"It's Not Fair that James Gets All of Them":
A Cross-Cultural Comparison on the Development of
Third-Party Intervention

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Abstract

Human societies could not function without the existence of fairness norms. However, there will always be members of a society who behave selfishly and attempt to cheat, and there must therefore be additional societal norms of how fairness will be enforced. An effective way of enforcing fairness is by way of third-party intervention. Adults from many cultures in the world engage in third-party intervention, though some to a greater extent than others. This behavior emerges early in the U.S., with previous research showing that by the age of 6 children readily engage in third-party intervention (McAuliffe, Jordan, and Warneken, 2015). The development of this behavior in other cultures, however, is has not previously been researched. In the current study, I investigated third-party intervention behavior in children in Cambridge, Massachusetts, and in a series of small towns in the Kabarole District of western Uganda. I found that in the U.S., children ages 6-9 readily rejected unequal distributions of a valuable resource between two other players, though they were, to some extent, deterred by cost of intervention. In Uganda, children did not begin to systematically reject unequal distributions until ages 8-9, and in fact only behaved this way when intervention was costly. I conclude that these differences in third-party intervention behavior are not due to differences in equality norms or even endorsement of hypothetical intervention, but rather due to differences in norms of how much authority and decision-making power children are typically given in each society.

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Introduction

1. Introduction to Fairness Norms

"That's not *fair*!" is a declaration all too familiar to anyone who has witnessed first-graders attempting to share crayons, split a block of Play-Doh®, or distribute a handful of candy. And it's not just children who sound the alarm when they get short-shrifted. Throughout a person's life, her concern for getting her fair share does not diminish, and she even starts to care about fairness between other people. More likely than not, other people in this person's cultural and societal group share her concerns. In fact, every human society holds certain expectations for the behavior of its members, otherwise known as "societal norms" (Fehr & Fischbacher, 2004). These expectations and norms are crucial to the functioning of a society, both on a day-to-day basis and also on a larger structural and organizational scale. They serve to provide a (partial) solution to the "tragedy of the commons" (Hardin, 1968), which is a theory that says that there is an inherent tension between individual benefit and group benefit; while it is in each individual's best interest to be selfish, if everyone is selfish then the common resources disappear and each individual in the group suffers. This problem may be overcome, however, if members of society hold each other accountable to certain rules or expectations. One of the most central of these expectations is that people behave fairly when interacting with one another. Each society, however, may have its own idea about what such "fair" behavior looks like. How do these fairness norms differ between societal groups, and what are the developmental patterns of these norms in each group?

Here I will explore fairness norms and why they are important. I will then discuss more specifically how third parties intervene to enforce these norms and how this behavior varies between cultures. Finally, I will discuss what we can learn from studying children's development of norm enforcement behavior, especially cross-culturally. I will then introduce the current study, which fills a gap in the research by looking at how and when children in different cultures develop a tendency for third-party intervention.

Fairness Norms and the Threat of Cheaters

In discussing fairness norms, I will focus specifically on the implementation and enforcement of distributional fairness norms, which are those norms that govern how people should distribute resources. Distributional fairness norms in large part determine how we distribute – or how we think we should distribute – small resources on a personal level, and also large resources such as food, water, and money on a societal level.

Anyone who has experienced the thrill of life in a human society knows that the mere existence of norms of proper behavior does not ensure that everyone behaves fairly all the time. In fact people frequently break these norms. Those in a society who are selfish – that is, keep more for themselves than they should according to the fairness norms – are deemed "cheaters," and take advantage of a system in which most people cooperate. Cheaters could pose a serious threat to the functioning of society. If the cheaters consistently get more resources and have higher evolutionary fitness than the cooperators, more and more people may join the ranks of cheaters, and soon the cooperative system itself will be

undermined (Fehr & Fischbacher, 2004). If these cheaters are punished by the cooperators, however, the selfish individuals suffer a fitness cost, and cooperation remains the predominant phenotype (Fehr & Fischbacher, 2004). This idea was demonstrated in a public goods game conducted by Fehr and Gächter (2002) in Zurich, Switzerland. When it was possible for players to "cheat" by contributing less than the average to the public good, and they could get away with it, many players did just that. Contributions to the public good increased dramatically when players had the opportunity to punish defectors, thereby imposing a fitness cost on cheaters.

Enforcement of Fairness Norms

The tragedy of the commons (Hardin, 1968) occurs when selfishness is too prevalent in a social group, and so non-selfish individuals lose out on their fair share of resources. Thus, a logical strategy to maintain fairness is to prevent selfish behavior. In order to ensure that "cheaters" do not become too numerous, social groups need a way of enforcing fairness norms. Fairness norms help to keep a society running smoothly, but just as important is the enforcement of those norms in order to discourage cheating. In fact, the way in which these norms are enforced constitutes a norm of behavior in and of itself. Cooperative members of a society may use punishment as a way to incentivize cooperation and limit the number of occurrences of norm-violation. The importance of such punishment has been demonstrated by many behavioral and mathematical studies. In a six-player public goods game conducted in Zurich, Switzerland, defectors (those who did not contribute enough to the public good) were punished harshly by other players

(Fehr & Gächter, 2002). Punishment is important in all societies, but it is especially important in large societies, which have more complex structures and whose functioning relies less on kinship bonds (or even personal friendships) than do smaller societies. This was demonstrated by Henrich et al. (2010b), who conducted a cross-cultural third-party punishment game across 15 different societies, in which subjects were told that there were two other players in the game, and Player 1 got to divide up money between herself and Player 2. If the subject felt that Player 1 had not given enough money to Player 2, she then had the opportunity to pay a small cost so that Player 1 would lose a substantial part of her own allotment. The researchers found that subjects who lived in larger societies were more likely to punish than those in smaller societies. Boyd, Gintis, Bowles, and Richerson (2003) supported these field studies with mathematical modeling, showing that for cooperation to be sustained in large groups, defectors need to be punished, and in order for defectors to actually suffer an overall fitness cost, punishers need to be common enough so that it is more costly to cheat than to cooperate.

This model, in which cooperators pay a small cost in order to impose a larger cost on cheaters, is dependent on the maintenance of a critical mass of cooperators; if the number of cooperators dips below this critical mass, then each cooperator will have to pay a larger cost to punish a large amount of cheaters (Fehr & Gächter, 2002; Gurerk, Irlenbusch, & Rockenbach 2006). Paying such a large cost will become maladaptive for cooperators, and soon they will stop punishing, and may become cheaters themselves. Thus, there are actually two

types of cooperators – those who distribute resources equally and punish those who don't (both of which may be considered societal norms), and those who distribute resources equally but do not punish cheaters. The latter are, in a sense, free-riders, and rely on others to punish. In this paper, we are more interested in the first type of cooperator, who is often referred to as a "strong reciprocator" (Jensen, 2010; Marlowe et al., 2008).

Humans are the only species to consistently engage in third-party intervention (Jensen, 2010), though some forms of third-party intervention have been observed in non-human species. For example, male cleaner fish will aggress against females when they "cheat" by taking a portion of the valuable food and thereby cause the food to be removed (Raihani, Grutter, & Bshary, 2010), and in some circumstances chimpanzees will intervene in conflicts between other chimpanzees (de Waal and Luttrell, 1988). Third-party intervention when it comes to distribution of resources, however, seems to be a uniquely human behavior rather than an ancestral behavior, as chimpanzees, our closest relatives, do not engage in third-party intervention (Jensen, 2010; Riedl, Jensen, Call, & Tomasello, 2012).

Thus far, we have established that social groups have fairness norms that govern how individuals are expected to divide resources, and that punishing cheaters is important in order to maintain a critical level of cooperation. But where does this punishment tendency come from, and how does it develop during childhood? I will discuss these questions below, but before examining the

development of norm enforcement in children, we will first discuss what is already known about this behavior in adults.

2. Second-Party and Third-Party Enforcement of Fairness Norms in Adults

There are a number of ways to go about enforcing these norms and punishing cheaters, and, especially in the West, these methods have been well-studied in adult populations.

Second-Party Punishment

As discussed above, one of the most effective ways to enforce adherence to fairness norms is to punish those who break them—i.e., those who are selfish. Second-party punishment is one mechanism of punishing cheaters, although it does have limitations.

Second-party punishment is when person B punishes person A because person B directly suffered as a result of an action by person A. This may be thought of as "do-it-yourself" punishment (Jensen, 2010): if you ("the "second-party") are cheated, you may take it upon yourself to punish the cheater, thus employing second-party punishment.

