nepalese children endorsed the notion of social constraint, whereas American children did not.

To investigate how these changes may emerge with age, I then ran a linear regression with culture, age, and age x culture interaction as the predictors, and averaged Free Choice Judgment score as the response. The resulting regression lines are shown in Figure 2.2. There was a significant effect of culture, $B = .93$, $SE(B) = .31$, $p < .01$, age, $B = .12$, $SE(B) = .03$, $p < .01$, and a culture x age interaction, $B = -.14$, $SE(B) = .04$, $p < .01$.[5]
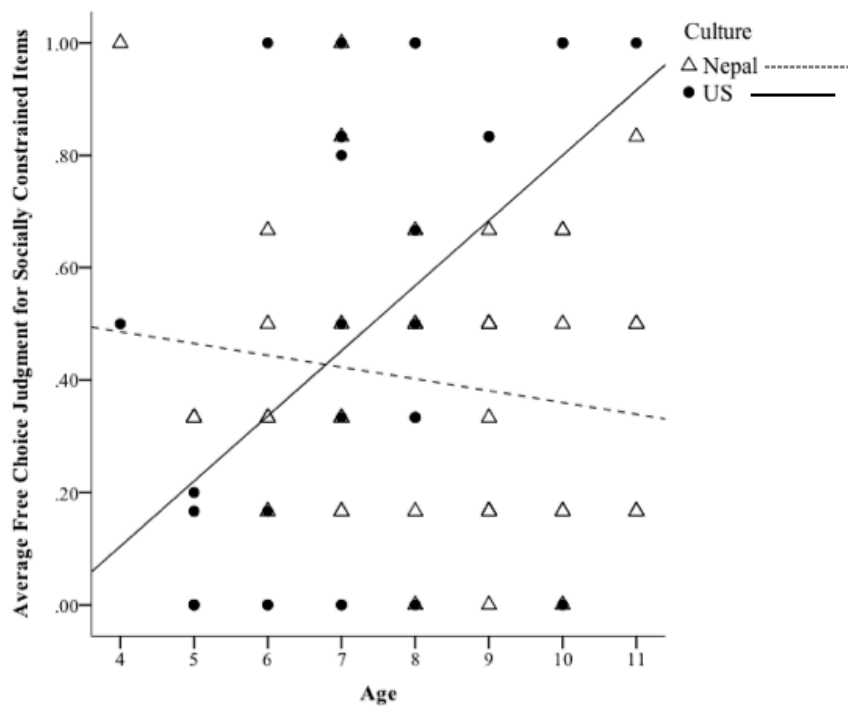
Figure 2.2. Regression Lines for Free Choice Judgment Means (0-1) of the Socially Constrained Items (Social Norms, Artifact Conventions, Moral Norms, Arbitrary Rules, Justified Rules, and Selfish Acts) vs. Age.

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[5] See Appendices E and F for analyses of regressions done separately for each item.

To investigate this interaction, I ran two follow-up regressions, separately for each culture. For the American children, age positively predicted average Free Choice Judgment averages, $B = .12$, $SE(B) = .04$, $p < .01$. However, age was not a significant predictor of Free Choice Judgment for Nepalese children ($p > .10$). The overall results thus suggest that while Nepalese children recognized that social obligations pose constraints on action across all ages, American children showed a decreased tendency to endorse obligations as constraints on actions as they aged.

The final analysis concerned hypothesized cultural differences in children's action predictions; that is, I asked whether there are age- and culture-related differences in children's predictions that people will act on desires versus social obligations. To make sure there were no wholesale cultural differences in beliefs that people act on simple (non-socially constrained) desires, I began with children's Action Prediction responses to the Free Choice, Physical Laws, and Mental Constraint items. These are shown in Figure 2.1. The overwhelming majority of both American (28/30; 93%) and Nepalese children (36/45; 80%) predicted that the characters would act on simple desires (Free Choice items). Once again Binomial tests confirmed that children's "yes" responses were significantly above chance levels, p's < .001. Moreover, children of both cultures predicted that the characters would *not* act on impossible desires (Physical Laws: American: 28/30 (93%); Nepalese: 37/45 (82%); Mental Constraints: American: 23/30 (77%); Nepalese: 35/45 (78%). Binomial tests confirmed that the proportion of "no" responses in each culture was significantly above chance, all Binomial p's < .001. Binary logistic regressions confirmed that these

results were not age- or culture-dependent (age, culture, and age x culture interactions were not significant predictors for Action Prediction scores, all p's > .05).[6] Thus, children across cultures and age groups predicted that the story characters would act on unconstrained desires, but would not act on desires that violated physical laws and mental constraints.

I then investigated developmental and cultural variation in Action Predictions for the six socially constrained items. Similar to the Free Choice Judgment analysis, I created an average Action Prediction score between 0-1. First, one-sample t-tests revealed that both American ($M = .35$, $SD = .36$) and Nepalese ($M = .27$, $SD = .21$) participants' Action Prediction averages were significantly below chance (American: $t(31) = -2.40$, $p < .05$; Nepalese: $t(44) = -7.37$, $p < .001$). Thus, when considered a whole, children in both cultures predicted that people would act on social obligation.

To investigate age-related cultural changes, I ran a linear regression with culture, age, and age x culture interaction as the predictors and the average Action Prediction score as the response. The resulting regression lines are shown in Figure 2.3. There was a marginally significant effect of culture, $B = .47$, $SE(B) = .28$, $p = .09$, a significant effect of age, $B = .09$, $SE(B) = .03$, $p < .01$, and a significant age x culture interaction, $B = -.08$, $SE(B) = .04$, $p < .05$.

To investigate the interaction, I ran two follow-up linear regressions, separately for each culture. In each regression, I used Action Prediction score as the response and age as the predictor. For the Nepalese children, age did *not* significantly

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[6] The Free Choice binary regression (Chi-squared (3, N = 75), $p < .05$) as well as the Physical Constraint binary regression (Chi-squared (3, N = 75), $p < .01$) were significant overall; However, the binary regression using Mental Constraint Action Prediction as the responses was non-significant ($p > .15$).

predict Action Prediction scores, *p* > .10. However, for the American children, age positively predicted Action Prediction scores, *B* = .09, *SE(B)* = .03, *p* = .01. Thus, with increasing age, American children were increasingly likely to predict that the characters would act on their desires when those desires conflicted with social obligations. Nepalese children, across all ages, however, predicted instead that characters would act on social obligations. These results thus confirm the idea that there is cultural variation in the prediction that people act on preferences that conflict with social obligations, and that this cultural variation emerges with age.
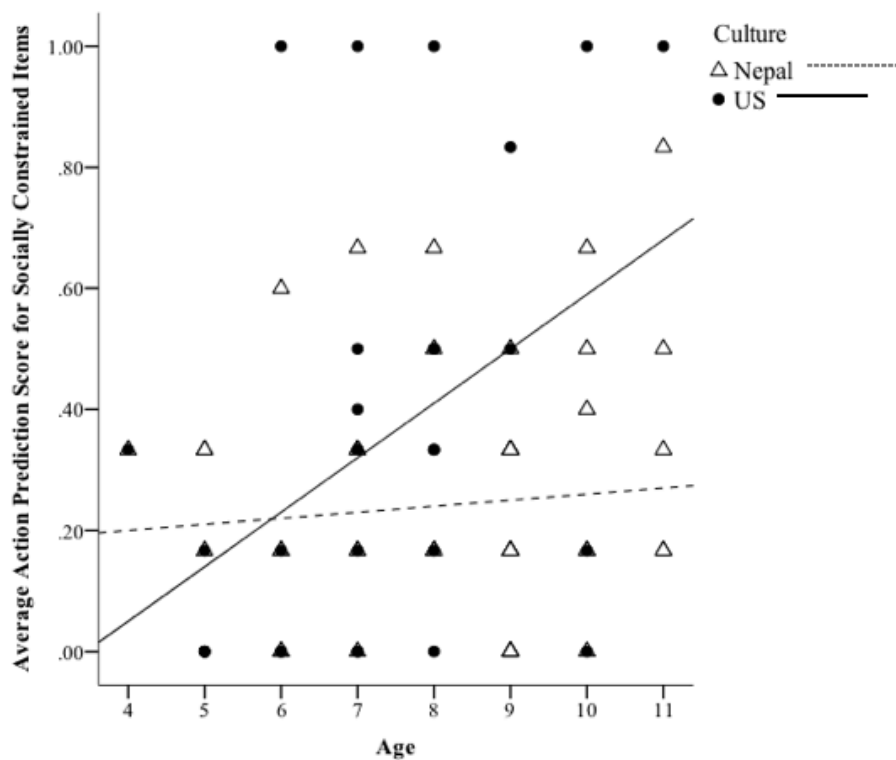
Figure 2.3. Regression Lines for the Action Prediction Means (0-1) of the Socially Constrained Items (Social Norms, Artifact Conventions, Moral Norms, Arbitrary Rules, Justified Rules, and Selfish Acts) vs. Age.

Discussion

The results reveal universal, early-developing intuitions about choice and constraint, as well as important developmental and cultural differences. Across ages, children in both the United States and Nepal endorsed the freedom of choice to perform simple acts (such as drinking milk instead of juice), but recognized that acts that violate physical and mental laws (gravity, object solidity, knowledge limitations) are constrained. This suggests that basic intuitions about freedom of choice and constraint are culturally universal and emerge early.

Importantly, this study also finds evidence for cultural differences and cultural learning in children's concepts of social constraint. With increasing age, American children were increasingly less likely to recognize social constraints as imposing on one's ability to act on basic desires. Nepalese children, on the other hand, continued to view social obligations as constraining choice and action across all ages. These data suggest that social obligations are particularly susceptible to developmental and cultural variation. Interestingly, these results parallel age-related and culture-specific changes in other aspects of children's social cognition, such as causal attribution, self-concept, moral reasoning, and autobiographical memory (Miller, 1984; Wang, 2004). It is also notable that this study observed parallel results for both freedom of choice and action prediction. These results support previous work pointing to early-developing links between children's understanding of desire and action (see Liu et al., 2008; Wellman & Miller, 2006).

It is important to note that beliefs in freedom of choice may be distinguished from the degree to which choice is valued. Prior work finds that Eastern and Western cultures differ in the extent to which they perceive and value choice in everyday contexts (Iyengar & Lepper, 1999; Savani et al., 2010). This experiment, however, looked at explicit endorsements of whether a given action can be chosen at all, not the extent to which one values choice. It remains an important question whether the Nepalese and young American children saw social obligations simply as an influence on one's decisions, or whether they viewed socially-constrained actions as completely outside the arena of choice. However, prior cross-cultural work has found that adults in Eastern cultures endorse the idea that interpersonal actions are freely chosen (Miller et al., 2011), suggesting that rather than failing to construe such actions *as* choices, children believe that social constraints *influence* action.

The unwillingness on the part of very young children across both cultures to endorse freedom of choice (or action) in the face of moral and social constraints is consistent with previous work using a different, first-person, action-based (rather than third-person, story-based) method. In this work, preschool-aged children were unwilling to endorse their own free will to act against moral rules or social norms (Chernyak & Kushnir, in press). These results are also consistent with evidence that children have empathetic, altruistic, cooperative, and normative tendencies early in life (Hoffman, 2000; Killen & Smetana, 2002; Rakoczy, Warneken, & Tomasello, 2008; Warneken & Tomasello, 2008; Zahn-Waxler, Radke-Yarrow, & Chapman, 1992). Taken together, it appears that just as the intuition that we are free to act on desires is intuitive, the intuition that people as constrained by social obligation is also highly

intuitive; both intuitions are thus seen in children at young ages and across cultures. As children age, however, culture and worldview may increasingly serve as guides for moral and social cognition: Western children begin to conceptualize moral and social actions as unique, character-based choices, while Eastern children focus on the benefit to the greater social group (see Miller, 1994). The shift in responses with age (and the subsequent divergence of beliefs across cultures) may represent children's emerging ability to engage in deliberative moral reasoning appropriate to their cultural context.

The cross-cultural differences found also lead to important questions about the specific mechanism through which such differences emerge. Several (non-mutually exclusive) explanations are possible. First, conceptual beliefs in choice and social constraint may be related to how the Nepali and English languages encode ideas about permission and obligation. For example, the English word "can" may denote either ability ("Can you reach that far?") or permission ("Can (May) I have dessert after dinner?"). However, in Nepali, different meanings for "can" are consistently denoted with different words (akin to the less-frequently used distinction in English between "can I" and "may I"). It is possible that such intermixing in English language either leads to, or is reflective of, beliefs that actions that are physically possible are also permissible.

Another explanation concerns differing exposure to rules and standards through one's schooling and home environment. One salient difference between the two cultures may be in the way children spend their structured time. Many of the Nepalese participants lived in communities in which farming, cooking, and fetching water are ordinary family obligations starting from a young age. Structured time, in

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addition to school, is thus spent performing actions that benefit larger social units (families and communities). These lifestyles may be contrasted to the children in the American sample, whose structured time is primarily spent in preschool and elementary schools, which place greater emphasis on individual learning. Although most children do experience social pressure to share, be polite, and be kind, the American children in the subculture sampled rarely engage in instrumental acts for greater societal benefit as part of their daily routine. Culturally varied discussions of these experiences also serve to shape children's sense of self with respect to their social groups. For example, American schoolteachers often stress the importance of "making good choices" with respect to being good to others, while Nepalese schools often stress the importance of "being well disciplined".

Finally, children's observations of adults following and breaking social obligations in favor of personal preferences may exert a similar influence. Future research should address variety of experience such as family, educational, and political background *within* each cultural group, and how individual experience relates to variation in children's concepts of freedom of choice.

