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The developmental and cultural psychology of free will

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Abstract

This paper provides an account of the developmental origins of our belief in free will based on research from a range of ages—infants, preschoolers, older children, and adults—and across cultures. The foundations of free will beliefs are in infants' understanding of intentional action—their ability to use context to infer when agents are free to “do otherwise” and when they are constrained. In early childhood, new knowledge about *causes* of action leads to new abilities to imagine *constraints* on action. Moreover, unlike adults, young children tend to view psychological causes (i.e., desires) and social causes (i.e., following rules or group norms, being kind or fair) of action as constraints on free will. But these beliefs change, and also diverge across cultures, corresponding to differences between Eastern and Western philosophies of mind, self, and action. Finally, new evidence shows developmentally early, culturally dependent links between free will beliefs and behavior, in particular when choice-making requires self-control.

1 | INTRODUCTION

In a recent interview, Katherine Switzer, the first woman to run the Boston Marathon wearing an official bib, was asked to talk about the experience, including the moment when the race director, seeing that she was female, tried to forcibly remove her from the course. In her reflection, Switzer began by describing the personal significance of the event: her own simple desire to run—“I wasn't trying to prove anything, I was just so proud of the fact that I knew I could do it.” However, when she described the decision to finish the race after being violently pulled off the course by the race director, her narrative changed from a story of personal accomplishment to an event with social

significance: "I was determined to finish. I wanted to prove that I could do it and that women everywhere could do it and should be allowed to do it." And she continued,

I realized women just needed opportunities; that they didn't believe in themselves ... that they believed the myths that surrounded arduous sports for women, and they were going to be forever limited by their capability—uh, or their belief in their lack of capability, rather—if they didn't have an opportunity to try otherwise. (AMR podcast, Episode #256, 26:00–27:30)

Switzer's words perfectly capture what many psychologists take to be the essential components of our folk intuitions of free will—that is, that it involves our *intentions* ("I was determined to finish") combined with beliefs about *possibility*. The latter include beliefs in our ability to act ("I knew I could do it"; e.g., Wegner, 2002; Ryan & Deci, 2000), the many constraints on actions ("they believed the myths"; e.g., Dweck & Molden, 2008), and most critically, the ability to consider alternative possible actions ("opportunity to try otherwise"; e.g., Baumeister, 2008; Nahmias, Morris, Nadelhoffer, & Turner, 2005; Nichols, 2004; Sripada, 2016).

But they also capture something else, something not obvious in current psychological accounts of free will: her role as a member of a social group, and what her actions revealed about the capabilities, and by extension the possibilities of choice, for other women. But even though beliefs in free will are theorized to play a primary role in social behavior and participation in culture (e.g., Baumeister, 2008; Frith, 2013), they are often taken to be beliefs about the self and others as individuals, independent of group status or collective considerations.

But the social significance of her actions is not incidental to her retelling, nor is it absent from all folk-conceptions of freedom. Just a week before hearing this interview, I was sitting at a Passover Seder with family and friends, singing and telling stories about another social conception of will—freedom not inherently about the exercise of personal agency, but rather the freedom to set up a new social order, one with some sensible commandments but also many more arbitrary rules. After Exodus, the remaining books of the Old Testament are almost entirely devoted to detailing these rules, some of which we no longer follow (thankfully, we no longer sacrifice animals), and others which have become tradition (better hope you like eating dry crackers for seven days!).

It is tempting to ignore this latter example: that of a freedom *within*—or even *that creates*—the constraints of a social order. Perhaps it's just a case of the same word being used to refer to different things. Maybe the latter conception is ancient, no longer relevant, since while modern societies all contain some belief in free will as the freedom to intend and choose, they seldom equate freedom *qua* freedom with the governance of social groups. But then we have to consider the fact that, in our everyday descriptions of intentions and possible actions, we all, like Switzer, move fluidly between personal and social considerations, between our sense of limitless possibility, and our need for rules and constraints.

I will suggest here that our best way of understanding the folk psychology of free will is revealed by both stories. While our free will beliefs include the ability to construe our actions as choices, they also commonly include the ability to create constraints and to follow them. This applies to constraints created collectively for the purpose of regulating behavior of groups (our moral and societal norms), and individually for the purpose of regulating the self (for example, the habits and routines we use to manage health or increase productivity). Moreover, from the psychological perspective, constraints agreed upon by collective practice have something in common with constraints determined by our own personal preferences and goals.

The best evidence I can present for this view is the emergence of folk intuitions of free will in children, and in particular the development of culturally specific views of both personal and social possibilities for, and constraints on, actions. The emerging understandings of *wanting*, *intending*, and *choosing* play a central role in children's lives. The foundation of these understandings is culturally universal; infants not only act but also have beliefs about actions. These foundations are key to understanding how we as adults think about freedom and constraint, and so are developments in childhood that shape and transform beliefs to appropriate cultural emphasis. Across cultures, children learn about physical, biological, psychological, and social causes of action, and this knowledge in turn informs

their beliefs about possibilities for and constraints on free will. The ambiguity inherent in inferring motivations for action allows culture to play a significant role in shaping free will beliefs.