It is has been found that adults across cultures readily engage in second-party punishment. A classic way of studying second-party punishment is the Ultimatum Game. In this game, the Actor is given a sum of money, and can decide how to divide it up between herself and the Recipient. The Recipient can then decide whether to accept this distribution so that both players get their respective allotment of money, or reject it so that neither gets any money. If the

Actor does not gives the Recipient what the Recipient deems an appropriate amount of money, and the Recipient rejects the offer, then the Recipient is engaging in costly second-party punishment (she suffers a cost in order that the actor will suffer an even larger cost). In a study of the Ultimatum Game conducted in 15 different cultures, rejection rates universally went down as the offers got closer to 50% (Henrich et al., 2006).

Second-party punishment is an effective way to punish cheaters and encourage adherence to fairness norms. However, there is a great deal of cheating that second-party punishment *cannot* regulate. For example, sometimes the victim is not present to witness the cheating. Sometimes the victim is not powerful enough to punish the cheater. Sometimes the victim is not even aware of the cheating. If not by second-party punishment alone, how does society keep this cheating in check? The answer may lie in third-party intervention.

Third-Party Intervention

Third-party intervention can be defined as a situation in which an actor punishes another individual, often in response to that individual acting selfishly and violating social or equality norms, even though the actor was unaffected by the selfish act.

Third-party intervention is a method of enforcing fairness norms, and it is an important branch of punishment because it can reinforce second-party punishment and can take place in situation where second-party punishment is inefficient, ineffective, or impossible. Existence of third-party intervention, in addition to second-party punishment, makes for a much more stable society, in

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which norms can be better enforced (Fehr & Fischbacher, 2004). Like second-party punishment, it has been widely studied in Western adult populations.

Third-party intervention is often studied by way of the classic Prisoners' Dilemma Game and Dictator Game. In the Prisoners' Dilemma Game, two players have an endowment of money and both have the option of either cooperating or defecting; if both cooperate they both get a high reward, if both defect they both get a small reward, and if one cooperates and one defects the defector gets a medium reward and the cooperator gets no reward. In the Dictator Game, the divider has an endowment of money and simply chooses how much to transfer to a Recipient. In Switzerland, these games were played in either a second-party punishment or a third-party intervention condition (Fehr & Fischbacher, 2004). In both conditions, one player could "punish" by giving away one of her own coins so that the other player would lose three coins (thus, punishment was costly for the punisher, but even more costly for the punished). In the Prisoners' Dilemma Game, the prisoners could punish each other in the second-party condition, and a third player could punish either of the two primary players in the third-party condition. In the Dictator Game, the Recipient could punish the Dictator in the second-party condition, and a third-party could punish the Dictator in the third-party condition. The researchers found that third parties did punish defectors and selfish dictators (though third-party intervention was not as prevalent as second-party punishment), even though the third-party members were not harmed by the other player and incurred a cost by punishing. Notably, the Recipients in the Dictator Game expected the third-party to punish more than

she actually did, which is an indication that third-party intervention is itself a norm; that is, a behavior that people are expected to engage in (Fehr & Fischbacher, 2004). Another study with similar methods was conducted in Australia, and replicated the Third Party Dictator Game results from Fehr and Fischbacher (2004) (Nikiforakis & Mitchel, 2014).

While these studies provide intriguing evidence for third-party intervention behavior, they are limited because all use subjects from Western populations (and many draw subjects specifically from Universities). Thus, the participants in the studies represent a very narrow demographic. Before drawing broad conclusions about human nature as it relates to third-party intervention, or any other behavior, studies must be conducted in many cultures across the globe, as it is possible (and often probable) that people from different cultures, when presented with a given situation, will respond differently, according to their own cultural norms.

This leads us to question how third-party intervention varies between cultures. To answer this question, we will first look at adult behavior, as it has been relatively well studied cross-culturally. We will then revisit the question of ontogeny, and examine studies exploring cross-cultural variation of development.

3. Cross-Cultural Studies of Third-Party Intervention in Adults

Introduction to Cross-Cultural Studies

There is an incredible amount of variation in human cultures – all over the world, people eat, sleep, and dress differently; people foster different types of

relationships, and raise their children according to different philosophies. In fact, almost all human behaviors vary from culture to culture (and often even from family to family). Therefore, in order to understand a human behavior such as norm enforcement, it is incredibly important to study the behavior in multiple cultures.

One prominent exploration of norm enforcement across cultures is an extensive analysis by Henrich, Heine, and Norenzayan (2010a). The authors describe the widespread imbalance in subject populations by explaining that most behavioral research is conducted with "WEIRD" populations – those that are Western, Educated, Industrialized, Rich, and Democratic. As one may imagine, people in this demographic often behave very differently than people living in other cultures. For example, WEIRD subjects who play the Dictator and Ultimatum Games typically offer between 40-50% of their initial endowment, and reject offers below 30%, whereas subjects in small-scale societies (including subsistence farmers and foragers) typically make lower offers and frequently do not reject any offers. In some cultures, there is even a tendency to engage punish those who are *too* cooperative. The ways in which WEIRD populations and other populations behave differently extend beyond these two basic games, and often apply not only to monetary distribution decisions, but also the way that people see the world around them. For example, adults in different cultures have different senses of how important it is to have personal choice in the workplace (Henrich et al., 2010a; Iyengar & DeVoe, 2003), and children from WEIRD populations reason about biological phenomena differently than do American Indian children

from rural Wisconsin (Henrich et al., 2010a; Ross, Medin, Coley, & Atran, 2003).

It is important to study variance in human behavior not only because it saves us

from making false generalizations about "all of humanity" from a small sample of

WEIRD subjects, but also because understanding human diversity (both in genes

and behavior) is incredibly important in forming hypotheses about human

evolution and gene-culture coevolution around the world (Henrich et al., 2010a).

Cross-Cultural Studies of Third-Party Intervention in Adults

Fortunately, third-party intervention has been relatively well-studied in

adult populations in non-Western cultures. Henrich et al. (2006) conducted the

Dictator Game and Third-Party Dictator Game in 15 different populations,

varying in geographic location, economy, and residence type. They found that in

all societies the likelihood of third-party punishment of the Dictator was

negatively correlated with the amount of the endowment the Dictator allotted to

the Recipient, but there were significant differences between the populations in

how harshly third-parties chose to punish for each distribution (for example, the

mean minimum acceptable offer that the Dictator could get away with and avoid

punishment was approximately 4% of the original endowment among the Hadza

of Tanzania, but approximately 26% among subjects from Accra City, Ghana).

Across these societies, Henrich et al. (2006) found that willingness to punish

small offers positively co-varied with altruistic behavior, as measured by high

offers in the Dictator Game. This suggests that costly punishment and a specific

type of altruism may have coevolved in some cultures. Henrich et al. (2010b)

conducted another cross-cultural study using a similar method, and found that

tendency to punish positively co-varies with community size. Results from Marlowe et al. (2008) support these findings; they conducted a third-party Dictator Game in 12 populations and found that the minimum acceptable offer was higher in larger societies. This is what we may expect, as enforcing cooperation becomes more difficult – but also more important – in larger societies, where there is more anonymity and cheating is harder to track. These conditions may lead a society to rely less on second-party punishment and more on harsh third-party intervention (Marlowe et al., 2008).

We must be cautious, however, when making such generalizations, even when we do examine results from many populations, as there are always some societies that do not fit the mold. For example, when people in the very small village of Wulukum, Papua New Guinea (population 350) played the Third Party Dictator Game, third parties frequently punished offers under 50%. Interestingly, however, the possibility of punishment in the Third Party Dictator Game did not make offers more generous than they were in the two-party Dictator and Ultimatum games (in fact, offers in the third-party intervention game were generally *less* generous than in the two-party games). (Tracer, Mueller, and Morse, 2004). The relatively high rate of third-party intervention in this very small society is likely due to some cultural phenomenon that is unique, or nearly unique, to this particular population, and is an example of why it is important to avoid over-generalization when it comes to drawing conclusions about human behavior.

Researchers have also conducted cross-cultural distribution norm enforcement studies using a public goods methodology. In this paradigm, participants each have the opportunity to contribute part of their own endowment of 20 tokens to the public good. The amount of tokens contributed to the communal pot is multiplied by 0.4 and redistributed evenly among the players. In addition, participants can pay one token to cause another player to lose three – thus constituting costly punishment (Herrmann, Thoni, and Gächter, 2008). This game provides a good illustration of the tragedy of the commons discussed above (Hardin, 1968). If there was no possibility of punishment, the best strategy for an individual player in this game would be to keep all her tokens, and invest none in the public pot. If every player used this strategy, however, everyone would come out even and no one would gain a profit; but if *all* the participants contributed *all* their tokens they would each gain a profit of 12, and wind up with 32 tokens at the end of the game. Although this public goods game was not strictly a third-party intervention study, because each player was an active participant in the distribution of the tokens (and in fact, each participant was both an Actor and a Recipient), it nonetheless provides a good example of an economic distribution and punishment study that found cross-cultural differences in behavior. Herrmann et al. (2008) conducted this study in 16 diverse societies, and found that in societies with strong civic cooperation norms, as measured by responses to select questions on the World Value Survey (such as acceptability of dodging public transport fares or tax evasion), people were more likely to punish other players who contributed less than they did.