Overall, this cross-cultural developmental approach may be a fruitful area for future research. This work adds to the present literature investigating conceptual learning across cultures (Liu et al., 2008; Miller, 1984). In further studying how concepts in young children differ and don't differ across cultures, researchers may study how cultural context provides evidence for children to learn.

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CHAPTER 3

TWO-YEAR-OLDS INHIBIT EXPLORATION TO AVOID HARMING OTHERS

Introduction

Young children are natural learners and are motivated to explore their environments (Bruner, Jolly, & Sylva, 1976). Recent work has shown that such exploratory play emerges early (within the first to second year of life), and is adaptively linked to young children's social and causal learning (Baldwin, Markman, & Melartin, 2008; Cook, Goodman, & Schulz, 2011; Schulz, 2012; Schulz & Bonawitz, 2008). However, at the same time that exploration emerges, so does an increased awareness of rules and social norms, restricting the range of possible exploratory behaviors. To this end, young children begin to develop the self-control to follow rules even in the absence of external monitors (e.g., adults watching; see Bernier, Carlson, & Whipple, 2010; Kochanska, Coy, & Murray, 2001; Kochanska & Knaack, 2004; Kopp, 1982; Zelazo, 2004), which is also adaptively linked to social and cognitive understanding (see Carlson & Moses, 2001; Carlson, Moses, & Breton, 2001). Thus, both exploring the environment and internalizing rules are critical cognitive achievements in the early years.

These two important abilities are often at odds with one another. In non-laboratory settings, children's exploratory play comes at the cost of rule-following behavior. Consider the case of a child wishing to test whether the stove is truly hot, or whether the vase will actually break upon impact with the floor. If children were guided solely by their curiosity, they would fail to acquire norms, rules, and other social precautions normally transferred through adult-directed prohibitions. At the same time, if

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children truly never "tested" the prohibitions provided to them by adults, exploration and self-guided learning would cease as well. How do children learn to make important trade-offs between exploratory play and rule-following behavior? In this paper, I investigate the possibility that the trade-off between rule-following and exploration is importantly influenced by the explanations given for the rules. Specifically, I suggest that adult explanations that reference causal consequences towards others will lead to greater motivation to exhibit rule-following and self-control (and conversely, less exploratory play).

Children's Understanding of Explanations

In investigating this claim, it is important to note that prior work has extensively documented that young children are astute evaluators of adult explanations. For example, preschoolers are known to seek adults for explanations to everyday causal events (Hickling & Wellman, 2001). However, children do not simply accept any and all adult-given explanations, but rather seek for adults to provide causal information pertinent to the child's question (Frazier, Gelman, & Wellman, 2009). Children also prefer that adults provide sensical and domain-appropriate explanations for prohibitions. For example, preschoolers prefer that teachers explain why moral transgressions are wrong with references to harm and victim distress, and social-conventional transgressions with references to classroom disorder (Killen, Breton, Ferguson, & Handler, 1994).

Causal, sensical, and appropriate explanations should therefore be effective in successfully guiding young children's actions. Several lines of indirect evidence support this view. First, work on children's causal learning shows that children explore an object less when given an explanation of "how the toy works" by an adult (Bonawitz et al.,

2011). Children who were given this explanation restricted their exploratory behaviors to those previously shown to them by the knowledgeable adult. Children who watched a seemingly unknowledgeable or interrupted demonstrator, however, did not simply mimic the adult's behaviors, and as a result, explored the toy more and discovered a greater number of its causal functions. Such work points to the potential role of adults' explanations on children's subsequent action production.

A second line of evidence comes from work showing that parents who use inductive techniques are more likely to have compliant children (Brody & Shaffer, 1992; Houck & Lecumeyer-Maus, 2004). Inductive techniques often focus on explaining the causal consequences of children's potential behaviors. Such studies suggest the intriguing possibility of a causal connection between inductive explanations and rule-following behaviors.

Present Study

This work seeks to test directly whether two-year-olds' actions (ability to follow rules) are influenced by the adults' explanations for those rules. In asking this question, I capitalize on two relevant cognitions present by the age of two: young children's emerging prosociality and their causal reasoning. I specifically reasoned that explanations that appeal to these cognitions would be particularly effective in guiding children's behaviors.

Harm-Based Causal Explanations

First, I reasoned that in choosing to follow rules, children may be particularly motivated by explanations that reference causal harm to others. Support for this work comes from the idea that starting from an early age, young children are intrinsically

motivated to be prosocial. By the second to third year of life, children help others complete their goals (Warneken & Tomasello, 2006), share toys (Schmidt & Sommerville, 2008; Svetlova, Nichols, & Brownell, 2010), sympathize with those who are harmed (Vaish, Carpenter, & Tomasello, 2009) or in distress (Zahn-Waxler, Radke-Yarrow, & Wagner, 1992), and punish those who harm others (Dunfield & Kuhlmeier, 2010; Vaish, Missana, & Tomasello, 2011). Such prosocial tendencies appear with limited experience, are intrinsically motivated (Hepach, Vaish, & Tomasello, 2012), and occur in the absence of adult authorities, explicit rules, or external rewards (Warneken & Tomasello, 2008; 2012). Children's internal prosocial motivations may thus be particularly salient and effective in causing children to comply with rules set forth by adults. Explanations for prohibitions that reference harm towards others (e.g., "Don't break your sister's toy because it will make her sad") may elicit prosocial tendencies in children. As a result, these explanations may be effective in causing children to follow rules and inhibit their exploratory behavior.

Non-Harm-Based Causal Explanations

Another potential motivator, however, may be adult causal explanations, with or without reference to another's harm. For example, explaining to children that a given prohibition (e.g., keeping the front door open) has causal consequences (e.g., letting the cold air in) may also be effective in guiding rule-following behavior. By the age of two, children are shown to engage in many forms of rudimentary causal reasoning (e.g., Gopnik, Sobel, Glymour, & Schulz, 2001) about their physical world, and as such, may be receptive to explanations that explain how their rule-breaking behavior may impact their physical surroundings.

Nonsensical Explanations

Such causal explanations may be contrasted with nonsensical, inappropriate, noncausal, or simply nonexistent explanatory statements for rules (e.g., "Don't open the door just because"). As referenced previously, by the preschool age, children reject nonsensical facts and explanations from adults, at least in contexts in which compliance with rules is not at issue (Frazier et al., 2009; Killen et al., 1994; Koenig & Harris, 2005). The study presented here investigates whether even younger children similarly reject nonsensical rules and explanations, especially in the context of exploratory play. Moreover, this study investigates which types of sensible explanations are most effective in causing younger children's rule-following behavior.

Two-year-old children were introduced to an attractive exploratory play object (a toy box) and a prohibition against exploration (a rule that the child was not allowed to open the box). I was interested in how explaining the consequences of exploration would impact children's subsequent exploratory play. In particular, I contrasted children's exploration of the toy box in the face of an explanation that referenced a) a consequence related to harming another (Harm-Causal Explanation: "If you open the box, the other kids will cry") with b) a causal consequence that was harmful to an object (Mechanical-Causal Explanation: "If you open the box, the toys will break"), and c) an explanation that references a harmful consequence to another, but not one that is causally connected to the child's action (Harm-Content Control Explanation: "If the other kids find out the box is orange, they'll cry").

Two related exploratory behaviors were measured: (1) children's ability to *delay exploration* (measured via delay time prior to breaking the rule and opening the box), and

(2) children's ability to *inhibit exploratory behavior* (measured via the amount of time spent exploring the toys inside the box once it was opened).

Children were introduced to a fun toy box (an exploratory play object), and an experimenter informed the child that s/he was not allowed to open it (adult-given prohibition). The experimenter then justified the rule with either an explanation related to psychological harm to others (Harm-Consequence Explanation: "If the other kids find out that you got to open the box, they'll get really sad! They'll probably even cry!"), an explanation that referenced physical harm towards physical objects (Mechanical-Consequence Explanation: "The toys inside the box are really easy to break. So if you open the box, the toys will break!"), or an explanation that nonsensically referenced psychological harm to others ("If the other kinds find out that the box is orange, they'll get really sad!"). The experimenter then left the room for four minutes, leaving the child with the toy box. During this time, children's exploratory behaviors were coded. Since the overall hypothesis was that both causal *and* prosocial factors influence self-control, I hypothesized that children would exhibit less exploratory behavior (exploring the toy box) in response to the Harm-Consequence explanation than the Mechanical-Consequence explanation.

Method

Participants

Thirty-two 2-year-old children (16 females) participated ($M = 25.56$ mo., *range* = 21.96-30.36 mo.). Two children were replaced due to protocol error (the child grabbed the box and opened it before the experiment began, or the experimenter misworded the explanation). Participants were recruited from a small university town. Demographics

data were not collected; however, most participants were of primarily of European-American, middle-class background. Participants were contacted via phone and email, which were obtained through hospital records of birth announcements and flyers posted at nearby preschools.

Procedure

An experimenter led each participant and his/her parent into a room with a table and chairs. In order to limit interaction, each parent was asked to sit directly behind the participant in a separate chair to limit interaction (see Figure 3.1). Additionally, prior to beginning the experiment, each parent was briefed about the study and asked not to instruct his/her child regarding the box. The experimenter placed a piece of paper on one side of the participant and a green wooden box (that was decorated with floral foam stickers on the outside) on the other. The sides of the box and paper were counterbalanced across participants. While doing so, the experimenter explained that she had two games she could play ("I have two games for you today – one game that involves this special box [experimenter then pointed to the box] and another game involves just drawing some shapes [experimenter pointed to a blank piece of paper]"). The experimenter then added that the child was not allowed to open the box today and will have to draw shapes instead.
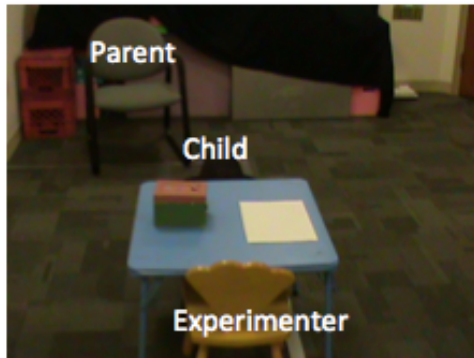
Figure 3.1. Layout of experimental procedure for (a) Experiment 1 and (b) Experiment 2.

Critically, each child was then provided one of two explanations for *why* s/he couldn't open the box, randomly assigned ("The reason why we can't open the special box is…"): Either a **Harm-Consequence Explanation** ("If the other kids find out you got to open the box, the other kids will get really sad! They'll probably even cry!"), or a **Mechanical-Consequence Explanation** ("The toys inside the box are really easy to break. So if you open the box, the toys will break!"). The experimenter then repeated the explanation twice to assure that the child understood, stated that she had to leave in order to get some markers for them to draw with, and left the room. After four minutes, the experimenter returned, and engaged in a brief drawing session with the child.

Coding

Videos were coded using ELAN Coding Software. A hypothesis and condition-blind coder coded all videos, and a second blind coder coded a subset (25%). Average ICC = .96. A separate research assistant transcribed all videos for any parent-child dialogue that took place.

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Participants' actions during the four minutes the experimenter left the room were coded for two exploratory behaviors: a) delay time (in seconds) prior to opening the box, and b) duration of exploratory behavior (also in seconds) defined as time spent touching the toys inside the box (when the box was not open). Finally, videos were coded for c) the number of times children handed the box to the parent. Coding occurred by viewing videotapes frame-by-frame and noting the timestamp (i.e., hitting "Enter") when each instance of a behavior (e.g., touching the toys) occurred and again when the behavior ended.

Results

The primary investigation was whether children would display different patterns of exploratory behavior after hearing a harm-consequence explanation than a mechanical-consequence explanation. The descriptive data of number of children who performed each behavior are included in Table 3.1. An ordinal regression showed that there were no differences in proportion of children who displayed each of the behaviors shown in Table 3.1.

Table 3.1. Descriptive data for number of children displaying each type of behavior in Experiment 1.

	Opened Box = No; Touched Toys = No	Opened Box = Yes; Touched Toys = No	Opened Box = Yes; Touched Toys = Yes
Harm-Consequence	10	2	4
Mechanical-Consequence	8	0	8

To investigate the effect of condition on children's delay time prior to opening the box behavior, I ran a MANCOVA using condition type, gender, age group, and all of the interactions as the predictors, and delay time for the two exploratory behaviors (delay time prior to opening the box, duration of time touching the box and the toys inside) as the response.[7] Age and gender were included as predictors because both age and gender have been found to be associated with delay of gratification and executive function (Kochanska, 2002; Mischel & Ebbesen, 2003; Silverman, 2003). Age group was defined via a median split. All reported tests are two-tailed.

There was an overall main effect of condition, $F(2, 23) = 3.66$, $p < .05$, and a main effect of age group, $F(2,23) = 4.97$, $p < .05$. Gender, and all of the two-way and three-way interaction effects were not significant (all p's $> .05$). Therefore, overall, there were differences in children's exploratory behavior across conditions.

Follow-up analyses showed that there were no differences in delay time prior to opening the box, $p > .15$. However, children in the harm-consequence condition spent longer exploring the box (touching toys inside) than those in the mechanical-consequence condition, $F(1,24) = 5.69$, $p < .05$. This result is shown in Figure 3.2 below.