The paper is divided into five sections. The first brief section addresses the role of the experience of voluntary physical agency in our conception of free will and argues that it alone is not sufficient to explain why we have such a conception. The next three sections describe and provide developmental evidence for the social-cognitive basis of our free will beliefs. Section 2 centers on foundations in infancy; examples show how infants represent alternative possibilities for agents' behavior, as well as constraints (physical, epistemic, psychological, and social) on behavior. Section 3 connects conceptual development in early childhood—domain-specific causal theories about the world—to the developing understanding of free will. In this section, I argue that young children operate with a “causes are constraints” assumption on their capacity to imagine possible alternatives for action, and I review recent work showing how this assumption leads to some important developmental differences between younger and older children's free will beliefs. The fourth section describes how these beliefs change with development, and how culture plays a role in the change. I review empirical work documenting divergent views on free will in children growing up in Western and Eastern cultural contexts, and I speculate about some of the mechanisms of cultural learning that might give rise to these differences.

Though I won't be discussing debates over existence of free will (e.g., Mele, 2014; Pereboom, 2014), Section 5 raises a final important question: Given that we all (across cultures, and from early in development) have some version of a belief in free will, what purpose could these beliefs serve? To answer this question, I focus on the role of free will beliefs in self-regulation and self-control. Though there are still many open questions for future research, there is potential for developmental and cross-cultural data to provide insights into the nature of the relationship between what we believe and how we behave.

2 | WHY AGENTIC EXPERIENCE IS NOT SUFFICIENT FOR FORMING FREE WILL BELIEFS

Newborn infants are swaddled, changed, fed, passed around, and carried. Most of their movements are controlled by others, and thankfully so, for their survival depends on it. But during active waking and sleep, they are constantly moving, and classic studies show instrumental learning abilities from birth (DeCasper & Spence, 1986; Watson & Ramey, 1972). Rochat (2010, p. 326) writes: “The body is a primary object of perceptual exploration in infancy. As infants move and act, they perceive their own body moving and acting, hence detect its own organization, its physical characteristics, as well as its own vitality.” Rochat is not focused on will per se but argues that this ability to differentiate our own bodies from the world around us is sufficient as a basis for an emerging sense of self; infants move when and as often as they can to produce self-exploratory sensations, and eventually also intentional actions directed on objects (Needham, 2016). Similar patterns of exploratory behaviors have been observed in the way in which infants guide and control their visual attention as well (Kidd, Piantadosi, & Aslin, 2012).

The experience of physical agency, as differentiated from other types of experiences, might provide a unique basis for our belief in free will. Take, for instance, the claim that a belief in free will arises from the experience of choice-making. Holton (2009, p. x) uses this idea to explain what motivates adult intuitions about free will: “It is in making choices, and then sticking with the intentions that result, that we get an idea of ourselves as free agents.” In this one sentence, there are layers of psychological complexity. There is meaning (some implicit meaning of “choice”), metacognition (some ability to evaluate our mental states, namely intentions), and autobiographical content (some sense of self in time such that we experience sticking to plans). Each alone does not explain why the claim seems so reasonable. Put another way, our experience of this type of agency—and even less heavily deliberative and metacognitive versions of it—may be based in our physical experience but also goes beyond our physical experience.

At least in adults, our agentic experiences work in combination with beliefs of various sorts to produce feelings of will. Experimental results nicely illustrate the bi-directional nature of this relationship. When agentic experience is enhanced or disrupted, our beliefs about volition can be enhanced or disrupted accordingly (Blakemore & Frith, 2003; Haggard & Tsakiris, 2009). But also, directly manipulating beliefs in free will and autonomy alters our experience of agency (Aarts & Van den Bos, 2011; Pronin, Wegner, McCarthy, & Rodriguez, 2006). The most recent examples of the latter come from studies of self-control, acts of will that greatly benefit from even short-term changes in perspective (“construal level” shifts, e.g., Fujita & Carnevale, 2012).

Finally, our beliefs in choice, agency, and will don't always match reality. We sometimes feel we made a choice even when the evidence suggests that we didn't (Wegner, 2002). At other times, we feel as if we were led by circumstance to act in a particular way, even when those circumstances do not technically force our actions. Moreover, the very same acts may count as choices for one individual but not another (Paulhus & Carey, 2011) or by many individuals in one cultural group and not another (Kitayama, Snibbe, Markus, & Suzuki, 2004; Miller, Das, & Chakravarthy, 2011; Savani, Markus, Naidu, Kumar, & Berlia, 2010). As a final complication, our appraisals of the same behaviors sometimes vary depending on whether we are attributing responsibility to other individuals or to ourselves (Pronin & Kugler, 2010; Ross & Nisbett, 1991).

For a full developmental story, then, we have to consider ways in which cognitions critical to forming beliefs in free will arise from some other source and get applied to how we understand and interpret our agentic experiences.¹ The likely candidate is other, rather than the self: our emerging social cognition, arising from our interactions with and observations of other people, and our inferences about the goals, intentions, and mental states that give rise to their behavior.