As we have seen, sweeping conclusions drawn from research conducted only on WEIRD populations often do not apply to humanity as a whole. Many studies show that norm enforcement is a prime example of a behavior that varies between cultures. These studies are valuable in highlighting the importance of cross-cultural studies, but they have all been conducted on adult populations – therefore, we have yet to learn how and when these norms are acquired during childhood.

4. Cross-Cultural Studies of Development of Norm Enforcement

Development of Fairness Norms in Western Populations

By studying a behavior, specifically third-party intervention, in young children, we can get a sense of when this behavior emerges during childhood. By studying children across a range of ages and cultures, we can begin to understand whether third-party intervention is strongly influenced by social factors or whether it is an innate part of a child's behavior (McAuliffe, Jordan, and Warneken, 2015). If children of all ages and all cultures engage in third-party intervention equally, this would indicate that third-party intervention is a fundamental evolved behavior, and emerges as a part of a child's sense of fairness (McAuliffe et al. 2015). If, instead, children in different cultures have varying tendencies for third-party intervention, or if young children in all cultures demonstrated third-party intervention to a similar extent, but older children show more cross-cultural variation in their tendency to intervene and show behavior that is more aligned with adult behavior within their cultures, then this would

indicate that this behavior is determined by cultural influences rather than innate psychology, or perhaps that a certain tendency for third-party intervention is innate, and later in the childhood social and cultural factors take over.

In Western societies, research shows that an understanding of fairness norms and enforcement of these norms starts very early in life and continues to develop throughout childhood. A study conducted in Seattle, Washington by Schmidt and Sommerville (2011) used a Violation of Expectation paradigm to show that infants as young as 15 months expect a third party to distribute a resource equally between two other people. This equality norm continues throughout childhood. In another study, when an older child (6 to 8 years-old) in the U.S. was a third-party watching a distribution between two other players, she preferred a paper-doll distributor who divided resources equally over a paper-doll who divided resources unequally (Shaw, DeScioli, & Olson, 2012). Even when the child herself was one of the Recipients (and thus a second-party), this desire for equality did not disappear completely, even though her desire to adhere to the norm was battling with her desire for measurable personal gain; in this condition, the subject was approximately equally likely to prefer the doll that favored her in the distribution and the doll who divided resources equally (Shaw et al., 2012).

Further evidence for developing expectations of fairness and sharing over the course of childhood come from studies of children within a very wide age range. Smith, Blake, and Harris (2013) conducted a study in Cambridge in which they presented 3-8 year-olds with a collection of stickers, and asked the children a series of questions, among which were: how many they should share with another

participant, how many another participant should share with them, and how many they predicted another child had shared with them. Children were also asked to actually complete the task of sharing stickers with another participant. Smith et al. (2013) found that children of all ages asserted that they themselves should share equally, and that the other participant should as well. They also predicted that the other participant had in fact shared equally. Only the 7 and 8 year-olds, however, actually shared the stickers equally. This suggests that while even children as young as 3 have some sense of fairness norms, they don't begin to act on these norms until later in childhood, at least in this culture.

Cultural Shaping of Children's Behavior

Though these studies are valuable in shedding light on the development of fairness norms in some populations, we must be cautious not to make claims about universal child development after examining only WEIRD populations. In order to learn about the factors shaping the development of behaviors, it is critical to study the behaviors of children from a wide range of cultures. Humans, and especially human children, have evolved a remarkable ability to adapt our behaviors in cultural-specific ways (Henrich et al., 2010a). A child's development is shaped by a combination of biological evolution and cultural evolution (Henrich et al., 2010a). By studying children around the world, we may begin to understand how these two phenomena interact in ontogeny, and answer the question: how do social norms, which have so much cross-cultural variation among adult populations, shape the behavior of children? And at what age do children begin to conform to the social norms of their own culture?

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As one may expect, just as adults vary from population to population, cross-cultural studies often reveal distinct cultural differences in children as well, starting from a very young age. For example, Keller et al. (2004) conducted a study examining self-recognition in infants, and found the age at which infants developed self-recognition was correlated with parenting style (placed on a proximal-distal spectrum) which varied by culture.

Differences in development remain pronounced as children grow older. Rochat et al. (2009) conducted a study across seven different cultures in which children 3 and 5 years old shared resources between themselves and an adult or between two dolls. They found that children in all cultures tended to act at least somewhat selfishly when they themselves were a recipient, but were more likely to divide the resources equally if they were distributing between the two dolls. In addition, by age 5, children were more likely to share equally than they were at age 3, again demonstrating that this behavior develops during childhood. Most importantly, however, sharing behavior varied by culture. Specifically, children in cultures that are more heavily based on collectivist values (in other words, values that prioritize benefit to the community rather than the individual) shared the stickers more equally (though the researchers note that the development of this particular behavior may be linked not only to collectivist values, but also to family income, level of schooling, and degree of adult supervision).

A recent study investigated third-party sharing behavior in children in Uganda. In this game, children were told that two players came in the day before and did a good job of cleaning the room, and would therefore get stickers as

prizes. In the first scenario, the researcher had five stickers, and after giving two to each absent player, asked the child whether she should give the last sticker to Player 1, or whether she should throw it away. In the second scenario, the researcher instead had four stickers, and after giving one to each absent player, asked the child whether she should give one more to each player, or throw them both away (Paulus, 2015) These results were compared with those of a similar study conducted in the U.S. by Shaw and Olson (2012). In the first scenario, children in Uganda were more likely to say that the sticker should go to Player 1, while children in the U.S. were more likely to say that the sticker should be thrown away. When it came to the second scenario, in both countries, children were highly likely to distribute the resources equally rather than throw them away. This study is especially relevant to the current study because it examines cross-cultural differences in equality norms between children in the U.S. and Uganda, and suggests that children in both countries value equality of distribution, but U.S. children prioritize equality while Ugandan children prioritize not being wasteful, perhaps.

One may reasonably hypothesize that just as children's self-recognition, sharing behavior, and distribution norms vary between cultures, enforcement of fairness norms varies as well. To investigate this hypothesis, we will begin by examining what is already known about third-party intervention in a few cultures.

Third-Party Intervention in Children in Western Populations

In order for third-party intervention to emerge, children need a willingness to punish those who break the "rules." Shultz, Wright, and Schleifer (1986)

conducted a study examining how children 5 to 11 years-old (Canadian middle-class subjects) assigned moral responsibility and punished those who did not behave according to what the child deemed appropriate. When a child was asked to imagine a scenario in which another child performed a transgression against her (for example, damaged her paper airplane), even the youngest subjects stated a desire to punish the transgressor. This study only examined second-party punishment, not third-party intervention, but it is nevertheless important to note that young children (in this particular culture) show a willingness to punish other children who have done some misdeed.

When it comes to true third-party intervention, studies have shown that in the West, children develop a tendency to right a wrong by intervening as a third-party by early- to middle- childhood. For example, 4-year-olds in Uppsala, Sweden, showed a tendency to retell a story with the transgressor getting punished, even when the original story (narrated by an adult) had the victim getting punished (Kenward & Osth, 2012). Three-year-olds in Germany demonstrated a different sort of third-party intervention. When they observed one puppet behaving rudely toward another (tearing up her painting, for example), the child often intervened by tattling and subsequently behaved especially nicely toward the victim (Vaish, Missana, & Tomasello, 2011).