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[7] Because children who never opened the box were assigned a score of 240, data were skewed, and normality assumptions could not be met. To account for this, I also ran a Kaplan-Meier survival analysis using opening the box as the "event", and delay time prior to opening the box as the time elapsed prior to the "event". There were no significant differences in delay time between conditions for either Experiment 1 or 2. However, results should be interpreted carefully due to low sample size (N = 16 per condition).
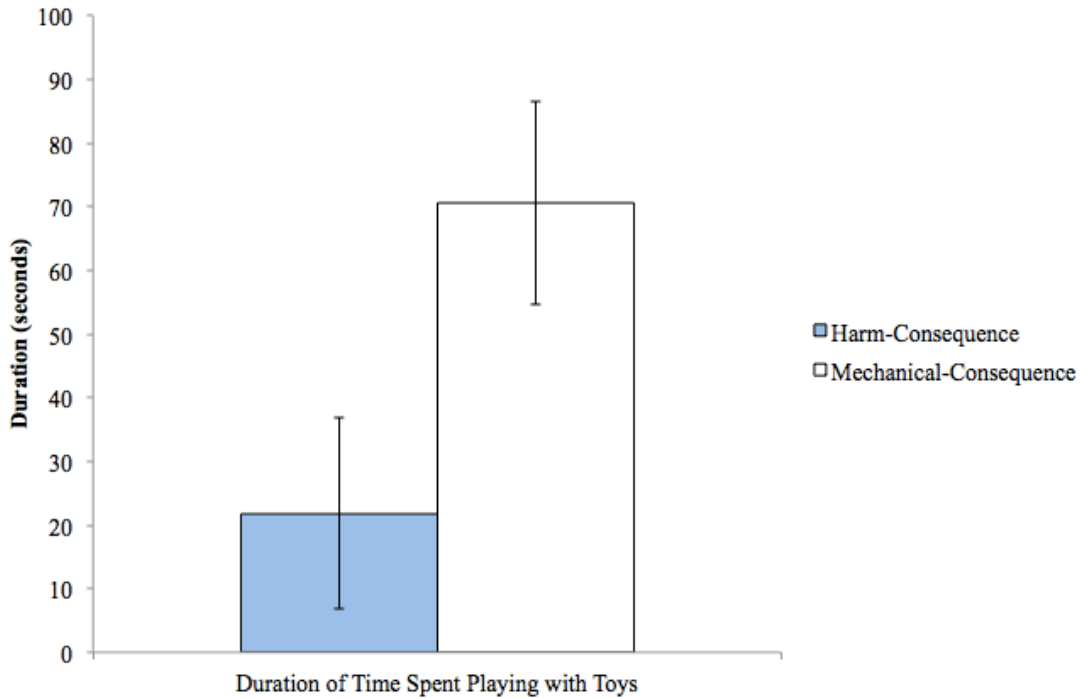
Figure 3.2. Estimated marginal means (bars represent standard errors) for duration of time spent exploring the toys inside the box across conditions in Experiment 1.

The results of Experiment 1 thus show that even after controlling for the effects of age on executive control and compliance, children who heard harm-consequence explanations delayed exploration longer (waited longer to touch the toys inside the box) and explored less than those who heard mechanical-consequence explanations.

Parent-Child Behaviors

All except one parent followed the experimenter's direction, and restricted themselves from instructing their children about the toy box. Independent *t*-tests revealed that there were no differences between conditions in number of parent utterances or child utterances (all *p*'s > .05).

Next, I examined whether children approached their parents with the toy box. Parents are often socially referenced as authority figures in cases of unclear situations (Adolph, Karasik, & Tamis-LeMonda, 2010). In this case, parents would have the ability to help their children in the case of the mechanical consequence (by opening the box carefully or skillfully), but not in the case of the harm consequence. If children infer that they can recruit their parents to help avoid negative consequences, children should attempt to use their parents more in the mechanical-consequence than in the harm-consequence condition. I thus coded for number of times the child brought the box to the parent: children in the mechanical-consequence condition brought the box to parents more often ($M = .38$, $SD = .72$), than those in the harm-consequence condition (in which no child ever brought the box to the parent), $t(30) = -2.09$, $p < .05$.

Experiment 2

The results of Experiment 1 show that children who heard harm-consequence explanations delayed exploration longer than those who heard mechanical-consequence explanations. Moreover, children appropriately referenced their parents when parents could help, suggesting that children were reasoning causally about the potential consequences of their behavior (see also Gweon & Schulz, 2011). In Experiment 2, I sought to resolve two further questions.

First, I asked whether children delay exploration in response to harm explanations that are *direct consequences* of their rule-breaking in contrast to two alternatives. The first alternative explanation suggests that children merely respond to explanations that evoke harm *associated* with the target object. Another alternative possibility is that the word "cry" is more salient to children than the word "break". To investigate these

alternative possibilities, I once again introduced children to a toy box and a prohibition against opening it, but this time added a control condition in which the prohibition was justified with a harm-content explanation ("If the other kids find out the box is orange, they'll cry!"). In this condition, harm was referenced with the target object, but was not a consequence of the child's exploratory behaviors.

Second, I inquired whether the results of Experiment 1 were due to children inferring that parents would help them avoid the negative consequence of the toy breaking. More generally, I also wanted to ensure that parents would not inadvertently interfere in their children's behavior in either condition (harm-consequence or mechanical consequence). Thus, in Experiment 2, parents were positioned facing away from their children, and were given headphones with music so that they were unable to see or hear the experimenter's interaction with the child. This ensured that parents were blind to the explanation their child heard and that children were relatively less able to engage their parents.

Once again, it was predicted that prosocial causal explanations should be more effective in inhibiting exploratory play than non-causal explanations (harm-content). Without appeals for parental help or general parental interference, it was unclear whether other negative causal explanations (the mechanical-consequence condition) would differ from the harm-content explanation. However, if children's motivations are guided by their prosocial tendencies *and* causal understanding, it is likely that non-prosocial negative causal explanations (the mechanical-consequence condition) would inhibit exploratory play more than non-causal explanation, but less than causal explanations that reference prosocial considerations (the harm-consequence condition).

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Method

Participants

Forty-eight 2-year-old children (27 females) participated ($M = 25.32$ mo., *range* = 20.28 mo. – 30.24 mo.). Nine children were replaced: 2 due to protocol error (the experimenter misread the protocol), and 7 due to parental interference (because the parent instructed the child about the toy box). Participant demographics and recruitment followed that of Experiment 1.

Procedure

Procedures were identical to Experiment 1 with the following modifications: First, parents were asked to sit behind and facing away from their children (see Figure 3.1); and were asked to put on headphones with music playing. To further minimize the possibility of parental interference, parents were also given a set of filler questionnaires and asked them to focus on filling them out while their children participated. An orange box with dinosaur and star stickers on the outside was positioned in the center of the table in front of the child.

Children were provided one of three explanations for *why* they couldn't open the box, randomly assigned: **Harm-Consequence Explanation** ("If the other kids find out you got to open this box, they'll get really sad! They're going to cry!"), a **Mechanical-Consequence Explanation** ("The toys inside the box are really easy to break. So if you open the box, the toys will break!"), or a **Harm-Content Control Explanation** ("If the other kids find out this box is orange, they'll get really sad! They're going to cry!"). As in Experiment 1, the experimenter repeated the explanation twice, and then stated that she had to get paper and a marker.

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After four minutes, the experimenter returned, and engaged in a brief drawing session with the child.

Coding

Coding procedures followed those of Experiment 1 (Average ICC = .99). Because parents were unable to engage in dialogue with their children (they faced away from their children and listened to music), parent-child dialogue was not transcribed. Moreover, with parents faced away from their children, and in headphones, only one child ever attempted to bring the box to the parent.

Results

Once again, the primary investigation was whether children would display different patterns of exploratory behavior after hearing a harm-consequence explanation than a mechanical-consequence explanation. The descriptive data of number of children who performed each behavior are included in Table 3.2. An ordinal regression showed that there were no differences in proportion of children who displayed each of the behaviors shown in Table 3.1.

Table 3.2. Descriptive data for number of children displaying each type of behavior in Experiment 2.

	Opened Box = No; Touched Toys = No	Opened Box = Yes; Touched Toys = No	Opened Box = Yes; Touched Toys = Yes
Harm-Consequence	11	1	4
Mechanical-Consequence	10	2	4
Harm-Content Control	6	0	10

To investigate the effect of condition on children's delay time, I once again ran a MANCOVA using condition type, age group, and gender, and all interaction effects as the predictors, and delay time for the two exploratory behaviors (delay time prior to opening the box, duration of time touching the toys inside) as the response. There was once again a significant effect of condition, $F(4,72) = 3.53$, $p < .05$, confirming that overall, children displayed different patterns of behavior across conditions. It was predicted that harm-consequence explanations would elicit the least exploratory play, followed by mechanical-consequence, and then harm-content control explanations. I thus tested directly for a linear trend[8]: Confirming this hypothesis, there was a significant linear trend for duration of time spent exploring the box, *Linear Contrast Estimate* = 25.85, *SE* = 7.08, $p < .01$. The result of this analysis is shown in Figure 3.3 below. There was no linear trend for delay time prior to opening the box, $p > .05$.

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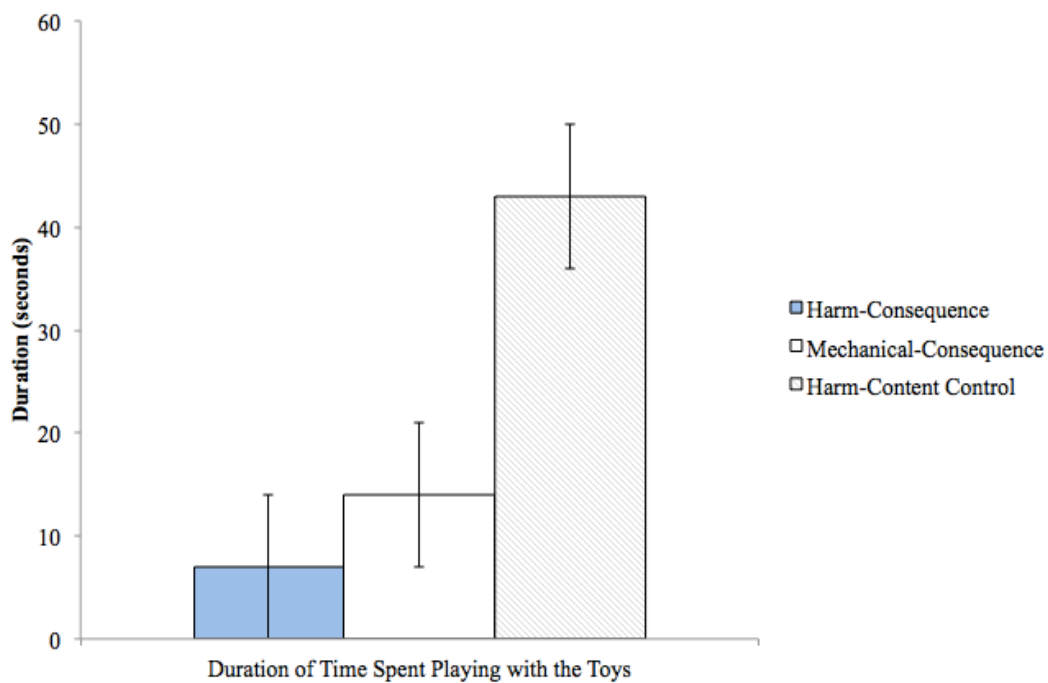
[8] It is worth noting that the a priori hypothesis was one of directionality, not linearity, per se. Data were also tested for, but did not fit, a quadratic trend.

Figure 3.3. Estimated marginal means (bars represent standard errors) for duration of time spent exploring the toys inside the box across conditions in Experiment 2.

The results of Experiment 2 show that children who heard a harm-consequence explanation delayed exploration longer and explored less than those who heard an explanation merely relaying harm content merely relaying the same familiar word "cry". The mechanical-consequence explanation fell in between the two conditions, suggesting that causal explanations elicit some inhibition of exploration, but not as much as harm-consequence causal explanations. These data suggest that in choosing to comply with or reject adult requests, children are motivated by the causal consequences of their potential future actions. Moreover, these results show that 2-year-old children are affected by such causal consequences even when they are unable to reference their parents.

General Discussion

Across two studies, children inhibited their exploratory behaviors in favor of following a rule specifically when that rule evoked harmful social consequences towards others. In Experiment 1, children explored less (and followed rules more) when their exploration evoked harmful consequences towards people than towards objects. In Experiment 2, children explored less when the target exploratory object evoked harmful consequences than when the object was merely associated with harm. These results suggest that young children's exploratory behaviors are guided in part by their causal reasoning and by the prosocial consequences of their behaviors.

Interestingly, children displayed lesser exploratory behavior, but delayed exploration for just as long across all conditions. This suggests that even young children may be predisposed to follow adult rules and regulations. However, once rules are broken (i.e., the box is opened), children continue to monitor and self-regulate their exploratory play when such play may result in potential harm-based consequences.

These findings are congruent with findings suggesting that by the second year of life, children display empathetic, cooperative, and prosocial tendencies towards others (Schmidt & Sommerville, 2012; Svetlova et al., 2010; Warneken & Tomasello, 2006; Zahn-Waxler et al., 1992), as well as self-control and rule-internalization (Kochanska, 2002). The results show that such prosocial tendencies are directly linked to children's self-control.

Importantly, these experiments find that self-control, at least in the context of exploratory play, is powerfully influenced by the social information that children receive (see Kidd, Palmeri, & Aslin, 2013 for a similar demonstration). This social information plays a role even when controlling for standard age differences (Mischel & Ebbesen, 1972), suggesting that social context may serve as an influence in children's emerging ability to exercise self-control.