3 | SOCIAL-COGNITIVE ORIGINS IN INFANCY: POSSIBILITY, EFFICIENCY, AND STATISTICAL LIKELIHOOD

Considering human actions in context unlocks their meaning. This is exactly what we do when we mentalize (or use our “theory of mind”) to make sense of the motivations, beliefs, or emotions of others. We may not always get the interpretation right, and certainly we are subject to biases that cloud our judgment about others and ourselves (see Epley, 2014), but how we arrive at our conclusions depends greatly on the actions we see, and context in which we see them. Just as we recognize objects in context, as figures against a ground, we interpret actions against a background of their possible or likely alternatives.

To explore the roots of our belief in free will, we look for evidence that infants also interpret actions in context. The empirical examples that follow show that they can and do. All of these studies were set up to show that infants infer others' goals and desires from observing their actions—that is, that infants have a capacity for mentalizing. But each of these studies also provides evidence that infants represent actions in a “can do otherwise” way and can use context to infer not only intentions but also alternative possibilities for, and constraints on, action. Just like adults.

Here is one classic example. Gergely, Bekkering, and Király (2002) allowed 14-month-old infants to observe an actor pressing a panel with her head to turn on a light. Either the actor was free to use her hands (they were placed on the table in front of her), or her hands were occupied (she used them to wrap herself in a blanket). After this demonstration, infants were given the panel themselves. In the “hands free” condition, infants pressed the panel with their heads, imitating the means as well as the goal of the action. Critically, however, in the “hands occupied” condition, infants imitated the action using the more efficient means—that is, they pressed the panel with their own free hands. Thus infants show, through their selective imitation, that they distinguish between the two contexts—those in which actions could have been performed otherwise and those in which actions were forced to be as they were due to a physical constraint.

This basic context-reading ability also governs infants' expectations about actions (i.e., their looking patterns). For example, after being habituated to an agent reaching over a barrier, 9-month-olds recognize that it will try more

efficient means of achieving an outcome if a barrier is removed (Csibra, Gergely, Bíró, Koós, & Brockbank, 1999). If an agent fails to achieve a goal due to a physical constraint such as a barrier, 10- to 12-month-old infants can infer (and thus expect) success later on when the barrier is absent (Brandone & Wellman, 2009). By 15 to 18 months, infants infer that physical barriers can block visual access (a physical constraint on a mental process), which can in turn determine subsequent actions (Buttelmann, Carpenter, & Tomasello, 2009; Onishi & Baillargeon, 2005; Southgate, Senju, & Csibra, 2007).

At least by the second year of life, infants' ability to take context into account is not limited to considering what happens when physical obstacles are removed. They are more likely to imitate actions that are linguistically marked as intentional ("there!") over those marked as accidental ("oops!"); e.g., Carpenter, Akhtar, & Tomasello, 1998). They also evaluate agents who "teasingly" show an unwillingness to share or help—that is, agents who could do otherwise, but choose *not* to—differently than agents who demonstrate good intentions, but genuine inability (Behne, Carpenter, Call, & Tomasello, 2005; Dunfield & Kuhlmeier, 2010; Hamlin, Wynn, & Bloom, 2008). Infants are, increasingly over the first 2 years, becoming attuned to choice-making in others, and this in turn informs social learning, social evaluation, and prosocial motivation.

From where do these amazing context-reading abilities originate? On one account, when observing human actions, infants innately assume efficient (in their terms "rational") goal attainment (Gergely & Csibra, 2003; Gergely & Jacob, 2012). By this account, efficiency is itself a constraint. This dichotomy—efficient vs. inefficient—may place hard limits on the set of alternatives infants consider.

But assumptions of efficiency alone do not explain the breadth of infants' context-reading abilities. Studies by Woodward and colleagues (Buresh & Woodward, 2007; Sommerville, Woodward, & Needham, 2005; Woodward, 1998) demonstrate that when two actions are equally efficient, thus equally rational in the above sense, infants at around the same age as those in the examples above can represent one possible course of action as an alternative to another. In these studies, infants are habituated to displays of an agent reaching towards one of two objects on a table. After habituation, object locations are switched and infants see the same agent reach for the same object in the new location (same goal, different percept) or the alternative object in the same location (new goal, same percept). Infants look longer at the location-consistent event, indicating that they expect the agent's reach to be consistent with the prior object choice.

Critically, this result relies on there being *two objects* to choose from. If one of the objects is blocked from the agent's (but not the infant participant's) view, infants form no expectations that the original action was goal-directed, as indicated by the fact that they look equally long at both text cases (Luo & Baillargeon, 2007). Thus it seems that infants need to see the second object as a potential alternative choice. Taking this one step further, it also suggests a limitation of infants' context-reading ability. Seemingly, infants don't consider *inaction* to be a viable alternative. This limitation becomes quite important later on as it takes years before children's free will beliefs begin to include the idea that actions can be inhibited (i.e., that one is free to exercise self-control).