In the Vaish et al. (2011) study, children had to pay a small effort cost in order to intervene. In real-life situations, however, the cost (in time, effort, risk, or valuable resource) is often higher, and may be a significant factor in an individual's decisions to intervene or not. The effect of cost can be measured in

the lab by requiring children to give up a valuable, physical resource in order to intervene. We thus call such intervention "costly third-party intervention." In WEIRD populations, costly third-party intervention seems to develop sometime in mid-childhood. Jordan, McAuliffe, and Warneken (2014) conducted a study examining third-party intervention in children in Cambridge, Massachusetts. In this game, children 5 and 6 years-old were given an endowment of candies to use to make decisions. They were told that an Actor (the "Decider") and a Recipient had come in the day before and the Actor had decided on a series of distributions of candies between herself and the Recipient. As the child was presented with the distributions, she either accepted or rejected each one. She was told that if she accepted, the Actor and Recipient would receive their respective number of candies to take home, and if she rejected (constituting punishment), neither the Actor nor the Recipient would get to take home the candy. In one condition, the child could freely reject the offers, while in the other condition, she had to pay up one of her own candies in order to reject the offers (in both conditions, accepting the offers was free). Jordan et al. (2014) found that both 5 year-olds and 6 year-olds were more willing to intervene when they could do so freely. Six year-olds, though not 5 year-olds, were willing to pay a cost to reject unequal (selfish) offers, and thus engage in costly third-party intervention.

This pattern of behavior is true of children is Cambridge, but is it true in other cultures as well? Or is there cross-cultural variation in the development of costly and free third-party intervention behavior?

5. Current Work: Cross-Cultural Study of Third-Party Intervention in Children

There is one previous study that attempts to examine third-party punishment in a cross-cultural context, but the design of this study does not allow for discrimination between second- and third-party punishments. In this game, stingy and generous puppets shared tokens between themselves and a child, and at the end of the game the child could sacrifice one of her own tokens in order to make one of the puppets lose five tokens. The researchers found that 5 year-olds in the U.S. punished the stingy puppet more often than the generous puppet, while 5 year-olds in Samoa were equally as likely to punish either puppet (Robbins & Rochat, 2011). However, because the subject was a Recipient in the initial sharing game, she was not a third-party, and thus could not engage in true third-party intervention.

Until now, there has been no cross-cultural study directly examining third-party intervention in children. I aimed to fill this gap in the research by conducting a third-party intervention study with children from both the area surrounding Fort Portal in western Uganda and Cambridge, Massachusetts. In contrast to the Robbins and Rochat (2011) study discussed above, subjects in our study observed a distribution of candy between two other players, and made decisions using their own endowment of candy which they received from the experimenter at the beginning of the game. In this set up, the child was truly a third party, who was neither helped nor harmed by either of the other players. I used a methodology very similar to Jordan et al.'s (2014), with the only

significant change being the design of the apparatus. I also conducted a follow-up study to better understand whether children respond differently when asked about hypothetical third-party intervention than when asked to actually engage in third-party intervention themselves.

Studying children in Cambridge, MA and in the area surrounding Fort Portal, Uganda, made for an ideal cultural comparison, as members of these respective cultures have very different lifestyles and life experiences. I will not go into detail about the lifestyle of people in Cambridge, MA, as this is a thoroughly studied population, but I will briefly attempt to describe life in Fort Portal. Uganda has experienced economic growth in recent years, but is still considered under under-industrialized (Salassie, 2008). Agriculture is the most common means of subsistence, and many parents earn money by picking tea leaves (Zarin Machanda, personal communication). Large families often share small homes, and instead of separate bedrooms all family members often sleep on roll-out mats in one room. Most children have very few possessions of their own, but create make-shift toys out of grocery bags and banana fiber. Children come to school by walking or riding bicycles along dirt roads, and neither homes nor schools have electricity. Children generally do not bring their own supplies to school, but rather classrooms share a very limited number of paper, pencils, erasers, etc. (Zarin Machanda, personal communication, as well as personal observation.)

In the current study, I hypothesize that children in both cultures will demonstrate equality fairness norms by showing more willingness to reject unequal than equal distributions. However, based on the results of Paulus (2015),

I hypothesize that children in Uganda will be overall less likely to reject distributions than children in the U.S. Specifically, I think that Ugandan children may reject equal distributions at similar rates as U.S. children (as this may not be a demonstration of third-party intervention but rather a mark of the children exploring their options in the game), but will be less likely than U.S. children to reject unequal distributions. As children in Uganda are not generally given much authority or decision-making power, I reason that they will be less inclined to engage in third-part intervention.

However, to the extent that Ugandan children do intervene, I predict that they will be less sensitive to cost than U.S. children will be – that is, I think that U.S. children will be more deterred by cost than Ugandan children will be; though children in Uganda don't have as much access to food as children in the U.S., I predict that the collectivist nature of Ugandan society will have a greater impact on this decision making than the scarcity of food.

I also predict that there will be a trend in both cultures of younger children behaving more selfishly than older children – that is, younger children will be more deterred by cost than older children, following the results of Jordan et al. (2014) (young children in Uganda may also be more deterred by cost than older children because they have not yet internalized the collectivist values of the society).

I hypothesize that the vast majority of children will demonstrate recognition of a distributional equality norm and a norm of third-party intervention, and that children's answers to the hypothetical questions will show

less variation between cultures than their actual behavior (as the cultural norms that dictate how a person *actually* behaves may be more nuanced than those that dictate how a person *should* behave), but that responses to these hypothetical scenarios, especially in younger children, will not necessarily be mirrored by their actual behavior (following Smith et al., 2013).

Overall, I hypothesize that actual third-party intervention behavior will vary between these two populations, even though they may similarly endorse hypothetical distributional equality and third-party intervention.

Studying children in different cultures around the world can provide an important insight to the development, universality, and evolutionary significance of a set of behaviors. The enforcement of fairness norms in the form of third-party intervention has been well-studied in adults in many cultures, and has been studied in children in Western cultures. But a crucial piece of the puzzle is missing – a study of third-party intervention in children in non-Western cultures. The current study begins to fill that gap.

Methods

1. Participants

Uganda participants

92 children were recruited from four primary schools in the Kabarole District of western Uganda. I tested 49 girls and 38 boys, divided into three age groups of 6-7-year-olds (N=29), 8-9-year-olds (N=37), and 10-11-year-olds (N=21). 5 additional subjects were excluded due to experimenter error (3), because the subject had the same name as one of the absent players in the game (1), or because the subject could not have Skittles, which were used as the resource in the game (1). Basic demographic information is valuable in all behavioral studies, and is especially relevant in a cross-cultural comparison. All participants lived in the villages surrounding their respective schools. In this area, generally the mothers have some primary school (the equivalent of eight grade) but no secondary school (the equivalent of high school), and are often illiterate. Fathers are more likely to have completed primary and possibly secondary school, but many have not.

The experimenters first met with the headmasters of each of these schools to explain the research project, the consenting process, and what the students would be asked to do in the study. I asked the headmasters to select students at random to invite to participate in the study, balanced across ages and genders. The headmasters sent letters home with the selected students, inviting the parents to come to an informational meeting at the school. At the informational meeting for parents, the primary experimenter explained the purpose of the study and what the

children would do during the experiment. At the meeting, parents who wanted

their children to participate signed form which asked for permission for their child

to participate, permission to videotape their child, permission to give their child

Skittles (which parents were allowed to sample), as well as how many adults and

children live in their household, and which town they are from. Parents who were

illiterate gave verbal consent, and the primary experimenter assisted them in

filling out the consent form.

The invitation to the informational meeting, the explanation at the

meeting, and the consent form were all in Rutooro, the local language. All

experimental sessions were also conducted in Rutooro.

Children were tested in unoccupied libraries or classrooms at their

respective schools. One child participated in each test session. She sat across from

the primary experimenter, who explained the rules of the game and conducted the

experiment.

The primary experimenter was a local adult female University student,

fluent in the local language and culture. The secondary experimenter sat on the

side of the testing rooms and worked the video camera and live-coded children's

decisions throughout the game.

United States participants

59 children were recruited from a child database, and lived in the Greater

Cambridge area. I tested 24 girls and 35 boys, divided into two age groups of 6-7-

year-olds (N=33) and 8-9-year-olds (N=26). 8 additional subjects were excluded

from both experiments because the subject could not have Skittles or did not like

Skittles (4) or because the subject failed to follow instructions (4). 1 subject who was included in Task 1 did not participate in Task 2 because of an interrupt by the fire alarm. Most parents (N=55) chose to fill out a demographic form, which indicated that 82% of children were white or a mix of white and Native Hawaiian/Pacific Islander. Regarding the education level of parents, 90% of children had at least one parent who had achieved a college diploma or higher level of education (and for 75% of children, this was true of both parents).

The experimenter explained the purpose of the study and what the children would do during the study individually to parents who wanted their children to participate. Parents then signed a consent form, which gave permission for their child to participate and receive Skittles. (The recruitment database had information about the number of adults and children living in the household and where the family was from, so it was not necessary to ask for this information on the United States consent forms). All parent explanations and experimental sessions were conducted in English.