It is important to further investigate the mechanisms by which children learn to delay in response to causal explanations that reference harm. Harm-consequence explanations may draw on a combination of children's empathic and prosocial tendencies and their causal understanding, both of which develop during the same developmental period targeted in this study. Importantly, as found in Experiment 2,

prosociality is neither elicited solely by mention of harm nor by parental encouragement to self-control. Instead, there are at least two reasons to believe that children engaged in genuine causal reasoning in this task. First, in Experiment 2, children relied on their understanding of the causal link between another children's crying and their own behaviors towards the box, and not simply on their familiarity with harm or with the word "cry". Second, in Experiment 2, when parents were not watching, children inhibited exploration after being given a causal explanation invoking mechanical consequences. This study points to the importance of studying the interaction between emotional and cognitive components of rule-following behavior. Future work may further explore this interaction.

These studies join recent work suggesting that children make important trade-offs during development, and especially during their exploratory play (Bonawitz et al., 2011). Moreover, children appear to use their prosocial tendencies and causal understandings when making choices between rule-following and rule-breaking behavior. This work hints at broader implications for parenting, and future work may explore how parents may elicit children's rule-following behavior through appealing to young children's prosocial and causal understanding.

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CHAPTER 4

GIVING PRESCHOOLERS CHOICE INCREASES SHARING BEHAVIOR

Introduction

 People very rapidly acquire remarkable prosocial tendencies. By the second to third year of life, children help others complete their goals (Warneken & Tomasello, 2006), share toys (Schmidt & Sommerville, 2008; Svetlova, Nichols, & Brownell, 2010), sympathize with those who are harmed (Vaish, Carpenter, & Tomasello, 2009) or are in distress (Zahn-Waxler, Radke-Yarrow, & Wagner, 1992), and punish those who harm others (Dunfield & Kuhlmeier, 2010; Vaish, Carpenter, & Tomasello, 2010; Vaish, Missana, & Tomasello, 2011). How children acquire such tendencies remains an understudied question in present empirical research. Here, I explore the possibility that the ability to make choices encourages young children's prosocial behavior.

 One potential mechanism for the expression of prosocial behavior is through past experience with prosocial action (e.g., Staub, 1971). Work on self-perception theory and the foot-in-the-door effect (see Beaman, Cole, Preston, Klenty, & Steblay, 1983; Bem, 1967; Eisenberg, Cialdini, McCreath, & Shell, 1987; Lepper, 1973) suggests that individuals are likely to act in congruence with their past actions because of a desire to stay self-consistent. Thus, through acting prosocially, children may be forming a cognitive representation of what "the self" is like, and acting in accordance with that representation (Freedman & Fraser, 1966; Grusec, Kuczynski, Rushton, & Simutis 1978; Grusec & Redler, 1980).

Importantly, children evaluate their actions not simply by their occurrence, but also by the contexts under which they occur. In an important study by Warneken and Tomasello (2008), toddlers were given material rewards, social praise, or no rewards at all after performing the target prosocial action of helping an adult obtain an out-of-reach object. Although most children initially helped, only those children who were given no reward at all, or who were given social praise, continued to help the adult at subsequent time points (in the absence of rewards). Children thus used reward as an indicator of how desirable their actions were: children who were materially rewarded inferred that they performed the prosocial behavior solely in order to obtain the reward, whereas those who were not materially rewarded inferred that they performed the prosocial behavior for its own intrinsic purpose (Lepper, Greene, & Nisbett, 1973).

This study explores another important context: choice. Choice, I argue, involves a contrast between a performed action (e.g., sharing a toy) and an alternative action not performed (e.g., not sharing the toy). For example, we evaluate Bob, who voluntarily gave his last $5 to charity but could have kept it for himself (had an alternative) more positively than Jim, who accidentally dropped his last $5 into the hands of a homeless person. In this example, Bob presumably, had an alternative in which he could have kept his $5 for himself. Jim, on the other hand, had no alternative. We also go beyond evaluating choice in absolute terms (having vs. not having choice) and consider the costliness of our chosen actions. To extend the above example, we would consider Bob more generous if his choice was to give away his last $5 than if his choice was to give away $5 out of his $100. Thus, both the presence and the costliness of choice influence how we evaluate others.

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No study to my knowledge has addressed whether choice plays a causal role in young children's prosocial behavior. There is some evidence that by middle childhood, children benefit from having choices in prosocial contexts (Grusec et al., 1978; McGrath, Wilson, & Frasetto, 1995; McGrath & Power, 1990). There are also correlations between the maturity of young children's moral reasoning and their ability to make costly prosocial choices (Eisenberg & Shell, 1986). This finding indicates a potential causal link between costly choices and subsequent moral behavior. Here I ask whether making personally costly choices increases young children's prosociality. Specifically, I hypothesized that the contrast between actions chosen and alternative actions not chosen influences children's behavior above and beyond the prosociality of the actions themselves.

Across two studies, I allowed preschool-aged children (3-4 year-olds) to perform a prosocial action: allocating a limited and desired resource to a puppet that was feeling sad. I systematically manipulated the presence and magnitude of alternative actions. In some cases, the alternative action (keeping the resource for themselves) created a choice that was particularly appealing (i.e., costly). In other cases the alternative action (throwing the resource away) created a choice that was neutral (i.e., non-costly). Finally, in other cases there was no alternative (i.e., no choice), and children were instructed to allocate the resource. I was interested in how the presence of these alternative actions affected children's subsequent prosociality. Subsequent prosociality was measured by allowing children to engage in a new prosocial action towards a different puppet.

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Experiment 1

In Experiment 1, children were presented with an attractive, and limited resource: 1 star sticker that they could give to a puppet ("Doggie") who was described as feeling sad. I manipulated children's experience of choice by allowing children to either make a **Costly Choice** (give the sticker to Doggie instead of keeping it for themselves), **Non-Costly Choice** (give the sticker to Doggie instead of having the experimenter put the sticker away), or **No Choice** (instructed to give the sticker to Doggie). Children's actions towards Doggie were recorded. I then measured subsequent prosociality: all children were introduced to a new puppet ("Ellie") who was also feeling sad, and given three smiley face stickers that they could either keep for themselves or share with Ellie.

Method

Participants

Seventy-two preschool-aged children (*mean:* 3.96 years; *range*: 2.85–4.98) participated. Conditions were fully balanced for age and gender. One child was replaced due to parental interference. Participants were recruited from a local school or children's museum in a small university town. Demographics data was not collected but most participants were of European-American background.

Materials

Materials were two plush puppets ("Doggie" and "Ellie"); three wooden boxes: Doggie's box, Ellie's box (both of which had pictures on the tops and insides of Doggie and Ellie, respectively), and the child's box (no pictures); and a set of star and smiley face stickers. A schematic of materials and procedure is shown in Figure 4.1.

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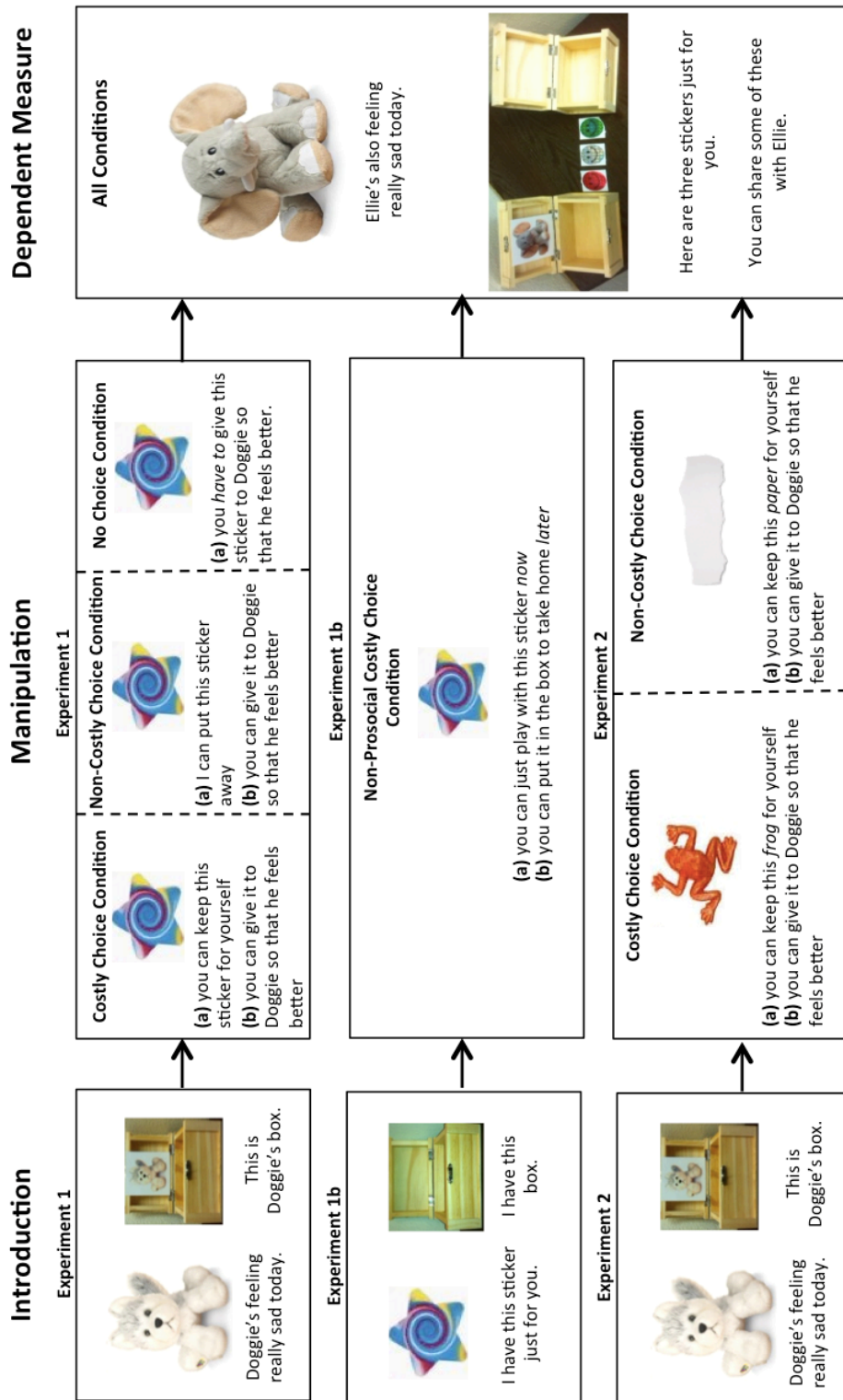
Figure 4.1 Schematic of experiment procedure and materials used.

Procedure

Introduction. Children were shown a plush animal named "Doggie" and told that Doggie was feeling "very sad today". Doggie was then put away. A toy box was placed on the table and introduced as "Doggie's box."

Choice Manipulation. All children were induced to act prosocially. However, I varied the alternative option across conditions. All conditions were presented between-subjects. In the *Costly Choice Condition*, children were presented with the choice of either keeping the sticker for themselves or giving it to Doggie. In the *Non-Costly Choice* condition, children were presented with the choice of putting the sticker away or giving it to Doggie. Finally, in the *No Choice Condition*, the same two alternatives were presented as in the Costly Choice condition ("I'm going to tell you whether you get to keep this sticker for yourself or you have to put it in the box for Doggie so that he feels better"), but children's actions were restricted by experimenter instruction ("This star sticker, you *have* to put in the box for Doggie so that he feels better"). Across all conditions, once children made their final choices, the experimenter said "good job!" and put the toy box away.

Dependent Measure. A new puppet was then shown ("Ellie"), and children were told that Ellie was also feeling sad. Ellie was then put away, Ellie's box was presented along with a second (plain) box on the table, and three smiley-faced stickers placed between the two boxes. The positioning of the two boxes was counterbalanced across participants. The experimenter then said that the three smiley-face stickers were for the child, but that Ellie also really liked them. The number three was chosen to

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force children to create an uneven distribution; that is, children were forced to either to prioritize themselves, or to prioritize Ellie when distributing stickers.

After counting the stickers, the experimenter then said that the child could either keep all of the stickers for him/herself and put them in the plain box, or share some with Ellie and put some in Ellie's box. The experimenter reminded the child whose box was whose, by relabeling the boxes and stating to the child that they could put some stickers in either one. Re-prompts were used if children left any stickers on the table ("and what do you want to do with this/that one?"), until a box was chosen for each sticker.

Coding

All children were videotaped, with the exception of 5 children whose parents did not provide video consent and whose actions were instead transcribed by an assistant. The first author and a condition-blind research assistant coded all videos for the number of stickers given to Ellie. Inter-rater reliability was 100%.

Results and Discussion

Preliminary analyses revealed no effects of age or gender for any of the experiments, so data were collapsed across these variables. All reported tests are two-tailed. I first analyzed children's initial prosocial responses: the overwhelming majority of children chose the prosocial action over the non-prosocial alternative: 19/24 in the Costly Choice condition, 23/24 in the Non-Costly Choice condition, and 23/24 in the No Choice condition. Binomial tests confirmed that the number of children who performed the prosocial action was significantly above chance in each

condition, Binomial p's < .01. Therefore, children were initially motivated to share regardless of condition.

Next, I analyzed children's prosocial actions subsequent to the choice manipulation. Because comparisons across conditions relied critically on children having performed the same initial prosocial action, I looked at data for the children who performed the initial action.

The majority (75%) of children gave at least one sticker to Ellie and kept at least one for themselves, suggesting that children were both motivated to keep stickers and also to share (see Table 4.1 for distributions of stickers given across conditions). Children were divided into two response groups based on whether they distributed unequally in favor of themselves or Ellie: *other-prioritizing* (children who gave the majority of stickers to Ellie) and *self-prioritizing* (children who gave the minority of stickers to Ellie). A higher proportion of children in the Costly Choice condition made an other-prioritizing response than those in the No Choice condition, Fisher's exact test p < .05 (see Figure 4.2), suggesting that having choice influenced children's subsequent sharing.[9] The cost of the choice also affected sharing: a higher proportion of children who made the initial Costly Choice were other-prioritizing than those who made the Non-Costly choice, Fisher's p < .05.