The ability to observe equally efficient possible actions and interpret them as choices may arise from an assumption infants make about psychological agents: When acting in accord with their own intentions, goals, and desires, agents can (and consistently do) sample non-randomly from sets of possible actions. Studies by Xu and colleagues (Xu & Denison, 2009; Xu & Garcia, 2008) show that infants as young as 8 months expect randomly drawn samples to be representative of populations (for example, one red and four white balls if the box contains 20% red and 80% white balls). But what if the sample drawn was non-representative? Imagine a person intentionally taking several toys of one type (say, five rubber frogs) out of a toy box full of two types of toys (rubber frogs and rubber ducks) and playing happily with them. If most or all of the toys in the box are frogs, the statistical information is in keeping with random draws from the box. Thus, this situation would provide no evidence that the person *chose* frogs over ducks. If, however, the box is full of many ducks with very few frogs in it, then the sample of five frogs is not likely to have been drawn by chance. More likely, the person made a choice to take frogs and so is displaying a motivation, perhaps a preference, for frogs over ducks.

Kushnir, Xu, and Wellman (2010) showed random groups of 20-month-old infants this exact scenario. Infants saw a female experimenter select five toys of one type (e.g., frogs) out of a box containing a minority of that type (e.g., 18% frogs to 82% ducks) or a majority of that type (e.g., 82% frogs to 18% ducks). Social and affective cues signaling both intention and desire to play with the toys were constant and positive across conditions. Later on, a bowl of ducks and a bowl of frogs were placed in front of the child, and the experimenter held out her hand between them, asking for a toy. Infants were more likely to give her the frogs when they were in the minority of items in the box previously. When frogs were previously in the majority, the infants handed her both types of toys equally. Younger infants (10-month-olds) looking behavior show that their expectations about non-randomly sampled actions follow the same pattern (Wellman, Kushnir, Xu, & Brink, 2016). Across these experiments (also see Ma & Xu, 2011; Van de Vondervoort, Aknin, Kushnir, & Hamlin, 2018, for contextually varied replications), the box of toys served as a constraint on the possible samples that could emerge. The suggestion is that infants represent random samples as the (unintentional) alternative possibility and that violations of random sampling therefore signal that the person made a deliberate choice.

To summarize, the foundations of our free will beliefs lie in our ability to represent alternatives. As these examples make clear, infants' ability to infer the psychological motivations of others goes hand in hand with context reading. Infants can represent possible or likely alternatives and thus understand which actions are free to be otherwise and which are constrained by physical laws, epistemic access, or the availability of options in the surrounding environment. Moreover, to discover the exact motivations of an agent in any given situation seems to require this "can do otherwise" way of thinking. In this way, our nascent beliefs about free will are the drivers of mentalizing.

4 | DEVELOPING CONCEPTUAL KNOWLEDGE IN EARLY CHILDHOOD: "CAUSES ARE CONSTRAINTS"

When my daughter was almost 3 years old, she told her first joke at my expense. I was (as usual) late to something and wandering around the house looking everywhere for my keys. Though I said nothing about my predicament, she followed close behind me, chanting in her best pretend grown-up voice, "Where's my wallet? Where's my keys? Where's my cell phone? I can't find them!" She knew exactly what I was doing, and why I was doing it. She was teasing because she knew me. She could tell, and make light of, the reasons for my actions through her knowledge of my past behavior: habitual lateness and a tendency to forget where I had put things last. The joke revealed her understanding that there was no other way for the scene to unfold.

The past 30 years of research on children's developing conceptual knowledge sometimes reads like a science cookbook: start with innate, domain-specific precursors in infancy; add in experience—a mix of exploration, experimentation, testimonials from elders about the hidden causal forces at play—and presto!—causally coherent and separable intuitive "theories" of the physical, biological, psychological, and social world (Carey, 2009; Gelman, 2003; Gopnik & Meltzoff, 1997; Spelke & Kinzler, 2007; Wellman, 1990; Wellman & Gelman, 1992). This picture is the most useful way of understanding many aspects of conceptual development. It explains why, for example, different domain-specific theories develop along different time courses, why even foundational concepts (e.g., beliefs about nature or animal taxonomies, e.g., Bailenson, Shum, Atran, Medin, & Coley, 2002, Unsworth et al., 2012) are culturally dependent, and how it is that even young children appeal to causal principles that are not only unobserved but also unobservable.

On this picture, children's domain-specific knowledge allows them to provide the appropriate causal explanations depending on the phenomena under consideration: Physical events have physical causes, biological events have biological causes, and so on. Critically, though, putting this knowledge to use to explain human actions requires flexibility. Human actions are multidimensional events; they have physical, biological, psychological, *and* social causes. By at least age 4, children know this and readily make use of causal knowledge across domains to explain why people do what they do (for example, appropriately explaining behavior which is caused by a psychological state

“he wants to pour milk on his cereal,” a physical force “She is too heavy to float in the sky,” or a biological condition “Her hands were getting tired”; Schult & Wellman, 1997, pp. 297–298). Just as readily, at a young age, children consider all of these dimensions in an attempt to understand which actions are free, which are constrained, and what alternatives exist.