Children were tested in a laboratory in Cambridge, Massachusetts. As in Uganda, one child participated in each test session. The children sat across from the experimenter, who explained the rules of the game and conducted the experiment.

The experimenter was a local adult female University student, fluent in the local language and culture. There was no secondary experimenter in the United States sessions.

2. Design

Task 1 was a Third Party Intervention game designed to measure children's willingness to intervene as a third party when an Actor distributes a resource unfairly, and to measure whether this willingness decreases when the children have to pay a price in order to intervene.

In this game, children made decisions about distributions of candy between two other absent children, who allegedly played the game the previous day. We used Skittles as the candy because Skittles are popular in the U.S.,, and a previous study found that children in this area of Uganda considered Skittles a high value resource after sampling them (Bowie, 2013). Subjects were told that yesterday, one of the players (the Actor) got to distribute Skittles between herself and the other player (the Recipient), and today, the subject would get to decide how many Skittles each player got to take home. For each distribution, the subject could either accept the distribution, in which case both players got to take home their allotted candy, or reject the distribution, in which case neither player got to take home the candy. Thus, rejection of a distribution constituted third party intervention.

Each subject was shown 12 different Skittle distributions, half of which were equal (3 for the Actor and 3 for the Recipient) and half of which were unequal (6 for the Actor and 0 for the Recipient). Subjects received an endowment of 25 Skittles at the beginning of the game to use to make decisions. In the "free" condition, subjects could accept or reject each distribution freely, and take home all 25 Skittles at the end of the game. In the "costly" condition,

children could accept distributions freely, but had to give up one of their own Skittles to reject distributions. Thus, intervention was costly, as it depleted the number of Skittles the subject got to take home.

Task 2 was a hypothetical scenario question-answer game, designed to measure how children think about hypothetical rights and wrongs, and whether or not other children should hypothetically engage in third-party intervention. Children were shown four scenarios illustrated with cut-out, laminated figures. The two "equality" scenarios asked subjects about how a resource should be divided between two children, and the two "intervention" scenarios asked subjects whether, after witnessing a misdeed, a child who intervened or a child who simply stood by did the right thing.

3. Task 1: Third Party Intervention Game

Apparatus

Free condition: a half green, half red box sat in the middle of the table (the box was a cardboard tissue box covered in duct tape). In the top of the box was a big middle hole, and a small hole on each side. There was also a trapdoor on the bottom to make for easy removal of the 25 Skittles that were deposited in it in the beginning of the game. From the child's perspective, the green side was always on the left and the red side was always on the right. To "accept" a distribution, the subject took a Skittle from the big middle hole and put it through the small green hole. To "reject" a distribution, the subject took a Skittle from the big hole and

put it through the small red hole. See Figure 1 for an illustration of the free condition.
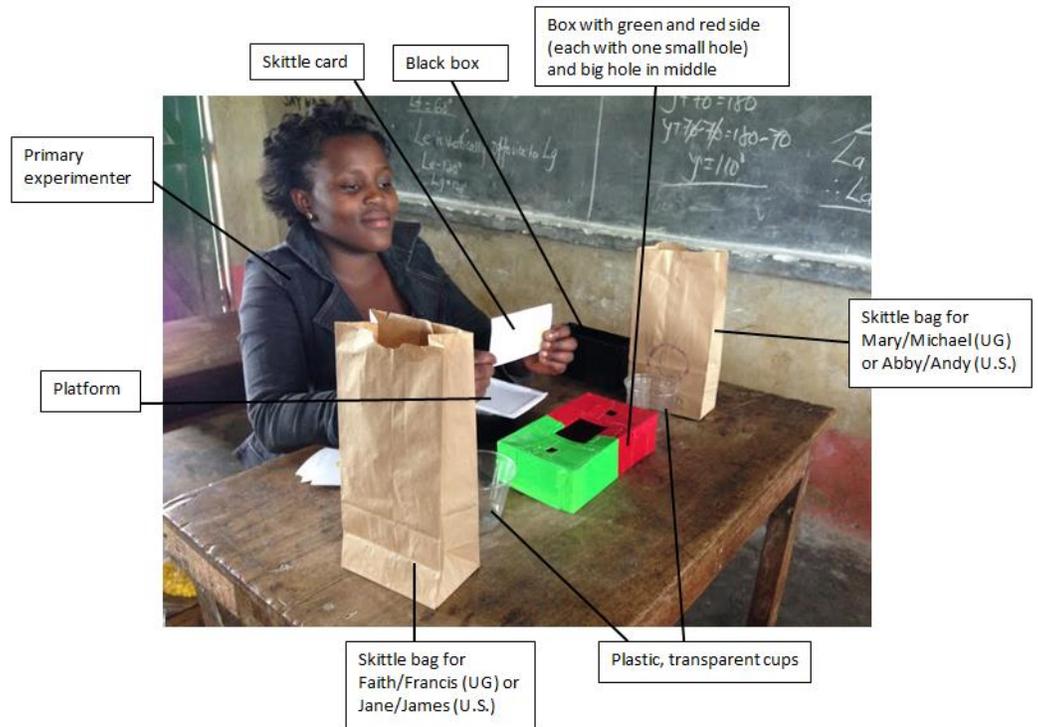
Figure 1. Primary experimenter with free condition apparatus (in Uganda)

Costly condition: two boxes sat in the middle of the table, one green and one red, each approximately half the size of the large box used in the free condition (each smaller box was a cardboard tea box covered in duct tape). The top of the green box had one big hole and one small hole, and the top of the red box had just one small hole. The red box had a small trapdoor on the bottom to make for easy removal of Skittles. From the child's perspective, the green box was always on the left and the red box was always on the right. The green box was positioned so that the big hole was close to the red box (thus, as in the free condition, the big hole was in between the green and red small holes). 25 Skittles were deposited into the green box in the beginning of the game. To "accept" a

distribution, the subject took a Skittle from the big green hole and put it through the small green hole (back into the green box). To "reject" a distribution, the subject took a Skittle from the big green hole and put it through the small red hole (into the red box). See Figure 2 for an illustration of the costly condition.
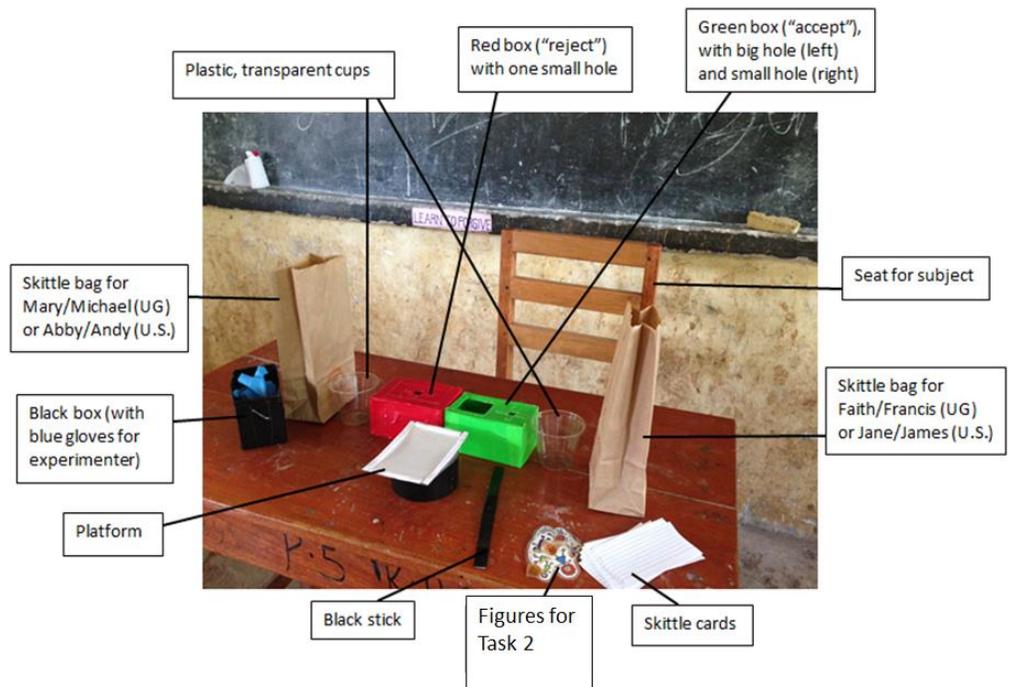
Figure 2. Costly condition apparatus (in Uganda)

Both conditions: On either side of the box(es) was a paper bag that belonged to each of the fake players who played the game the day before, to take their Skittles home in. See Appendix A, Photograph 1 and 2 for pictures of the fake players' bags. Each paper Skittle bag had a drawing of a face on it, and was labeled with the fake players' name. In Uganda, female subjects were told that the other players were named Faith and Mary, and Male subjects were told that the other players were named Francis and Michael. In the U.S., female subjects were told that the other players were named Jane and Abby, and male subjects were

told that the other players were named James and Andy. If subject had one of these names, an alternate name was used for the player.