The results of Experiment 1 thus provide initial evidence that having made a costly choice to perform a prosocial action (sharing) increased children's later prosocial behaviors. It remains unclear, however, whether making a costly choice for prosocial reasons, rather than simply a costly choice, affected children's prosocial

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[9] P-values are corrected for multiple comparisons using a sequential Bonferonni correction.

behavior. In choosing to share the sticker, children's responses may have been affected simply by having made the costly choice of inhibiting their own desire to take the sticker. Experiment 1b sought to resolve this question by asking children to make a costly choice (desire inhibition) in a non-prosocial context.

Table 4.1. Number of children who made each sticker allocation type (0, 1, 2, or 3 stickers) towards Ellie across conditions. Modal responses for each condition are underlined.

Number of children making each allocation type towards Ellie		Exp 1: Costly Choice	Exp 1: Non-Costly Choice	Exp 1: No Choice	Exp 1b: Non-Prosocial Costly Choice	Exp 2: Costly Choice	Exp 2: Non-Costly Choice
	0 stickers	1	3	2	1	2	3
	1 sticker	4	**14**	**13**	**14**	5	**13**
	2 stickers	**10**	3	4	4	**11**	5
	3 stickers	4	3	4	4	3	3

Experiment 1b: Non-Prosocial Costly Choice Condition

The procedure largely followed that of Experiment 1. However, instead of being introduced to Doggie, children were simply shown a star sticker and asked to make a choice to either to play with the sticker now or forego playing with it now but get to keep the sticker later. After making the choice, children were shown the new puppet, Ellie, and the rest of experimental procedure followed that of Experiment 1.
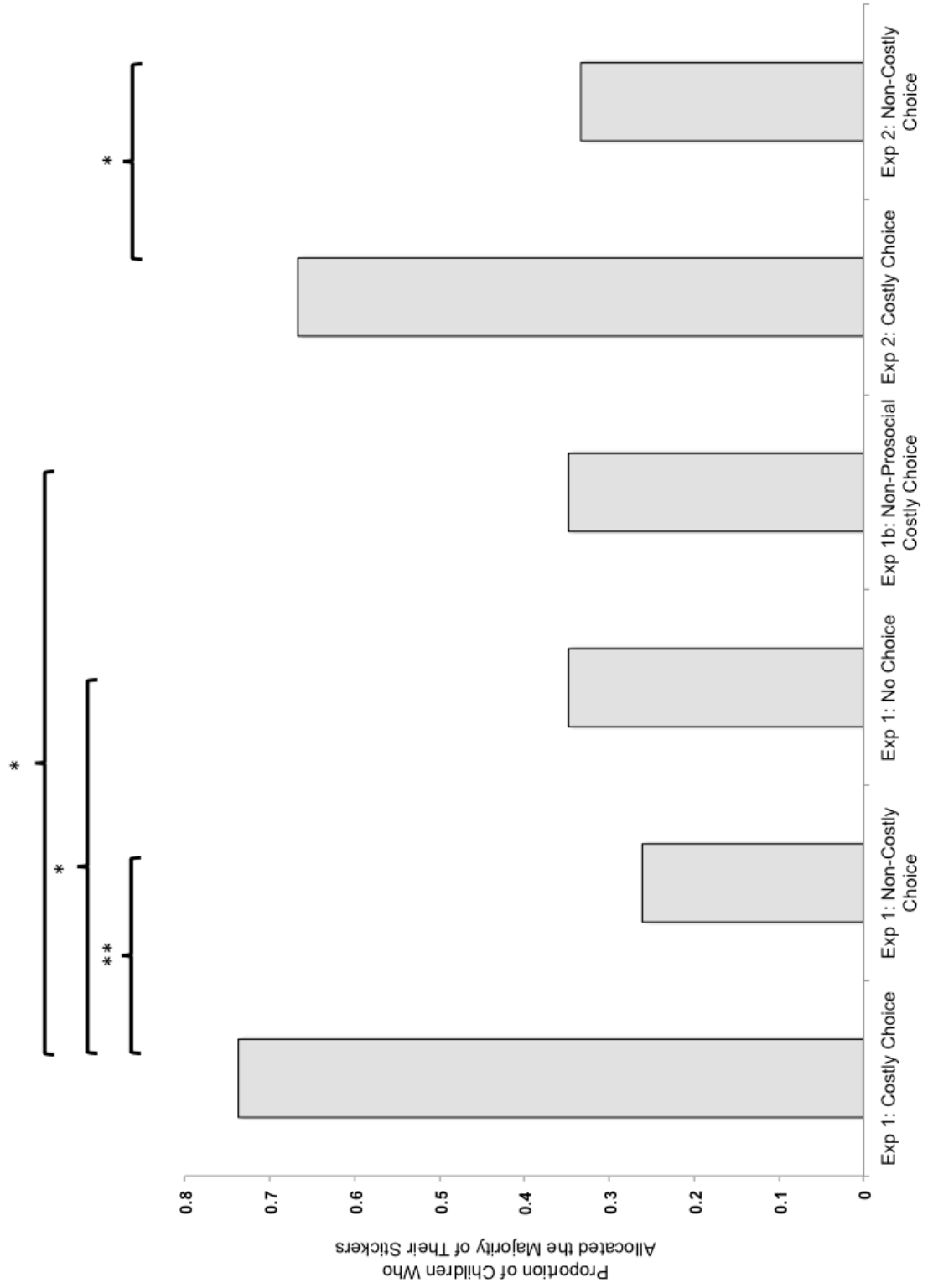
Figure 4.2. Results for all experiments (*, $p < .05$, **, $p < .01$).

Method

Participants

Twenty-four preschool-aged children (*mean:* 3.88 years; *range*: 2.87– 4.98) participated. Once again, I fully balanced age and gender. Participants were recruited from a local school or children's museum in a university town. Demographics data were not collected but participants were of predominantly European-American background. One child was replaced because she did not understand English.

Materials

Materials were identical to those in Experiment 1, but the first puppet (Doggie) was not used.

Procedure

The procedure largely followed that of Experiment 1, with the following modifications: Instead of being introduced to Doggie, children were simply shown a star sticker and then shown a plain wooden box ("I have this star sticker here, and I have this box"). Children were then given a choice to either play with the sticker *now* or place it in the plain wooden box to keep and take home *later* ("You get to choose – you can either just play with the sticker now, or you can put it in the box and get to keep it for later") The dependent measures and new puppet ("Ellie") was the same as in Experiment 1.

Coding

Coding procedures followed those outlined in Experiment 1. Once again, all children were videotaped, with the exception of 2 children whose parents did not provide video consent. Inter-rater reliability was 100%.

Results and Discussion

Almost all of children (23/24) chose the initial target action of placing the sticker in the box, and inhibiting their immediate desire in order to keep the sticker. Binomial tests confirmed that this proportion was significantly above chance, *p* < .001. A significantly smaller proportion of children in Experiment 1b made the other-prioritizing choice than children in the Costly Choice condition of Experiment 1, Fisher's *p* < .05, suggesting that children's sharing behaviors were impacted by initial practice with costly choices in a prosocial context, and not just by the cost of not getting to have the stickers immediately.

The results thus far suggest that making a prosocial choice at a cost to oneself causes children to continue to be prosocial when faced with a new choice. Why might this be the case? One candidate possibility is that, by observing their costly choices, children inferred their own prosociality.

The above explanation is consistent with traditional self-perception theories (Bem 1967; 1972), which predict that people learn about their own preferences by observing their own actions as though they were third-party spectators. There are, however, at least two alternative explanations. One possible explanation is that the initial costly choice led children to believe that they had exhibited their dislike for the object (e.g. "I shared the sticker so I must not like stickers"). Another possibility is that the initial Costly Choice caused children to simply repeat the initial outcome of distributing more to another than to themselves, either as a result of being "primed" with the concept of giving more to others, or due to a desire to stay self-consistent in front of the experimenter (see Eisenberg et al., 1987).

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Experiment 2

Experiment 2 was designed to rule out these possibilities. Procedures mirrored those of Experiment 1's Costly Choice condition, with the following modifications. Children were once again introduced to the first puppet, Doggie. This time, however, in the **Costly Choice condition**, children were given a colorful rubber toy frog, rather than a star sticker. In the **Non-Costly Choice condition**, children were given a small white piece of torn paper. All children were told they could choose to either keep the object for themselves or give it to Doggie. The dependent measure (and the new puppet, Ellie) remained the same.

It is important to note that unlike in Experiment 1, the objects used were different between the choice manipulation (which involved either a frog or piece of paper) and the dependent measure (which again involved smiley face stickers). Thus, any increased tendencies to share stickers during the dependent measure phase could not be attributed to children's inferences about their preference (or lack thereof) for stickers. Additionally, the choice manipulation of both the Costly and Non-Costly Choice conditions of Experiment 2 required children to undertake the same prosocial action of giving an object to Doggie, controlling for the possibility that initial practice with giving objects causes children to simply repeat the outcome of giving more to others than to themselves.

Method

Participants

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Forty-eight preschool-aged children (*mean:* 3.91 years; *range*: 2.81–4.96) participated. I fully balanced age and gender. Participants were recruited from a local school or children's museum in a small university town. Demographics were not collected but the majority of participants were of European-American background. Four children were replaced: 3 due to protocol error (the experimenter did not correctly present the puppets or the boxes), and 1 due to prior participation.

Materials

Materials were identical to those used in Experiment 1, except a set of colorful toy frogs and plain torn pieces of paper (about 1") were used during the introduction instead of star stickers.

Procedure

The procedure largely followed that of Experiment 1, with the following modifications: In the Costly Choice Condition, children were given an attractive object (a colorful toy frog), instead of a star sticker. All children were then told they could either keep it or give it with Doggie. In the Non-Costly Choice condition, children were given a small torn piece of paper and told they could either keep it or give it to Doggie. The dependent measures and the new puppet ("Ellie") was the same as in Experiments 1 and 1b.

Rating Study

In order to make sure that I was justified in the assumption that they toy frog would be a more costly choice than the piece of paper for children, an additional sample of 20 children (*Mean age*: 3.87 years, *range*: 2.84–4.84; 11 female) was shown

the torn paper, and the toy frog, and asked to point to the one they liked more. The positioning of the two objects was counterbalanced.

Coding

Coding procedures followed that of Experiment 1. Inter-rater reliability was 98%.

Results and Discussion

An independent sample of 19/20 children confirmed that they preferred the frog to the paper. These data justify the assumption that giving away the toy frog was a more costly choice than giving away the piece of paper. Once again, almost all of children in both the Costly Choice (frog) condition (21/24) and all of the children in the Non-Costly Choice (paper) condition (24/24) chose the prosocial option (giving the object to Doggie) over the non-prosocial alternative. Binomial tests confirmed that the proportion of children who performed the prosocial action was significantly above chance, p's < .001.

Of those who were initially prosocial, a higher proportion of children in the Costly Choice (frog) condition performed other-prioritizing prosocial behaviors than those in the Non-Costly Choice (paper) condition, Fisher's $p < .05$, demonstrating once again, that costly choices led to greater subsequent sharing behaviors.

Moreover, these data confirm that children's prosociality in Experiment 1 could not be explained by children having made inferences about their own lack of preference for stickers: children in the Costly Choice condition of Experiment 2 shared at nearly the exact same rate as those in the Costly Choice condition of Experiment 1 (74% made the other-prioritizing choice in Experiment 1 vs. 66% in

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Experiment 2; Fisher's exact test *p* > .15). Similarly, this experiment rules out the possibility that children in Experiment 1 simply repeated the outcome of giving objects away; Children in both conditions of Experiment 2 initially gave an object away (and thus had fewer objects than Doggie), but children nonetheless shared at different rates across the two conditions.

General Discussion

I began this paper with the hypothesis that allowing children opportunities to make costly prosocial choices plays an important role in their subsequent prosocial behavior. In fact, children were more prosocial after making costly choices (Experiments 1) than non-costly choices, after making choices in a prosocial context than in a non-prosocial context (Experiment 1b), and after sharing valuable than non-valuable objects (Experiment 2). Together, the results strongly support the idea that even very limited experience making costly choices affects young children's prosociality.

These findings are consistent with self-perception theory (see Cialdini, Eisenberg, Shell, & McCreath, 1987; Grusec et al., 1978): in making costly prosocial choices, children construe their actions as a signal of their prosociality (e.g., "I shared so I must like to share"). The results are also consistent with prior developmental findings that children show longitudinal consistency in the display of high-cost sharing behaviors (Eisenberg et al., 1987; 1999; 2002), and that high-cost prosocial behaviors are systematically correlated with mature moral judgment (Eisenberg & Shell, 1986). I propose that *prosocial construals* may also motivate early prosocial behavior. This *prosocial construal hypothesis* suggests that even before children make

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sophisticated prosocial trait inferences about themselves, they evaluate their actions in the context of non-chosen alternatives. Such evaluations may be one mechanism by which later self-perceptions emerge.