From the perspective of a young child, all potential causes of action can, if thought about in a certain way, act as potential constraints. My frantic search for keys has a characterological explanation, and, to the watchful child, character constrains possibility just as much as a physical obstacle or a blindfold. From our own research, we've found that the same children that say that you are free to choose to step off a stool or not to, or are free to draw any picture that you can see, also say that you cannot choose to simply float in the air rather than come down, and you cannot choose to copy a picture you can't see. And, as new causal knowledge is gained, there is the potential for considering more constraints. After learning that the flu makes you tired and weak, a 4-year-old knows that a child with the flu is not, in a sense, “free” to run and play with her friends. After acquiring an understanding of the epistemic precursors of fantasy play (Lillard, 1993), a 5-year-old knows that child who is “hopping up and down” but “has never seen a kangaroo before” cannot be pretending to be one (Chernyak, Kushnir, Sullivan, & Wang, 2013). Domain-specific causal knowledge guides preschoolers' direct judgments about what is possible or probable (Shtulman & Carey, 2007) and their beliefs about what can be done differently and thus what is or isn't a choice (Chernyak et al., 2013; Kushnir, Gopnik, Chernyak, Seiver, & Wellman, 2015; Sobel, 2004).

If we stop with these examples, children's intuitions don't seem that different from ours. But if we also consider the social and psychological causes of action, children at times look remarkably different. Two notable examples illustrate: First, 4-year-olds hold fast to the idea that “wanting” (especially really, really wanting) implies “choosing.” It is not until later that children understand that one can have conflicting desires (Atance & Meltzoff, 2006; Lagattuta, 2005; Lee & Atance, 2016) and not until age 6 that children endorse the freedom to inhibit strong desires (Kushnir et al., 2015). To justify that we “have to” choose what we want, 4-year-old children often appeal to the external properties of the desirable object (e.g., “the cookie is yummy”) and almost as often simply restate the desire itself (“because I want to”). This *action bias* presumably takes some experience to override; as discussed earlier, infants use observed actions and visible alternatives to infer goals, desires, and preferences. Inhibition of action, or *inaction*, is not easy to observe in others, not considered by infants to be a viable alternative, and thus may require some experience and self-reflection to fully understand.

Second, across multiple scenarios, using multiple methods of questioning, and in several cultures, we have consistently found that preschool-age children believe that one has to act in accordance with social and moral norms. It is not until roughly age 7 that children endorse the possibility of freely acting against norms, saying for example that someone had the freedom to break stated rules or conventions, to act unfairly, or to harm others, even if doing so would be wrong (Chernyak et al., 2013; Chernyak, Kang, & Kushnir, under revision; see also Kalish & Shiverick, 2004).

Children's direct judgments of possibility follow the same developmental pattern. Initially, young children have trouble imagining alternatives to improbable or immoral events and so tend to say that they are impossible (Lane, Ronfard, Francioli, & Harris, 2016). It is not until age 7 that they fully differentiate impossible events from unlikely or immoral ones (Shtulman & Carey, 2007; Shtulman & Phillips, 2017; see also Phillips & Cushman, 2017, for ways in which this reaction persists in adults under cognitive load). For young children, a rule of thumb seems to be that any credible cause, whether it be a statistical regularity, a mental state, or a moral rule, is also a credible constraint on possibility, and thus on freedom of choice.

I say “rule of thumb” because, consistently across studies, there are always exceptions. The rule and its exceptions are revealed most strikingly in children's explanations (Chernyak et al., under revision; Kushnir et al., 2015; Lane et al., 2016). First off, children's explanations when they *don't* endorse choice appeal to a range of domain-appropriate causes: physical (“It doesn't move”), epistemic (“I couldn't see it”), motivational (“She likes cookies”), prosocial (“it would hurt doggie's feelings”), or normative (“it's the rule”). Occasionally, however, even younger children do endorse choice, and in those cases, their explanations are more often than not imagined alternatives to the scenarios in the stories they were told. For example, in stories about inhibiting desires, many children changed

their interpretation of the story, making up alternate external conditions or internal motivations for the protagonist that might change the outcome. Some of these alternatives were very straightforward (“nothing that’s gonna jump out and scare her”) and others creative and even funny (“sometimes when you open the closet, something could fall on your head”; Kushnir et al., 2015). Critically, children’s explanations are appropriately constrained by physical, biological, and psychological causes—that is, children imagined real-world alternatives, not fantastical ones. As imaginative flexibility increases with additional knowledge and experience, it may contribute to age-related change in what children believe is possible to do and to choose to do (for a similar suggestion, see Lane et al., 2016).

The developmental changes outlined above follow a thread that begins in infancy. Free will beliefs involve considering both intentions and alternatives, and thus children’s beliefs about whether any given action is free or not free are tied not only to their social cognition but also to their causal knowledge about the world. Infants are limited by the causes they can tangibly see. As children gain more causal knowledge outside of immediate perceptual experience, they can imagine a wider range of constraints on alternatives and, therefore, reason about a wider range of limitations. But also, and increasingly so with age, children have a greater ability to imagine new alternatives and, therefore, reason about a wider range of possibilities for action and develop a broader conception of free will.