From the child's perspective, Faith/Francis' bag or Jane/James' bag was always on the left, and Mary/Michael's bag or Abby/Andy's bag was always on the right. There was a third paper bag on the table that belonged to the subject (not pictured in Figure 1), and at the beginning of the session the experimenter gave the subject a crayon and asked the subject to draw her/his own picture and name on the bag.

In between the box(es) and each Skittle bag was a plastic, transparent cup. Each cup corresponded to the Skittle bag that it was next to, and was used to visualize how the Actor wanted to divide the Skittles between herself and the other player, before the child accepted or rejected the distribution. Once the child made her/his decision, the experimenter either dumped the cups into the respective Skittle bags (if the subject "accepted") or into a black box so no one could take them home (if the subject "rejected"). The black box was close to the experimenter's left hand, and was open at the top.

Directly in front of the experimenter was a small platform consisting of a quarter sheet of laminated paper (with ridges on the edges made of rolled up strips of paper) resting on top of a black roll of duct tape. The experimenter used this platform to lay out six Skittles at the beginning of each trial. Next to this platform was a flat black stick long enough to cover both small holes in both conditions. (The stick was a thin piece of cardboard covered in black duct tape. See Figure 2.) The experimenter used this stick to cover the holes during the beginning of each

trial, and removed it during each trial to indicate that the subject could make her/his decision.

For each trial, the experimenter presented the subject with an index card illustrating how the Actor from the day before wanted to distribute the Skittles between herself and the other player. Each card had a shaded half and a plain half. The experimenter told the subject that yesterday, the decider drew circles on the shaded half to represent the Skittles the Actor wanted to keep for herself, and drew circles on the plain half to represent the Skittles the Actor wanted to give to the other player. See Figure 3 for an illustration of the Skittle cards.
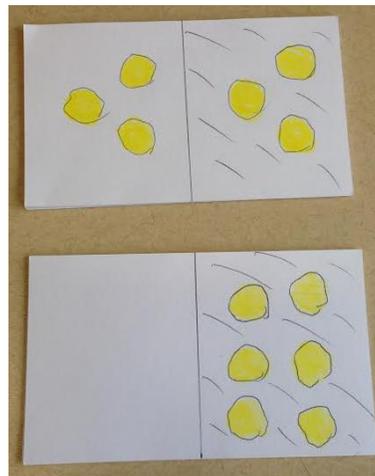
Figure 1. Skittle cards. Top: Equal trial; Actor wants to keep three Skittles for herself (right, shaded side) and give three Skittles to the other player (left, plain side). Bottom: Unequal trial; Actor wants to keep six Skittles for herself (right, shaded side) and give zero Skittles to the other player (left, plain side).

Each subject was given a choice between two colors of Skittles, and whichever color she picked was used throughout the rest of the game. The Skittles that the experimenter used for each trial were kept in plastic sandwich bags. For sanitary purposes, the experimenter wore latex-free plastic gloves during Task 1 (not pictured in Figure 1).

Procedure

Introduction to game

The experimenter gave the subject a Skittle to eat in order to familiarize
the subject with the resource used in the game, and asked the subject whether she
liked the Skittle in order to determine whether it could be considered a valuable
resource The subject then chose between two different colors of Skittles, and the
color she selected was used throughout the rest of the game.

The experimenter explained that this is a three-person game, and the
subject's job is to make all the decisions using the box(es) in the middle of the
table.

Introduction to other players

The experimenter explained that yesterday two kids came in to play the
game. The subject was told that the players from yesterday were her/his same age,
and really liked Skittles. The experimenter said that the players drew pictures of
themselves on their respective paper Skittle bags for the Skittles that they will
take home when they come in later, and showed the subject the paper Skittle bags
with the drawings of the kids' faces and names.

The experimenter told the subject that the other two players played part of
the game yesterday, and today the subject would play the other part. The child
was then instructed to decorate her/his own Skittle bag for the Skittles that she
would take home. The experimenter provided a crayon for this purpose.

After the child drew her own face on the Skittle bag, the experimenter
explained that yesterday one of the players was the divider, and got to decide how

to divide the Skittles between herself and the other player. The identity of the divider was counterbalanced.

Explanation of red/green consequences for the other players and practice trials

The experimenter told the subject that she had the important job of deciding how many Skittles the other players got to take home. There were then two practice trials.

"Just for practice," the experimenter put down six Skittles on the platform, in a row perpendicular to the box(es). The experimenter said "let's pretend that [the Actor] decided to do *this*" and took three of the Skittles in each hand and dropped them into the plastic cups next to the Skittle bags, so that each cup held three Skittles.

Practice Trial #1: The experimenter pointed to the green hole and explained that if the subject dropped a Skittle into the green hole, the Skittles in the cups would go into the respective Skittle bags for the other players to take home. The experimenter handed the subject a Skittle and asked her to demonstrate how to make the Skittles go into the bags. If the subject correctly dropped a Skittle through the green hole, the experimenter dumped each cup into its respective bag. The child thus "accepted" the distribution.

Practice Trial #2: The experimenter put six more Skittles on the platform and repeated the process with the red hole, but explained that if the subject dropped a Skittle into the red the Skittles in the cups would be put into the black box, and no one would get to take them home at the end of the game. If the subject correctly dropped the provided Skittle through the red hole, the

experimenter dumped the Skittles in both cups into the black box. The child thus intervened and "rejected" the distribution.

If the child did not drop the Skittle through the correct hole in either practice trial (usually either by putting the Skittle into the wrong box, or into one of the plastic cups, or through the big hole instead of one of the small holes, or occasionally by giving in to temptation and eating the Skittle), the experimenter immediately repeated the instructions for that practice trial and gave the subject another Skittle to practice with.

Sometimes Practice Trial #1 was green and #2 was red, and sometimes vice versa, according to green/red counterbalancing.

Skittle card intro

The experimenter told the child that yesterday, the Actor drew "Skittle cards" to illustrate how she wanted to divide the Skittles. The experimenter showed the subject the first Skittle card, and explained that the Skittles that the Actor wanted to keep for herself are drawn on the shaded side of the card, and the Skittles that the Actor wanted to give to the Recipient are drawn on the plain side of the card (see Figure 3). The experimenter pointed to each side of the card as she referenced it, and held the card so that the shaded side was oriented toward the Actor's bag and the plain side was oriented toward the Recipient's bag.

After explaining the shaded and plain side, the experimenter explicitly stated how many Skittles the Actor wanted to keep for herself and how many she wanted to give to the Recipient for that card. The experimenter then presented a

second Skittle card and again explicitly stated how many Skittles were to be kept and given away.

Each Skittle card either had an equal distribution (with three Skittles drawn on each side), or an unequal distribution (with six Skittles on the shaded [Actor's] side and zero on the plain [Recipient's] side). One of the demonstration cards was equal and the other was unequal, with order of presentation was determined by counterbalancing.

Explanation of red/green consequences, both for subject and for other players

Next, the experimenter poured 25 pre-counted Skittles into the big hole (the big hole in the middle of the box in the Free condition, and the big hole in the green box in the Costly condition,) and told the subject that those were her Skittles to use in the game. The experimenter explained that to make a decision, the subject first had to take a Skittle out of the big hole, and then drop it into either the green or red hole, and reiterated the results of each of these decisions (keeping the order of green/red explanation consistent with the green/red counterbalancing).

The experimenter then explained what happened to the Skittles in the boxes at the end of the game. In both conditions, at the end of the game the Skittles in the black box were "put away" and no one got to take them home. In the free condition, at the end of the game all the Skittles in the green/red box went into the subject's bag for her to take home. In the costly condition, at the end of the game all the Skittles in the green box went into the subject's bag for her to take home, and all the Skittles in the red box were put into the black box and no

one got to take them home. Thus, in the costly condition only, the subject had to give up one of her/his own Skittles in order to intervene.

Finally, the experimenter put the black stick on top of the box(es) and told the subject that she had to wait until the stick is moved before making a decision.

Pre-test comprehension check

Before the game began, the experimenter asked the subject several questions to ensure that she understood the premise and rules of the game. The questions were as follows:

1. "What do you do if you want the Skittles to go into the bags?"

2. "What do you do if you want the Skittles to go into the black box?"

  The order of #1 and #2 was counterbalanced in line with the green/red counterbalancing.