The pattern of results found is particularly notable when considering the competing influences that could have affected children's subsequent prosocial behaviors towards the new puppet. First, making costly choices could have cognitively depleted children and caused them to be *less* likely to perform the prosocial behavior later on (see Muraven & Baumeister, 2000). On a physiological level, children could have been taxed by the initial behavior of giving up an otherwise desired object to the first puppet, and on a cognitive level, children could have felt that they were already prosocial once, and thus did not need to "prove themselves" again (see work on moral self-licensing theory; Merritt, Effron, & Bonin, 2010). This experiment found, however, that this was not the case. Second, children overcame a potential novelty bias: following the costly choice condition of Experiment 2, the majority of children gave most of their stickers to Ellie, despite the fact that stickers were now a novel (and therefore, particularly appealing) object. Children were not simply motivated to do what an adult authority asked them to do: following experimenter instruction in the No Choice condition could have set an implicit social norm (Rakoczy, Warneken, & Tomasello, 2008), or an implication that being prosocial was the "rule". Children in this condition, however, were less prosocial than those in the Costly Choice conditions, in which no potential rule was relayed.   Together, these show that children's initial practice with costly choices was a particularly salient manipulation, even when competing against other potential biases.

Further work may examine the specific features of costly choice situations that enable children's subsequent prosocial behavior. Children may have been affected specifically by the emotional valence of the cost. If this is the case, we might expect children to have experienced greater emotional arousal in performing costly actions. It is also possible that children were subconsciously attuned to their own pride in making a choice that was costly, and were thus motivated to make themselves proud again by being prosocial. Yet another possibility is that in making a costly prosocial choice, children actively self-regulated their own physiological arousal elicited by hearing about a sad puppet (Hepach, Vaish, & Tomasello, 2012). The coordination of setting goals and watching oneself effectively self-regulate in order to meet those goals may then have empowered children to repeat the self-regulatory prosocial behavior later on (Grolnick, 2009). All of these possibilities may inform how children encode and remember costly vs. non-costly choice situations.

The specific nature of the learning process that may occur during costly choice situations is also another important question. It is important to note that prior work has found that children do not show the concept of trait stability until middle childhood (e.g., Eisenberg et al., 1987; Grusec, & Redler, 1980). I therefore posit that it is unlikely that the young children who made costly choices in this study inferred that they had stable dispositional traits (e.g., "I shared so I must be the *type* of person who shares). Rather, children may have made a more subtle inference. Children, instead, may have learning about their own abilities to be prosocial, their own preference to help others, or their own intentions.

These results also have underlying implications for children's moral development (e.g., Eisenberg et al., 1999). It is important for future work to determine the scope of influence that costly choices have on the development of prosocial behavior. Moral self-construction is likely to be the product of a rather complicated process involving emotional, behavioral, and cognitive components (Blasi, 1983; Hardy & Carlo, 2011; Kochanska, 2002). These findings show that costly choices play a causal role in determining the short-term prosocial behavior of very young children. Though more research is needed to investigate how choice interacts with other components of moral development, demonstrating the short-term results underscores previous findings that choice may make a critical contribution to children's emerging understanding of themselves as moral beings.

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CHAPTER 5

CONCLUSION

To return to the idea with which this dissertation began, humans are rapid learners, and within a short developmental timeframe accomplish the rather daunting task of constructing their moral and social worlds. To make sense of the endless array of moral, social, and evaluative information that children are bombarded with, there must be a framework that supports children's ability to form moral judgments, to construct their ideas about what morality is and isn't, and to translate those ideas into their prosocial behavior.

The synthesis of these chapters, as well as my own follow-up work, suggests an intriguing possibility, that I hope will serve as a foundation for further inquiry. I propose that choice – both the understanding of it, and the experience of it – is used as a rational framework by which children are able to make moral inferences. In this Chapter, I will review this framework and its associated predictions, how the framework's predictions are or aren't supported by the empirical data presented, and ideas for ongoing work and future directions.

Choice as a Framework for Rational Inference

To begin, I return to the ideas reiterated in these chapters: that ideas about choice and morality are inherently linked (Nichols & Knobe, 2006; Pizarro & Helzer, 2010; Phillips & Knobe, 2009; Vohs & Schooler, 2008). The empirical investigations suggest that this link occurs early in development, and importantly that choice is a strong elicitor of children's moral judgments and prosocial behaviors. In using choice

as a framework through which children filter moral information, I propose that children compare observed actions (e.g., Bob shared with Mary) with possible alternative actions (e.g., Bob could have kept all the toys for himself) in order to make inferences about moral blame or praise (e.g., Bob likes sharing, so we should reward Bob). In the studies presented in Chapter 4, children learned about their own sharing intentions and abilities through performing actions (sharing) with alternative possibilities (e.g., not sharing).

Importantly, this framework is both qualitative and computational. On the qualitative side, children appear to evaluate not only the presence of alternative actions, but also the *quality* of alternative actions that were available (e.g., "Was the alternative a reasonable one?"). Alternative actions thus provide a context through which to judge the performed action ("Was my action of giving the sticker to the puppy particularly nice if my alternative was to throw it away?"). In support of this view, when alternatives are not appealing or reasonable (e.g. when children donated a sticker, but could alternatively throw it away), children did not appear to form a self-relevant inference about their own prosociality.

On the computational side, the presence of alternatives makes the chosen action (e.g., sharing) statistically less likely to have occurred. Young children make intuitive assumptions about the likelihood of actions (e.g., "How *likely* is was my observed action of choosing a red ball from the box, if the box contained 50% red balls?"; see Xu & Garcia, 2008; Xu & Kushnir, 2013). In an influential study, Kushnir and colleagues (Kushnir, Xu, & Wellman, 2010) found that when children observed actions that were statistically *unlikely* (e.g., Bob pulling out a red ball out of a box

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with only 10% red balls), they made inferences about psychological causes (e.g., Bob must have *really liked* the red ball).

In the moral domain, children may therefore be forming intuitions about the likehood of their own sharing behavior. Specifically, the occurred action is less likely when it is chosen (e.g., "It is unlikely I would have shared if I could have kept this sticker for myself") than when it is not ("It is likely I would have shared if I was instructed to do so"). In the first case, children are thus forced to ascribe a cause for the observed behavior ("Why would I have shared if it was unlikely?"), and the cause is generally a self-relevant inference ("It must be because I like sharing").

This theory makes several important predictions. First, it suggests that the more unlikely an event becomes, the more likely children should be to ascribe its occurrence to an unseen cause. That is, it is *somewhat unlikely* that Bob would donate $20 to charity if he has only $100 in his bank account, *even more unlikely* if he has $50, and *very unlikely* if he has only $20. The more Bob's action of donating to charity violates our predictions of what he'll do, the surer we should be that if Bob shared, it is because he really, really wanted to. In a follow-up study, I found that this was exactly how young children reasoned as well. In a study similar to that presented in Chapter 4, children were given the choice to give an attractive sticker to a puppet who was feeling sad. All of the children chose to give the sticker, but the critical manipulation was how *generous* the action was. One group of children donated the sticker while also being given 3 stickers to keep for themselves (and thus, effectively, donated only 1/4, or 25%, of their total stickers); another group donated the sticker while also being given 2 stickers (and thus donated 33% of their stickers); another

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group was given 1 sticker to keep for themselves (and thus donated 50% stickers), and finally, the last group of children donated a sticker but was given no stickers to keep for themselves (and thus donated 100% of their stickers).

To assess whether children's initial generosity had an impact on their subsequent behavior, I then measured children's subsequent sharing. All children were then introduced to a new puppet and given 3 more stickers that they could split however they wished. I reasoned that children might use the strength of their initial generosity to infer their preference for sharing. If this is the case, they should be the most likely to share altruistically in this dependent measure phase in the 100% (1/1) condition, and the least likely in the 25% (1/4) condition.

This was exactly what happened, and the results are shown in Figure 5.1 below: the more generous the original action, the more likely children were to share altruistically in the dependent measure phase.

As seen in the graph below, initial generosity predicted subsequent generosity in a linear fashion (Linear Contrast $p < .01$).[10] This work is ongoing (Chernyak, Trieu, & Kushnir, in preparation) and supports the idea that children's judgments of choice are made through intuitive computations of likelihood.

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[10] Once again, directionality was predicted a priori, but not linearity, per se. Data, however, followed a linear, not a quadratic, trend.
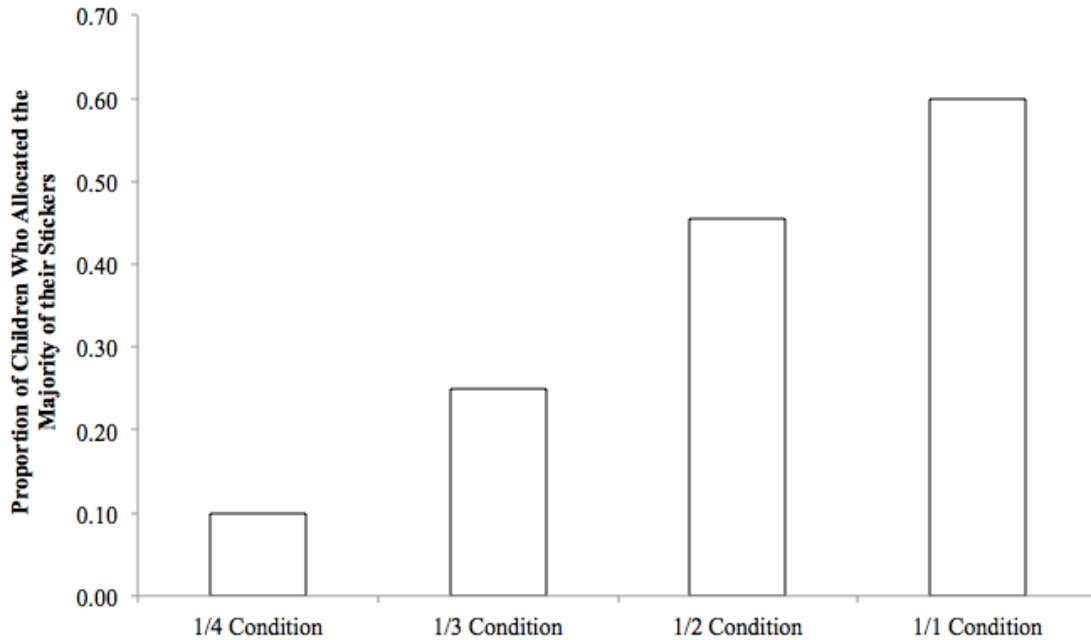
Figure 5.1. Proportion of other-prioritizing responders in the dependent measure phase across conditions.

Thus far I have shown only how children's subsequent behavior is affected by their initial experience of choice and alternative possibility. If children use the experience of choice and alternative possibility as a way of making inferences about themselves, children's self-relevant cognitions should also change after making costly choices. Thus far, I have found some preliminary evidence that children reason differently about their own actions when those actions were costly than when they were not (Chernyak & Kushnir, 2013). However, this is an area that may be fruitful for future research. Further planned work may code for how children explain, remember, encode, and narrative their own costly chosen actions. Another question is whether costly giving situations allow children to form a more cohesive understanding of their self-identity. And finally, one of the most critical questions is how children's

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cognitions following costly choice situations subsequently translate into their behavioral responses (sharing).

Another important prediction is that the use of choice as a means of rational inferences is a domain-general way of reasoning about action and preference. In fact, work by Kushnir and colleagues, as well as my own ongoing work, suggests that children use this framework to infer their own toy preference (Chernyak, Gentilini, & Kushnir, in preparation), the toy preference of others (Kushnir et al., 2010), and the prosociality of others (Chernyak, Yang, & Kushnir, in preparation). Therefore, children use choice to understand action across domains and situations. Moreover, choice is used to understand one's own actions and the observed actions of others.

Cultural Construals of Choice

One important assumption of the choice as a means of rational inference account is that moral actions, in general, must be perceived as choices. That is, if we use choice to make moral evaluations about others, we must also generally believe that moral actions are choices. Interestingly, Chapter 2 would appear to challenge this view by showing that young children across cultures posit that moral actions are *constraints*. Further, children endorse the idea that people neither can nor do act on personal desires when those desires violate a social or moral obligation. At first glance, these data suggest that children use different frameworks for understanding moral actions than do adults (who, at least in our culture, generally endorse the idea that moral actions are freely chosen). I would argue instead that rather than pointing to stark differences between children and adults' views of morality, the data suggest two intriguing conclusions:

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First, children's understanding of moral actions as choices appears to be flexible – that is, subject to situational, cultural, and developmental variability. In support of this view, older American children did judge moral actions to be choices while younger children did not (Chapter 2), suggesting rapid age-related changes during early childhood. Second in my own follow-up work, I have found that children's understanding of actions as choices is easily manipulated by situational context (Chernyak & Kushnir, in press). The preschool age may therefore serve as a critical period during which children form ideas about choice and morality.

Second, these data suggest that there are important cultural differences in how moral actions are viewed. Although ideas about freedom of choice are often stressed as universally critical to moral evaluation, these data suggest instead that culture defines different frameworks for how to judge moral actions. One possibility, and my own intuition on this matter, is that moral actions are viewed as choices across cultures, but that "choice" itself is defined differently across cultures. For example, Eastern cultures often stress the importance of *autonomy*, or the understanding that one may perform actions that are not chosen but that are nonetheless desirable (Bao & Lam, 2008). Consider, for example, being assigned to read your favorite book for a school project. To the American mindset, this action is not chosen, because the book was assigned (rather than selected by you). To the Eastern mindset, however, this action is nonetheless considered *autonomous* because the action reflects what one *would have* desired to do anyway (see also Iyengar & Lepper, 1999). It is possible that Eastern cultures redefine the domain of 'choice' to include actions that happen to be personally desirable. This account might make the prediction that actions that are

considered *autonomous* (i.e., personally desirable) are also ones that are considered

particularly morally blameworthy or praiseworthy.

A second, related possibility is that choice in Western, but not Eastern, cultures

is often defined as the ability to separate one's personal desires from one's obligations.