5 | CULTURAL DIFFERENCES: RESOLVING AMBIGUITIES BETWEEN PERSONAL AND SOCIAL MOTIVATIONS

Into these developments enters culture-specific causal knowledge, in particular culture-specific understandings of psychological and social causes of action. First, it should be clear from evidence of early emergence that some aspects of our free will beliefs are culturally universal. Indeed, a majority of adults across cultures are sensitive to the same contextual cues when judging whether human actions are or are not predetermined by physical laws (Sarkissian et al., 2010). There is also some cultural variation in the belief that moral responsibility is compatible with determinism (Hannikainen et al., under review; Nichols & Knobe, 2007). Moreover, the general idea of personal choice is understood and valued by both children and adults across cultures (e.g., Lagattuta, Nucci, & Bosacki, 2010; Miller et al., 2011; Savani et al., 2010). But we all, across cultures, also place high importance on moral and social norms, rules, and obligations towards others. In early childhood, explanations for human behavior appeal to social considerations, such as group membership (Chalik, Rivera, & Rhodes, 2014), social norms (Kalish & Shiverick, 2004), morals (Killen, Mulvey, Richardson, Jampol, & Woodward, 2011), and obligations (Wellman & Miller, 2008) as early and as often as explanations that appeal to mental states such as desires and beliefs (Wellman, 2014). Finally, our sense of agency and self, as it develops across cultures, includes personal and interpersonal dimensions, corresponding to basic human needs for both autonomy and relatedness.

Nevertheless, striking cultural differences exist. Moreover, they seem to emerge most often when personal considerations are in conflict with moral, social-normative, or interpersonal concerns (Miller & Bersoff, 1998; Miller, Goyal, & Wice, 2017). Considering the evidence available to children as they attempt to learn about personal and interpersonal causes of behavior, these beliefs are variable for good reason. Just observing statistical patterns of intentional actions, especially if sample sizes are small (just a few caregivers, siblings, etc.), leaves much causal ambiguity. If, to borrow an example from above, I reach for a sequence of ducks from a box of mostly frogs, my preference could be subjective (only mine), a preference or convention shared among members of my social group, or it could be due to the inherent value of the object itself (imagine if the box were full of precious stones, etc.). In fact, statistical evidence along just one more dimension, such as the number of social group members who also choose rubber ducks, resolves some of the ambiguity for preschool-age children (Diesendruck, Salzer, Kushnir, & Xu, 2015).

Cultural socialization practices, specifically the testimony of trusted adults, are probably the strongest influence towards resolving this causal ambiguity. Corresponding to well-studied cultural differences between Eastern and Western philosophies of mind, self, and action (Markus & Kitayama, 1991), Euro-American parents’ conversations with their children frequently reference thoughts and feelings in line with the cultural emphasis on autonomy and

individuality. This likely leads children to implicate psychological motivations, such as personal desires, as causes of action, and leads them to imagine possibilities that are consistent with personal goals. Conversely, East Asian parents' conversations with their children emphasize social interactions, consequences to others, group activities, and discipline, in line with the cultural emphasis on a sense of belonging and self-other relatedness (Mullen & Yi, 1995; Schröder et al., 2013; Wang, 2001; Wang & Fivush, 2005; Yau & Smetana, 2003). This likely leads to an emphasis on social causes such as norms and rules, and to imagining actions that align with social goals.

It takes time to accumulate all of this culturally specific knowledge, and accordingly cultural differences become more pronounced between early and middle childhood. As discussed above, preschool children tend to think that psychological states, social norms, and moral considerations all constrain choice. Thus, across cultures, preschool children look more similar to each other in their free will beliefs than do older children. For example, a cultural comparison between children in the United States and Nepal shows that, with age, children in the United States (in a mixed urban and rural region) increasingly say that one “can” and “will” act against social and moral norms if one wants to (Chernyak et al., 2013) while Nepali children (across both urban and rural regions) continue to view social and moral norms as constraints as they get older. Wentze et al. (2016) showed similar divergence between ages 4 and 6 in whether children in the United States (Berkeley, CA) and China (Beijing) believed one could “choose to” act against one's own desires.

A strong cultural emphasis on compliance with authority and rule-following might lead to even earlier cultural divergence. In two recent studies, we found that children in Singapore respond differently than do their US, Nepali, and Chinese counterparts even at age 4 and hold on to stronger beliefs about constraints on action as children in the United States begin to relax theirs (Chernyak et al., under revision; Zhao, Kang, Wentze, Gopnik, & Kushnir, under review). It isn't that children in Singapore do not ever endorse choice—they do—and when they do they explain with reference to alternative possibilities, just like children in the United States. But as their causal theories place greater emphasis on social rather than psychological causes of action, this both restricts and informs their beliefs about what is possible, especially regarding social and moral violations.

In sum, the emergence of cultural differences, and the specificity of these differences in cases of inherent causal ambiguity, also supports a more general point: Children's beliefs in free will are responsive to evidence from their social environments. They learn, from observed statistical regularities and from social input, what is possible, what is likely, and what alternatives exist.

6 | SELF-CONTROL

Willpower. The ability for cool, rational decisions to rule over impulsive ones. The formation of healthy habits. Giving up temporary pleasure now in order to act towards future goals. These are our current cultural obsessions. Perhaps it's no coincidence, then, that the picture of a preschool-age child staring wide-eyed at a single marshmallow and her subsequent inability to avoid the temptation has penetrated the popular discourse on everything child-related. Even first-year students in my introductory course who have never heard of Piaget know about Mischel's Marshmallow Task (e.g., Mischel, Shoda, & Rodriguez, 1989). We are all familiar with this story: Young children are impulsive and impatient and have little or no capacity for self-control. But those special few that, by luck or circumstance, happen to *wait an extra 15 minutes* for more marshmallows are the ones with the brilliant futures—high test scores, fewer health problems, more successful careers (Mischel et al., 2011). Recent interest in how self-discipline (measured as non-impulsivity, e.g., Duckworth & Seligman, 2005) is implicated in a host of positive outcomes echoes this trend. The secret to a happy life seems to be self-control.