3. "When they played the game yesterday, did the other players take home any Skittles?"

4. "Who gets the Skittles in this bag?" (point to Actor's bag)

5. "Who gets the Skittles in this bag?" (point to Recipient's bag)

  The order of #4 and #5 was counterbalanced.

6. Free condition: "What happens to the Skittles in this box at the end of the game?" Costly condition: "What happens to the Skittles in this green box at the end of the game?"

7. Costly condition only: "What happens to the Skittles in this red box at the end of the game?"

In the Costly condition, the order of #6 and #7 was counterbalanced in line with the green/red counterbalancing.

If the subject answered question #1 or #2 incorrectly, the experimenter immediately re-explained both the green and red holes and repeated the question. If the subject answered question #4 or #5 incorrectly, the experimenter re-explained who each bag belonged to and then repeated the question. If the subject answered question #6 (or #7 in the costly condition) incorrectly, the experimenter immediately re-explained the fate of the Skittles in the big box (in the Free condition) or in both the green and red boxes (in the Costly condition) and repeated the question.

Test trials

For each trial the experimenter put six Skittles in a line on the platform, and then showed the subject a Skittle card, again with the shaded side oriented toward the Actor's bag and the plain side oriented toward the Recipient's bag. The experimenter asked the child how many Skittles the Actor decided to give to the Recipient, and how many the Actor decided to keep for herself. If the subject answered incorrectly, the experimenter reminded her of the rules of the Skittle cards, and repeated the question. After the subject answered correctly, the experimenter moved the Skittles into the appropriate plastic cup(s), and removed the black stick. The subject then reached into the big hole, pulled out a Skittle, and dropped it through one of the small holes. If the subject dropped a Skittle where she was not supposed to (for example, into one of the Skittle bags or the

plastic cups), which occasionally happened on the first trial, the experimenter reminded the subject that she should drop a Skittle through one of the small holes.

If the subject dropped a Skittle through the green hole, the experimenter dumped the Skittles from the plastic cups into the appropriate Skittle bag(s), and explicitly stated how many Skittles each player got to take home on that trial (zero, three, or six). If the subject dropped a Skittle through the red hole, the experimenter dumped the Skittles from the plastic cups into the black box, and explicitly said that nobody got to take home Skittles from that trial.

Throughout the session, the experimenter kept the pile of Skittle cards off the table and out of sight, so the subject could not see how many trials remained. In the U.S., if the subject correctly answered the questions about how the Actor wanted to distribute the Skittles on the first three trials, the experimenter simply stated the answer on the remaining trials, in order to save time. At the end of each trial, the experimenter replaced the black stick.

There were 12 trials in total in each session. Six trials were equal (3 Skittles for the Actor and 3 for the Recipient) and six were unequal (6 Skittles for the Actor and 0 for the Recipient). The cards were presented in a random order, with the constraint that no more than two cards of the same type be presented sequentially.

Post-test comprehension check

When all 12 trials were complete, the experimenter asked the subject several comprehension questions to ensure that the she had understood the game and remembered the premises:

8. Whose bag is this? (point to Actor's bag)

9. Whose bag is this? (point to Recipient's bag)

> Questions #8 and #9 were counterbalanced in line with questions #4 and #5.

10. What made you decide to drop a Skittle into the green hole?

11. What made you decide to drop a Skittle into the red hole?

> Questions #10 and #11 were counterbalanced in line with green/red

counterbalancing.

After these questions the experimenter dumped all the Skittles from the big box

(in the Free condition) or from the green box (in the Costly condition) into the

subject's Skittle bag.

Debrief

> At the very end of the game, the experimenter asked the subject whether

the other players are "real kids" or "just pictures." Regardless of the child's

answer, the experimenter then debriefed the subject by explaining that we just

pretended that the other players were real kids so that the child could play the

game.

Coding

> In Uganda, I was the secondary experimenter, and live-coded each session

as the research assistant conducted the experiment. I coded the responses to the

comprehension questions, as well as each Skittle distribution and the subject's

subsequent decision. Where necessary, my research assistant live-translated the

responses so that I could record them. A research assistant in the U.S. reliability

coded distributions and decisions from video recordings for 20% of subjects. Agreement between the two coders was high (Cohen's kappa = .98 and .96 for distributions and decisions, respectively).

In the U.S., I live-coded each session as I simultaneously conducted the experiment. A research assistant reliability coded distributions and decisions from video recordings for 20% of subjects. Agreement between the two coders was high (Cohen's kappa = .90 and .94 for distributions and decisions, respectively).

Analysis

I used IBM SPSS® Statistics Version 22 and Excel for all analyses and calculations. I analyzed the data by running a repeated-measures ANOVA, as each subject decided to either accept or reject on each of 12 trials (and rejection was thus a repeated measurement within each subject), using the proportions of trials rejected as the dependent variable, distribution (equal or unequal) as the within-subject independent variable, and cost (costly or free condition) and age as between-subject independent variables. I calculated the proportions of rejections for both equal and unequal distributions by dividing the number of rejections in response to the each distribution type (equal or unequal) by the total number of decisions made for that respective distribution type. All relationships deemed significant were at the .05 level.

We analyzed subjects according to three age groups (6-7, 8-9, 10-11), rather than analyzing age in one-year increments, to make results more robust.

Preliminary Results: Comprehension and Belief

Comprehension

Overall, children seemed to understand the instructions and the premise of the game before they began to play.

In the U.S., children answered the pre-test comprehension questions spontaneously correctly 92% of the time, and after the experimenter re-explained the instructions and repeated the question where needed, all children eventually answered correctly. Children remembered who owned which bag throughout the game, as demonstrated by their post-test comprehension question correct-response rate of 98%.

In Uganda, children answered the pre-test comprehension questions spontaneously correctly 77% of the time, and after the experimenter re-explained the instructions and repeated the question where needed, children eventually answered correctly 96% of the time (in the remaining cases, the children either never answered correctly or a question was omitted). 100% of children eventually correctly demonstrated how to make the Skittles go into the bags and into the black box. Children remembered which bag belonged to which player throughout the duration of the game, as demonstrated by their post-test comprehension question correct-response rate of 92%.

The frequency of each response to the pre-test comprehension questions in each country are given in Appendix B, Table 1a.

Belief

At the end of the game, the children were asked whether the other players were "real" or just pictures." In the U.S., 36% of children (n = 21) believed that the other players were real, and 64% (n = 38) thought that they were just pictures. Ugandan subjects showed a higher belief rate, with 48% of children (n = 41) claiming that the players were real, and 52% (n = 44) saying that they were just pictures.

In the U.S., an independent-samples t-test indicated that there was no significant difference in intervention rates between believers and non-believers (equal distributions: ($t(27)$ = 1.06, p = .30); unequal distributions: ($t(29)$ = -1.79, p = .083)). Similarly, in Uganda, an independent-samples t-test indicated that there was again no significant difference in intervention rate between believers and non-believers (equal distributions: ($t(81)$ = 1.80, p = .076); unequal distributions: ($t(81)$ = .34, p = .74)).

Though many subjects did not believe that two other players had really come in the previous day to play the game, they did not alter their behavior based on this non-belief.

4. Task 2: Hypothetical Scenarios

Apparatus

Task 2 consisted of a series of four hypothetical scenarios presented with small, laminated, color printouts of kids and props, including a fruit basket, a soccer ball, cookies, and peanuts. The experimenter moved the figures around on

the table to illustrate each scenario (as well as verbally narrating it). See Figure 4

for an example of the scenario figures, and see Appendix A, Photographs 3 and 4

for examples of full scenario set-ups.

Figure 2. Figures of girl and a peanut/gnut, examples of scenario figures

Procedure

Task 2 was designed to measure whether children think that an unequal

division of resources is indeed wrong, and whether they deem it appropriate for a

third-party child to intervene in theory, regardless of how they actually behaved in

Task 1.

There were a total of four scenarios: two Equality scenarios and two

Intervention scenarios. The order of presentation of the scenarios was

counterbalanced, with the constraint that the Equality and Intervention scenarios

alternated.

All figures in the scenarios were small, laminated, color printouts. Due to

technological restrictions, the cookie figures used in Uganda were hand-drawn

and covered with transparent tape. The gender of the kids in the scenarios was

matched with the gender of the subject. As the experimenter explained each

scenario, she pointed to the various figures at the appropriate times to make it

clear who did what.

Equality Scenarios

One of the equality scenarios used peanuts and the other used cookies. The experimenter put six peanut/cookie figures in a row on the table. She then pulled out a kid figure and said that she found the peanuts/cookies, and then another kid walked in, at which point the experimenter pulled out another kid figure.