For example, the statement "You can make the *choice* to help your friend" often

implies the alternative possibility that one may desire and choose not to. Western

cultures might therefore stress the separation between desires and obligations. In

contrast, Eastern cultures may stress an integration between desires and obligations.

Indeed, Eastern participants are more likely than their Western counterparts to judge

that certain duties, such as helping one's friend, are personally desirable (Miller &

Bersoff, 1994). The Eastern participants in my own study may have reasoned that

acting on moral obligations is more desirable than acting on personal preferences. In a

similar vein, young children may also view moral actions as choices *because* such

actions are personally desirable. If either of these possibilities is the case, cultures may

agree on the fact that moral actions are choices, but disagree on the definition of

choice.

Transmissions of Choice

An important remaining question is how concepts of choice become

constructed in the child's mind. Chapter 3 cannot speak directly to this question;

however, the data from Chapter 3 suggest that ideas about morality are transmitted

from adults to children through explanation. Children were asked to follow an

obligation (not open a fun toy box) by inhibiting a desire (to open the toy box). The

experiment was thus set up in a way that automatically separated children's personal

preferences from their obligation to the adult experimenter. Here, adults presented children with either rational reasons to inhibit personal desires (e.g., "other kids will be sad") or irrational ones (e.g., "the box is orange"). This work showed that choosing to act on obligations (defined, in this case, as following the adult mandates) was elicited by rational explanations. Such rational explanations, which appeal to children's moral and causal reasoning, may be a means through which children form ideas that adult-given mandates are important.

Interestingly and importantly, the explanation that elicited the least amount of exploratory play focused on the child as an agent capable of making a choice; children were told that their possible action (opening the box) had a causal consequence on the world. Such explanations may automatically elicit the implication that the child's other possible action (not opening the box) would *not* make the children cry. Whether children simultaneously represent these two possibilities in their minds remains an intriguing question. The harm-consequence explanation ("If you open the box, other kids will cry") may allow children to represent each possible action as a choice with causal consequences (i.e., "if I choose path A and open the box, other children will cry, and if I choose alternate path B, other children will not"). Conversely, the harm-content control would not elicit representing actions as choices because each stated path was not presented in a manner that was causally sensical and was therefore impossible to represent (e.g., "it is unclear what will happen if I choose path A vs. B"). Children's ability to inhibit their own desires in order to follow rules might be predicted by causal reasoning about the consequences of their actions. Therefore, concepts of choice may be subtly transmitted from adults to children through

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explanations that allow children to represent their own multiple possible actions (i.e., choices). Future work may investigate whether this is the case.

Other Accounts of Moral Development

As noted in the introduction of this dissertation, there are many accounts of moral development, and it is important to consider how the choice as rational inference account might challenge and be challenged by these other accounts. The framework proposed is largely agnostic as to whether ideas about choice are innately specified. However, it is important to note that even young infants have some intuitions about actions, intentions, and alternative possibilities (Gergely & Csibra, 2003; Woodward, Sommerville, Gerson, Henderson, & Buresch, 2009)). Moral judgment may therefore stem from the understanding of others as rational, intentional agents. My own ongoing work suggests that at least by the preschool age, moral judgments and prosocial behavior might be selectively targeted towards those whom we believe to be goal-directed, agentive beings (Chernyak & Gary, under review).

These accounts are also agnostic with regard to views that suggest that morality is motivated by emotion and physiology. Emotional cues may serve as motivation for children to behave prosocially or to attend to morally-valent scenarios. Once children do so, however, cognitive factors such as an understanding of choice may allow children to make inferences about moral praise or blame. Another possibility, however, is that emotion disrupts children's abilities to make sophisticated moral judgments.

Finally, an important challenge comes from a body of work in social psychology, which suggests that moral reasoning is not rational or inferential at all

(see Haidt, 2001). This body of work has documented the existence of "moral errors" (Sunstein, 2005). For example, adults' moral judgments are affected by "irrational" processes such as mood (Valdesolo & DeSteno, 2006), personal motivation (Uhlmann, Pizarro, Tenenbaum, & Ditto, 2009), or even story presentation order (Schwitzgebel & Cushman, 2012). There is reason to believe, however, that moral knowledge is constructed rationally, but is easily disrupted by various non-rational processes.

Conclusion

Philosophers, psychologists, modern neuroscientists, and even policy makers have already speculated about the impact of choice on our beliefs about moral punishment and praise, on societal growth, and on human understanding. The studies in this dissertation tap into the underlying processes of how choice and morality become linked together – through cultural learning (Chapter 2), through social transmission (Chapter 3), and prior experience with choice and action (Chapter 4). Each of these studies also adds to the growing body of work suggesting that children show a host of sophisticated moral cognitions and prosocial behaviors. In continuing to focus on how such ideas are transmitted to and embedded in the child's mind, we may be able to one day solve the ages-old question of how moral learning occurs.

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APPENDICES

APPENDIX A: Full List of Questionnaire Items (American Version)

Free Choice Items:

(1) Peter draws a picture every day at home. He **always** uses a pen to make his picture. But today, he wants to do something different. Peter **wants** to make his picture with pencil.

       Choice Question: Can Peter make his picture with pencils today?
          Yes   No

       Prediction Question: What do you think Peter will do today?
          Make his picture with pen   Make his picture with pencils

(2) Susan eats breakfast every morning. She always drinks hot lemon water with her breakfast. But today, she wants to do something different. Susan wants to drink milk tea.

       Choice Question: Can Susan drink milk tea today?
          Yes   No

       Prediction Question: What do you think Susan do today?
          Drink hot lemon water   Drink milk tea

(3) Mary wears shoes outside every day. She always wears her pink shoes. But today, she wants to do something different. Mary wants to wear her blue sandals.

       Choice Question: Can Mary wear her blue sandals?
          Yes   No

       Prediction Question: What do you think Mary will do today?
          Wear her pink shoes   Wear her blue sandals

Physical Constraint Items:

(1) Bobby walks to the store every day. He always walks around the big brick wall. But today, he wants to do something different. Bobby wants to walk right through the big brick wall.

> Choice Question: Can Bobby walk right through the wall?
> Yes   No
>
> Prediction Question: What do you think Bobby will do today?
> Walk around the wall   Walk through the wall

(2) Karen is little girl and she is still growing every year. She always grows a little bit every year. But this year, she wants to do something different. Karen wants to stop growing and never grow again.

> Choice Question: Can Karen stop growing this year?
> Yes   No
>
> Prediction Question: What do you think Karen will do this year?
> Karen will grow a little bit   Karen won't grow at all

(3) Bonnie jumps up and down on the playground every day. She always jumps and comes back down. But today, Bonnie wants to do something different. Bonnie **wants** to float in the air and never come back down.

> Choice Question: Can Bonnie float in the air and never come back down?
> Yes   No
>
> Prediction Question: What do you think Bonnie will do today?
> Jump up and come back down   Float in the air

Mental Constraint Items:

(1) Andrew draws pictures every day. He always draws a picture of a dog. But today, Andrew wants to do something different. Andrew wants draw a monkey even though he's never seen one before. But, Andrew has never seen a monkey before. He doesn't know what a monkey looks like.

Choice Question: Can Andrew draw a monkey even though he's never seen one before?

    Yes   No

Prediction Question: What do you think Andrew will do today?

    Draw something he's seen before   Draw a monkey

(2) Sally rides her bicycle every day. Sally has no idea how to fix her bicycle. Sally always asks other people to help her fix things she doesn't know how to fix. But today, Sally wants to do something different. Sally wants to fix her bicycle even though she doesn't know how.

Choice Question: Can Sally fix her bicycle even though she doesn't know how?

    Yes   No

Prediction Question: Which do you think Sally will do today?

    Ask someone to help her fix her bicycle   Fix her bicycle all by herself

(3) Kyle and his friend live far away. Kyle always asks his friend what he ate for lunch that today. But today, Kyle wants to do something different. He wants to know what his friend ate for lunch without asking.

Choice Question: Can Kyle know what his friend ate for lunch without asking?

    Yes   No

Prediction Question: What do you think Kyle will do today?

    Ask his friend what he ate for lunch   Know what he ate for lunch without asking

Social Convention Items:

(1) Gary puts on his clothes every day before he goes outside. He always puts on a shirt and pants. But today, Gary wants to do something different. Gary wants to wear his sister's dress today.

Choice Question: Can Gary wear his sister's dress?

Yes   No

      Prediction Question: What do you think Gary will do today?
           Wear a shirt and pants   Wear his sister's dress

(2) David is a little boy. He always eats dinner with his family. But today, David wants to do something different. David wants to eat dinner alone.

      Choice Question: Can David eat dinner alone?
      Yes   No

      Prediction Question: What do you think David will do today?
           Eat dinner with his family   Eat dinner alone

(3) Annie has guests over to her house every day. She always greets her guests by saying "hello". But today, Annie wants to do something different. Annie wants to say nothing when she sees her guests.

      Choice Question: Can Annie say nothing when her guests come?
      Yes   No

      Prediction Question: What do you think Annie will do today?
           Say "namaste" to her guests   Say nothing to her guests

Artifact Convention Items:

(1) Miranda eats dinner every day. She always uses a fork to eat her dinner. But today, Miranda wants to do something different. Miranda wants to eat dinner using her feet.

      Choice Question: Can Miranda eat dinner using her feet?
      Yes   No

      Prediction Question: What do you think Miranda will do today?
           Eat with a fork   Eat with her feet

(2) Ross buys groceries every week. He always carriers his groceries in a bag. But today, Ross wants to do something different. David wants to carry his groceries in a fish net.

Choice Question: Can Ross carry his groceries in a fishnet?
    Yes   No

Prediction Question: What do you think Ross will do this week?
    Carry his groceries in a bag   Carry his groceries in a fishnet

(3) It is raining in Ben's town today. He always uses an umbrella when it rains. But today, Ben wants to do something different. Ben wants to use a bucket when it rains.

Choice Question: Can Ben use a bucket when it rains?
    Yes   No

Prediction Question: What do you think Ben will do today?
    Use an umbrella   Use a bucket

Moral Convention Items:

(1) Johnny sees his friends every day. He always plays with his friends nicely. But today, Johnny wants to do something different. Johnny wants to hit his friends.

Choice Question: Can Johnny hit his friends today?
    Yes   No

Prediction Question: What do you think Johnny will do today?
    Play nicely   Hit his friends

(2) Pat sees his friend every day. Pat always tells his friend something nice. But today, Pat wants to do something different. Pat wants to say something that will make his friend cry.

Choice Question: Can Pat say something that will make his friend cry?
    Yes   No

Prediction Question: What do you think Pat will do today?
    Say something nice   Say something that will make his friend cry

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(3) Rory's mom gives Rory some candies to split between her brother and herself. Rory always gives half the candy to her brother, and takes half of them for herself. But today, Rory wants to do something different. Rory wants to steal all of the candies for herself.

>Choice Question: Can Rory steal all of the candies for herself?
>Yes   No

>Prediction Question: What do you think Rory will do today?

>Split the candy with her brother   Steal all of the candy for herself

Unjustified Rule Items:

(1) Dina's mom tells her that she has to sit on the green chair during dinner. Dina always listens to her mom and sits in the green chair. But today, Dina wants to do something different. Dina wants to sit on the red chair

>Choice Question: Can Dina sit in the red chair?
>Yes   No

>Prediction Question: What do you think Dina will do today?
>Sit on the green chair   Sit on the red chair

(2) Rina's town says you have to wear the color blue. Rina always listens to the town rule and wears blue clothing. But today, Rina wants to do something different. Rina wants to wear yellow clothing.

>Choice Question: Can Rina wear yellow clothing?
>Yes   No

>Prediction Question: What do you think Rina will do today?

>Wear blue clothing   Wear yellow clothing

(3) Louis's father always tells him to play with his blocks. Louis always listens to his father and plays with his blocks. But today, Louis wants to do something different. Louis wants to play with his ball and paddle.

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Choice Question: Can Louis play with his ball and paddle?
        Yes   No

Prediction Question: What do you think Louis will do today?

        Play with his blocks   Play with his ball and paddle

Justified Rule Items:

(1) Isaac's parents don't like him to play outside when it's dark because it's too dangerous and Isaac might get hurt. Isaac always stays indoors when it's dark. But today, Isaac wants to do something different. Isaac wants to play outside in the dark.

        Choice Question: Can Isaac play outside in the dark?
        Yes   No

        Prediction Question: What do you think Isaac will do tonight?
        Stay indoors   Play outside

(2) Noah's town has a rule that says you're not allowed to go outside without a hat because it's cold and Noah might get sick. Noah always wears a hat outside. But today, Noah wants to do something different. Noah wants to go outside without a hat.

        Choice Question: Can Noah go outside without a hat?
        Yes   No

        Prediction Question: What do you think Noah will do today?

        Wear his hat   Go outside without a hat

(3) Polly's parents tell her not to lift her little sister because she's too heavy for Polly and Polly might get hurt. Polly always listens to her parents and doesn't lift her little sister. But today, Polly wants to do something different. Polly wants to lift her little sister.

        Choice Question: Can Polly lift her little sister?
        Yes   No

Prediction Question: What do you think Polly will do today?

Not lift her little sister   Lift her little sister

Selfish Act Items:

(1) Timmy eats lunch with his friends. Timmy always helps his friends clean the table after they are done eating. But today, Timmy wants to do something different. Timmy wants to go play outside and not help his friends clean the table.

Choice Question: Can Timmy play outside instead of helping his friends clean up?
Yes   No

Prediction Question: What do you think Timmy will do after eating?
Clean up   Play outside

(2) Jessica passes a bucket of free toys every day. Usually, Jessica takes some toys and shares them with her friends. But today, Jessica wants to do something different. Jessica wants to take all of the toys for herself.