So now we turn to our final question: If we see the origins of free will beliefs in early development, and if at least some of our beliefs about the will are culturally universal, then surely they have some adaptive function? Philosophers, social psychologists, and neuroscientists have speculated that our conscious experience of action, including the experience of free will, can influence social behavior, rational decision making, and, importantly, self-control. Is

there any evidence for this causal influence? If so, can we see this influence as free will beliefs emerge in childhood and across cultures?

At a minimum, it seems that free will beliefs and their variants (e.g., feelings of agency, perceptions of choice) are related to well-being, happiness, and intrinsic motivation (Crescioni, Baumeister, Ainsworth, Ent, & Lambert, 2016; Leotti, Iyengar, & Ochsner, 2010; Ryan & Deci, 2000), and recent evidence suggests that these associations are not specific to western cultural contexts (Li, Wang, Zhao, Kong, & Li, 2017). Moreover, correlations exist between free will beliefs and “success” measures that have been associated with self-discipline and self-control, such as better job performance (Stillman et al., 2010), and better academic performance (Feldman, Chandrashekar, & Wong, 2016).

A few studies have found that beliefs about choice and free will have concrete (and causal) effects on action in adults. Several studies have purported to show that inducing disbelief in free will can lead to immoral behavior in the short term (Vohs & Schooler, 2008²; Baumeister, Masicampo, & DeWall, 2009). Though the mechanism through which these manipulations operate remains unclear, similar inductions seem to cause passivity (Rigoni, Kühn, Sartori, & Brass, 2012) and to weaken response inhibition (Rigoni, Kühn, Gaudino, Sartori, & Brass, 2012). Thus both are likely candidates to at least partially explain the effect on moral behavior.

Choices that involve self-control benefit from psychological distance, a “view from above” on one’s own actions. In adults, indirect suggestions that encourage anticipating obstacles, affirming resolutions, and abstracting away from details help people resist current temptation in favor of later rewards (Fishbach & Hofmann, 2015; Fujita & Carnevale, 2012). Even children can benefit from psychological distance, for example, by imagining they are a favorite superhero (White et al., 2017). Free will beliefs could, perhaps, operate to increase psychological distance and thus help foster decisions that involve forgoing current gains for future ones.

One series of studies by Job and colleagues provide evidence for a causal link for one specific belief related to free will: namely the belief in the ego-depleting effects of exercising self-control (also known as beliefs in “willpower”). In a series of studies, they showed that manipulating willpower beliefs leads to increased stamina for difficult resource-intensive tasks (Job, Dweck, & Walton, 2010). More recent work shows that beliefs in ego-depletion seem to be culture-specific (Savani & Job, 2017): Whereas US adults typically view exercising self-control as depleting, most Indian adults hold an opposite view that the exercise of self-control is invigorating. Following from this, while US adults show depletion effects, Indian adults show the reverse pattern of increased stamina with increased difficulty.

Until recently, however, no studies have looked for evidence for links between more general free will beliefs and self-control abilities in children. Indirect evidence is encouraging that a link may exist. For example, the fact that children are influenced by social feedback and other contextual cues to wait for later rewards (Kidd, Palmeri, & Aslin, 2013) or persist on difficult tasks (Mueller & Dweck, 1998) suggests that self-control can be enhanced by intervening on children’s beliefs. Also suggestive is that children benefit from the perception of agency and choice in a range of tasks requiring self-regulation, including academic performance (Iyengar & Lepper, 1999), compliance with rules (Eisenberg, Cialdini, McCreath, & Shell, 1987), and unselfish sharing (Chernyak & Kushnir, 2013, 2017).

In recent work, we have begun to look for more direct evidence and have found that, where evidence exists, culture moderates the relationship. For example, Zhao, Kang, Wenthe, Gopnik, and Kushnir (2017), Zhao et al. (under review), and also Wenthe, Zhao, Gopnik, Kang, and Kushnir (in press) asked 4- to 8-year-old children across three cultures—United States, China, and Singapore—“free will” questions, taken from Kushnir et al. (2015: a series of vignettes which pose forms of the question “does she have to do what she wants or can she choose to do otherwise”). In addition, children completed a battery of inhibitory control tasks (including Stroop-like inhibition measures and marshmallow-like self-control measures). Age-related changes in both free will beliefs and inhibitory control behaviors were found universally in all three cultures. But, after controlling for age and culture effects, we found a culture-specific relationship between the beliefs and behaviors. In the US sample, beliefs about free will were positively correlated with inhibitory control. In Singapore and China, it was not. A replication in a sample of children in Lima, Peru, also found no correlation (Wenthe et al., in press).

This culturally moderated correlation leaves interesting open questions about the nature of the causal relationship between free will beliefs and self-control. One possibility, consistent with the cross-cultural research on adults, is that children's understanding of internal struggles of will both informs and is informed by their emerging cultural worldviews. US children are socialized to connect their emerging understanding of desires—how they operate, how they conflict, and how they can be overridden—with the struggles of the will. Thus, they interpret the experience of self-control as an internal struggle (and this could, over time, be reinforcing the link between desires and willpower). Children in Singapore, China, and Peru may instead interpret their struggle as externally driven by norms or expectations of others, or rather, as some theorists suggest (e.g., Lamm et al, 2017; Miller et al., 2011, 2017), through a model of self that aligns internal desires with external expectations.³

These results raise questions about the causal pathways through which cultural values, as they are transmitted by parents, interact with opportunities to practice self-control, and also with children's emerging ability to think for themselves about their own desires, accomplishments, and goals. To date, we have little evidence that directly manipulating children's beliefs in choice and free will can, in the short term, influence their behavior. One preliminary study with preschool children found that, as in adults, instructions that encourage beliefs in willpower as a malleable (limitless) rather than fixed (limited) resource lead to greater success in passing the Marshmallow Task (Haimovitz, Dweck, & Walton, 2015). Another (Wente, Kushnir, Segovia, Fernández Flecha, & Gopnik, 2017) found that experiencing failure at self-control tasks leads young children to be more pessimistic about their own free will. All of these results were only found with children in the United States. The extent to which these first-person experiences are viewed differently by children of different cultures is an open question.

7 | CONCLUDING REMARKS

I've argued here that free will beliefs are early-developing and culturally universal, and that the folk psychology of free will involves considering actions in the context of alternative possibilities and constraints on possibility. There are developmental differences in how children reason about the possibility of acting against desires, and there are both developmental and cultural differences in how children consider the social and moral limitations on possibility. Finally, there is new evidence emerging for developmentally early, culturally moderated links between free will beliefs and willpower, delay of gratification, and self-regulation.

It is my hope that the developmental story outlined here, which includes data from children growing up in diverse cultural contexts, resolves some outstanding issues arising out of studies of mostly western, mostly adult beliefs in free will: Do these beliefs arise from the experience of physical agency, or do they emerge from our theory of mind? Developmental data suggest that, though agency may be important, the origins of our free will beliefs are as much a product of our social cognition as our physical experience of agency. Do free will beliefs cause us to act in certain ways, or are they post-hoc explanations of actions that have already occurred? A developmental perspective—in which mechanisms of social and cultural learning *interact with* our imaginative capacity and with increasing abilities to make effective choices for ourselves—helps us understand why seemingly minor changes in context can have broad implications for the relation between free will beliefs and voluntary action.⁴

It is also my hope that this review invites more use of developmental and cross-cultural perspectives to tackle related questions at the intersection of psychology and philosophy: the nature of consciousness, the function of metacognitive and social-cognitive beliefs in the construction of self, and the moral and ethical treatment of others. There is no shortage of developmental data on these topics, but it has yet to be employed adequately, or frequently enough, in philosophical discussions of these issues.

Across ages and cultures, we are more alike than we are different. The hypotheses we entertain for causes of action emerge from a basic need to understand the social world, relate to it, and find our own place among those who matter to us. We need to first observe, and then—over time—begin to imagine possibilities *and* limitations on

actions, whether we believe they are internally or externally imposed. The development of free will beliefs depends on the balance of the two.

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ENDNOTES

- ¹ The contribution of early experiences of physical agency to the development of free will beliefs is an important open question. It could be the case that agentic experience must initially be interpreted through social-cognitive knowledge before we get the "sense" that our body movement is voluntary and could be otherwise (Chambon, Filevich, & Haggard, 2014). On the other hand, physical agency and social cognitive inference could be complementary sources of belief in free will. Neuroscientific approaches to development might reveal answers (thanks to an anonymous reviewer for raising the question).
- ² The magnitude and scope of these effects has been called into question by failed replication studies (e.g., Giner-Sorolla, Embley, & Johnson, 2017). Regardless of whether these particular short-term effects have any lasting consequences for behavior, links between free will beliefs and variants of these beliefs and behavior regulation are found in converging lines of work mentioned here.
- ³ It is notable that our studies measured inhibition with tasks that require compliance with rules (e.g., gift wrap, toy sort, and flanker), which might be importantly different from those that require waiting for future rewards (e.g., snack delay). Focusing on rule following could have allowed Chinese and Singaporean children to bypass considerations of internal states and simply focus on the rules, but the same may not be true for US children.
- ⁴ Another important related question is when in development we can first see signs of compatibilist (or other) intuitions about determinism and moral responsibility. Judgments of responsibility often depend on the context in which actions are presented rather than on beliefs about determinism per se (Monroe, Brady, & Malle, 2017; Nichols & Knobe, 2007), but also moral attitudes may motivate and shape different sorts of intuitions about determinism (Carey & Paulhus, 2013; Shariff et al., 2014). These results make sense in light of developmental evidence for the central role that social and psychological knowledge plays in the development of free will beliefs. Further developmental and cross-cultural data might provide a useful resolution to some of the contradictory findings in this literature (see Hannikainen et al., under review).

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