Choice Question: Can Jessica take all of the toys for herself?
Yes   No

Prediction Question: What do you think Jessica will do with the toys?
Share them with her friends   Keep them for herself

(3) Sarah helps her older sister every morning. Sarah cooks the breakfast while her older sister helps her younger brothers get ready for school. But today, Sarah wants to do something different. Sarah wants to sleep in and not help her sister cook breakfast.

Choice Question: Can Sarah sleep in and not help her older sister cook breakfast?
Yes   No

Prediction Question: What do you think Sarah will do today?

Sleep in   Help her older sister cook breakfast

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APPENDIX B: Full List of Questionnaire Items (Nepalese Version)

Free Choice Items:

(4) Kamal draws a picture every day at home. He always uses a pen to make his picture. But today, he wants to do something different. Kamal wants to make his picture with pencil.

> Choice Question: Can Kamal make his picture with pencils today?
> Yes   No

> Prediction Question: What do you think Kamal will do today?
> Make his picture with pen   Make his picture with pencils

(5) Rama eats breakfast every morning. She always drinks hot lemon water with her breakfast. But today, she wants to do something different. Rama wants to drink milk tea.

> Choice Question: Can Rama drink milk tea today?
> Yes   No

> Prediction Question: What do you think Rama will do today?
> Drink hot lemon water   Drink milk tea

(6) Ramita wears shoes outside every day. She always wears her pink shoes. But today, she wants to do something different. Ramita wants to wear her blue sandals.

> Choice Question: Can Ramita wear her blue sandals?
> Yes   No

> Prediction Question: What do you think Ramita will do today?
> Wear her pink shoes   Wear her blue sandals

Physical Constraint Items:

(4) Ram walks to the store every day. He always walks around the big brick wall. But today, he wants to do something different. Ram wants to walk right through the big brick wall.

Choice Question: Can Ram walk right through the wall?
        Yes   No

Prediction Question: What do you think Ram will do today?
        Walk around the wall   Walk through the wall

(5) Radhika is little girl and she is still growing every year. She always grows a little bit every year. But this year, she wants to do something different. Radhika wants to stop growing and never grow again.

Choice Question: Can Radhika stop growing this year?
        Yes   No

Prediction Question: What do you think Radhika will do this year?
        Radhika will grow a little bit   Radhika won't grow at all

(6) Rita jumps up and down on the playground every day. She always jumps and comes back down. But today, Rita wants to do something different. Bonnie wants to float in the air and never come back down.

Choice Question: Can Rita float in the air and never come back down?
        Yes   No

Prediction Question: What do you think Rita will do today?
        Jump up and come back down   Float in the air

Mental Constraint Items:

(1) Shyam draws pictures every day. He always draws a picture of a dog. But today, Shyam wants to do something different. Shyam wants draw a monkey even though he's never seen one before. But, Shyam has never seen a monkey before. He doesn't know what a monkey looks like.

Choice Question: Can Shyam draw a monkey even though he's never seen one before?
        Yes   No

Prediction Question: What do you think Shyam will do today?

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Draw something he's seen before   Draw a monkey

(2) Hari rides his bicycle every day. Hari has no idea how to fix his bicycle. Hari always asks other people to help him fix things she doesn't know how to fix. But today, Hari wants to do something different. Hari wants to fix his bicycle even though she doesn't know how.

    Choice Question: Can Hari fix his bicycle even though she doesn't know how?
        Yes   No

    Prediction Question: Which do you think Hari will do today?
        Ask someone to help his fix her bicycle   Fix his bicycle all by himself

(3) Jyothi and her friend live far away. Jyothi always asks her friend what she ate for lunch that today. But today, Jyothi wants to do something different. She wants to know what her friend ate for lunch without asking.

    Choice Question: Can Jyothi know what her friend ate for lunch without asking?
        Yes   No

    Prediction Question: What do you think Jyothi will do today?
    Ask his friend what she ate for lunch   Know what she ate for lunch without asking

Social Convention Items:

(4) Ravi puts on his clothes every day before he goes outside. He always puts on a shirt and pants. But today, Ravi wants to do something different. Ravi wants to wear his sister's dress today.

    Choice Question: Can Ravi wear his sister's dress?
        Yes   No

    Prediction Question: What do you think Ravi will do today?
        Wear a shirt and pants   Wear his sister's dress

(5) Krishna is a little boy. He always eats dinner with his family. But today, Krishna wants to do something different. Krishna wants to eat dinner alone.

       Choice Question: Can Krishna eat dinner alone?
           Yes   No

       Prediction Question: What do you think Krishna will do today?
           Eat dinner with his family   Eat dinner alone

(6) Rita has guests over to her house every day. She always greets her guests by saying "namaste". But today, Rita wants to do something different. Rita wants to say nothing when she sees her guests.

       Choice Question: Can Rita say nothing when her guests come?
           Yes   No

       Prediction Question: What do you think Rita will do today?
           Say "namaste" to her guests   Say nothing to her guests

Artifact Convention Items:

(1) Rabindra eats dinner every day. She always uses her hands to eat her dinner. But today, Rabindra wants to do something different. Rabindra wants to eat dinner using her feet.

       Choice Question: Can Rabindra eat dinner using her feet?
           Yes   No

       Prediction Question: What do you think Rabindra will do today?
           Eat with her hands   Eat with her feet

(2) Kavita buys groceries every week. She always carriers her groceries in a bag. But today, Kavita wants to do something different. Kavita wants to carry her groceries in a fish net.

       Choice Question: Can Kavita carry her groceries in a fishnet?
           Yes   No

       Prediction Question: What do you think Kavita will do this week?

Carry her groceries in a bag   Carry her groceries in a fishnet

(3) It is raining in Til Badhur's village today. He always uses an umbrella when it rains. But today, Til Badhur wants to do something different. Til Badhur wants to use a bucket when it rains.

       Choice Question: Can Til Badhur use a bucket when it rains?
       Yes   No

       Prediction Question: What do you think Til Badhur will do today?
       Use an umbrella   Use a bucket

Moral Convention Items:

(1) Bishnu sees his friends every day. He always plays with his friends nicely. But today, Bishnu wants to do something different. Bishnu wants to hit his friends.

       Choice Question: Can Bishnu hit his friends today?
       Yes   No

       Prediction Question: What do you think Bishnu will do today?
       Play nicely   Hit his friends

(2) Anita sees her friend every day. Anita always tells her friend something nice. But today, Anita wants to do something different. Anita wants to say something that will make her friend cry.

       Choice Question: Can Anita say something that will make her friend cry?
       Yes   No

       Prediction Question: What do you think Anita will do today?
       Say something nice   Say something that will make her friend cry

(3) Purna's mom gives Purna some candies to split between her brother and herself. Purna always gives half the candy to her brother, and takes half of

them for herself. But today, Purna wants to do something different. Purna wants to steal all of the candies for herself.

Choice Question: Can Purna steal all of the candies for herself?
Yes   No

Prediction Question: What do you think Purna will do today?

Split the candy with her brother   Steal all of the candy for herself

Unjustified Rule Items:

(4) Kopila's mom tells her that she has to sit in the straw mat during dinner. Kopila always listens to her mom and sits in the straw mat. But today, Kopila wants to do something different. Kopila wants to sit in the red chhakati (cushion).

Choice Question: Can Kopila sit in the red chhakati?
Yes   No

Prediction Question: What do you think Kopila will do today?
Sit on the straw mat   Sit on the red chhakati

(5) Sita's town says you have to wear the color blue. Sita always listens to the town rule and wears blue clothing. But today, Sita wants to do something different. Sita wants to wear yellow clothing.

Choice Question: Can Sita wear yellow clothing?
Yes   No

Prediction Question: What do you think Sita will do today?

Wear blue clothing   Wear yellow clothing

(6) Raj's father always tells him to play with his marbles. Raj always listens to his father and plays with his marbles. But today, Raj wants to do something different. Raj wants to play with a ball.

Choice Question: Can Raj play with a ball?
Yes   No

Prediction Question: What do you think Raj will do today?

Play with his marbles   Play with a ball

Justified Rule Items:

(4) Bikram's parents don't like him to play outside when it's dark because it's too dangerous and Bikram might get hurt. Bikram always stays indoors when it's dark. But today, Bikram wants to do something different. Bikram wants to play outside in the dark.

        Choice Question: Can Bikram play outside in the dark?
        Yes   No

        Prediction Question: What do you think Bikram will do tonight?
        Stay indoors   Play outside

(5) Sabina's town has a rule that says you're not allowed to go outside without a hat because it's cold and Sabina might get sick. Sabina always wears a hat outside. But today, Sabina wants to do something different. Sabina wants to go outside without a hat.

        Choice Question: Can Sabina go outside without a hat?
        Yes   No

        Prediction Question: What do you think Sabina will do today?

        Wear her hat   Go outside without a hat

(6) Samita's parents tell her not to lift her little sister because she's too heavy for Samita and Samita might get hurt. Samita always listens to her parents and doesn't lift her little sister. But today, Samita wants to do something different. Samita wants to lift her little sister.

        Choice Question: Can Samita lift her little sister?
        Yes   No

        Prediction Question: What do you think Samita will do today?

        Not lift her little sister   Lift her little sister

Selfish Act Items:

(4) Atma eats lunch with his friends. Atma always helps his friends clean the table after they are done eating. But today, Atma wants to do something different. Atma wants to go play outside and not help his friends clean the table.

　　　　Choice Question: Can Atma play outside instead of helping his friends clean up?
　　　　　　Yes　　　　　　　　　　　　No

　　　　Prediction Question: What do you think Atma will do after eating?
　　　　　　Clean up　　　　　　　　　　　　Play outside

(5) Sarita passes a bucket of free toys every day. Usually, Sarita takes some toys and shares them with her friends. But today, Sarita wants to do something different. Sarita wants to take all of the toys for herself.

　　　　Choice Question: Can Sarita take all of the toys for herself?
　　　　　　Yes　　　　　　　　　　　　No

　　　　Prediction Question: What do you think Sarita will do with the toys?
　　　　　　Share them with her friends　　　　Keep them for herself

(6) Sadiksya helps her older sister every morning. Sadiksya cooks the breakfast while her older sister helps her younger brothers get ready for school. But today, Sadiksya wants to do something different. Sadiksya wants to sleep in and not help her sister cook breakfast.

　　　　Choice Question: Can Sadiksya sleep in and not help her older sister cook breakfast?
　　　　　　Yes　　　　　　　　　　　　No

　　　　Prediction Question: What do you think Sadiksya will do today?

　　　　　　Sleep in　　　　　　Help her older sister cook breakfast

APPENDIX C: Means (Standard Deviations in parentheses) of Free Choice Judgments Within Each Culture and Age Group

	Nepal	United States
4 years	1 (0)	.50 (0)
5 years	.33 (0)	.07 (.10)
6 years	.40 (.19)	.29 (.48)
7 years	.48 (.33)	.54 (.39)
8 years	.37 (.27)	.55 (.37)
9 years	.33 (.20)	.83 (0)
10 years	.36 (.29)	.67 (.58)
11 years	.43 (.28)	1.0 (0)

APPENDIX D: Means (Standard Deviations in parentheses) of Action Predictions Within Each Culture and Age Group

	Nepal	United States
4 years	.33 (0)	.33 (0)
5 years	.28 (.10)	.03 (.07)
6 years	.19 (.25)	.29 (.48)
7 years	.29 (.21)	.34 (.32)
8 years	.33 (.24)	.40 (.32)
9 years	.19 (.25)	.66 (.24)
10 years	.32 (.25)	.39 (.54)
11 years	.40 (.28)	1.0 (0)

APPENDIX E: Binary Logistic Regression Results for the Free Choice Judgment for Each Socially Constrained Item

	Culture B (SE(B))	Age B (SE(B))	Age X Culture B (SE(B))
Social Conventions	.24 (2.34)	.16 (.18)	.11 (.29)
Artifact Conventions[a]	-.09 (.18)	-3.71 (2.48)	.64 (.32)*
Moral Conventions[a]	-8.31 (2.87)**	-.32 (.18)	1.09 (.37)**
Unjustified Rules	-.18 (.18)	-4.56 (2.33)*	.59 (.30)
Justified Rules[a]	-6.10 (2.80)*	-.27 (.19)	.91 (.36)*
Selfish Acts[a]	-9.14 (4.14)*	.08 (.17)	1.28 (.57)

Note: For culture, the Nepal group is used as the reference variable.
* Significant predictors are marked by asterisks (*, $p < .05$; **, $p < .01$).
[a] Superscript indicates that overall regression was significant at the $p < .05$ level.

APPENDIX F: Binary Logistic Regression Results for the Action Prediction Score for Each Socially Constrained Item

	Culture B (SE(B))	Age B (SE(B))	Age X Culture B (SE(B))
Social Conventions	2.32 (2.65)	.35 (.22)	-.20 (.32)
Artifact Conventions[a]	-2.40 (3.51)	.21 (.28)	.52 (.42)
Moral Conventions	-3.06 (3.01)	.15 (.21)	.46 (.37)
Unjustified Rules	-3.43 (2.24)	-.05 (.17)	.42 (.29)
Justified Rules	-3.72 (2.98)	-.21 (.24)	.59 (.38)
Selfish Acts	-3.42 (2.79)	.08 (.18)	.51 (.36)

Note: For culture, the Nepal group is used as the reference variable.
* Significant predictors are marked by asterisks (*, $p < .05$; **, $p < .01$).
[a] Superscript indicates that overall regression was significant at the $p < .05$ level.