For each equality scenario, the experimenter asked one of two questions:

"Is it ok?" question: The experimenter said that the first kid decided to keep all six peanuts/cookies for herself, and give none to the other kid. The experimenter moved all six peanut/cookie figures to one side to illustrate this. The experimenter asked the subject if that is "ok" or "not ok."

"Show me" question: The experimenter asked the child to show her how the first kid *should* divide the peanuts/cookies between herself and the other kid. The subject then moved the peanuts/cookies around on the table to illustrate how the first kid should distribute them.

Sometimes the "Is it ok?" question was asked with regard to the cookies and the "show me" question was asked with regard to the peanuts, and sometimes vice versa, according to counterbalancing.

Intervention Scenarios

Soccer ball: The experimenter put three kid figures in a row, and two off to the side, a soccer ball figure next to the row of kids. The experimenter told the subject that the three kids were playing with the soccer ball, and one of the kids held on to the ball for a long time and the other kids couldn't play with it (the experimenter put the soccer ball figure in the ball-hog's hands). The experimenter

asked the subject if that is "ok" or "not ok" to verify that the subject did see this action as wrong. The experimenter continued to explain that the first kid figure on the side (the "intervener") was across the playground and saw this transpire, and went over and told the first kid to let the other kids have a turn with the ball (the experimenter moved the intervener so that she was sitting next to the ball-hog). The second kid figure on the side (the "bystander") also saw this transpire, but she stayed across the playground and did not say anything. The experimenter then asked the subject who did the right thing, the intervener or the bystander.

Queue: The experimenter put four kid figures in a row, with a fruit basket figure at the front of the row, and two kid figures off to the side, each holding an apple. The experimenter told the subject that the four kids were waiting in a line to get food, and then the kid at the back of the line moved to the front of the line (the experimenter moved the cutter to the front of the line). The experimenter asked the subject if that is "ok" or "not ok" to verify that the subject did see this action as wrong. Similarly to the soccer ball scenario, the experimenter explained that one of the apple-holding figures already had food but went over to tell the kid to move to the back of the line (the experimenter moved the intervener so that she was sitting next to the cutter), while the other apple-holding figure stayed in her/his seat and did not say anything. The experimenter then asked the subject who did the right thing, the intervener or the bystander.

In one of the Intervention scenarios the intervener was presented first and in the other the bystander was presented first. This order was determined from counterbalancing.

At the end of Task 2, children got to take home their Skittle bag from Task 1, as well as an additional prize to thank them for playing.

Coding

In Uganda, I live-coded responses to each scenario as the research assistant conducted the experiment. Where necessary, my research assistant live-translated the responses so that I could record them. A research assistant in the U.S. reliability coded responses from recorded videos. Agreement between the two coders was high (90%), and in most cases where the two did not agree it was a result of the responses being inaudible in the video recording.

In the U.S., I live-coded each session as I simultaneously conducted the experiment. Due to time constraints and due to the simple nature of this live-coding, no reliability coding was done for Task 2 in the U.S.

Analysis

I used IBM SPSS® Statistics Version 22 and Excel for all analyses and calculations. I analyzed the data by assigning a score of either a 1 or a 0 to each response, and averaging the scores from the two equality scenarios and the scores from the two intervention scenarios. To be consistent, we again analyzed subjects according to three age groups (6-7, 8-9, 10-11).

Results

1. Do Children in the United States and Uganda Engage in Third-Party Intervention?

In Task 1, we investigated children's actual third-party intervention behavior – that is, their tendency to intervene when they witnessed either an equal or an unequal distribution of candy between two other players. We wanted to learn when this behavior emerges during childhood, how children's decisions are affected by cost of intervention, and how third party intervention behavior varies between children in the United States and in Uganda. Figure 5, below, shows intervention behavior of children in both countries.
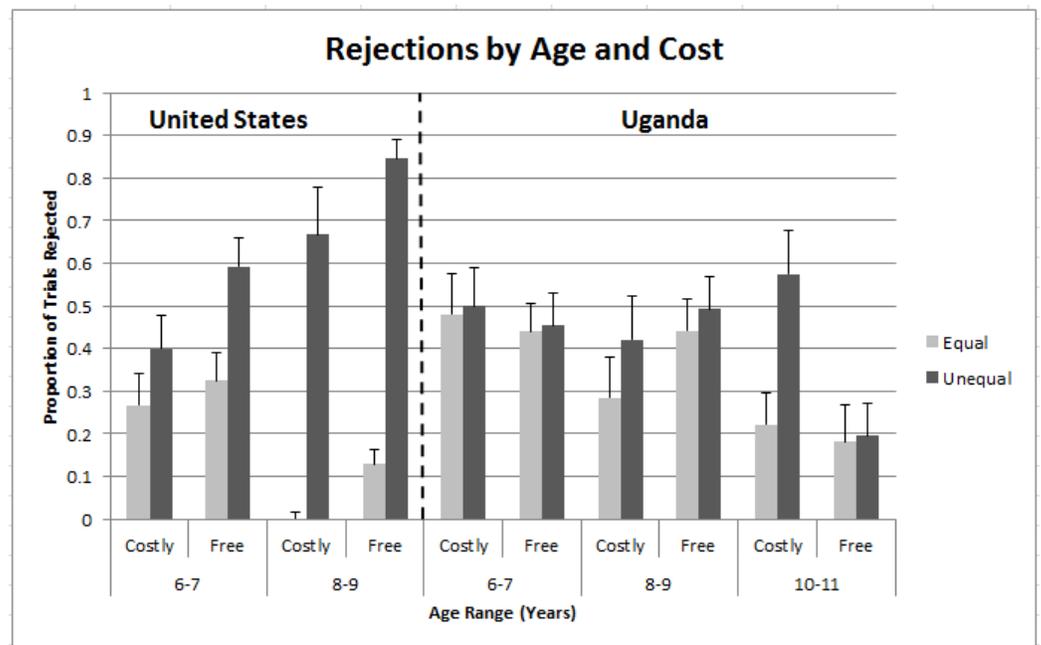
Figure 5. Mean proportions of equal and unequal distributions rejected in each country by age and cost (costly or free). Light gray bars indicate rates at which children rejected (i.e. intervened in) the six equal trials (3-3). Dark gray bars indicated rates at which children rejected the six unequal trials (6-0). Each child was randomly assigned to either the costly or free condition, which determined whether they had to sacrifice one of their own Skittles in order to intervene. Error bars indicate standard error of the mean.

United States Third-Party Intervention Behavior

I began by analyzing data from each location separately. First I will report an analysis of intervention patterns of 6- to 9-year-old children in the U.S., as this is the population in which third-party intervention has been examined by previous studies.

Factors Influencing Intervention Behavior

Main Effects of Distribution and Cost

There was a significant main effect of distribution ($F(1,55) = 89.80$, $p < .001$, $\eta_p^2 = .620$), qualified by a significant distribution by age interaction ($F(1,55) = 26.20$, $p < .001$, $\eta_p^2 = .323$). To investigate the main effect of distribution, we examined bonferroni-adjusted comparisons. U.S. subjects rejected a significantly larger proportion of unequal distributions ($M = .62$) than equal distributions ($M = .20$). This indicates that children were sensitive to equity/inequity of distribution.

There was also a main effect of cost ($F(1,55) = 8.36$, $p < .01$, $\eta_p^2 = .132$). By examining bonferroni-adjusted comparisons, we can see that subjects rejected a significantly larger proportion of trials in the free condition ($M = .47$) than in the costly condition ($M = .33$). This indicates that children in the U.S. were sensitive to cost of intervention.

Interaction of Age and Distribution

The ANOVA revealed a significant distribution by age interaction ($F(1,55) = 26.20$, $p < .001$, $\eta_p^2 = .323$). Children 6-7 years old had a proportion of rejections that was .21 higher for unequal ($M = .51$) than equal ($M = .30$)

distributions, while children 8-9 years old had a proportion of rejections that was .69 higher for unequal (M = .77) than equal (M = .08) distributions. Thus, as children in the U.S. got older, they became significantly more sensitive to distribution equity/inequity.

Interaction of Cost and Distribution

Although there was no significant distribution by cost interaction (F(1,55) = 1.80, p = .185, η_p^2 = .032), Figure 5 suggests that children's intervention behavior did vary by condition. Children in the costly condition had a proportion of rejections that was .33 higher for unequal (M = .49) than equal (M = .17) distributions, while children in the free condition had a proportion of rejections that was .49 higher for unequal (M = .72) than equal (M = .23) distributions. This suggests that children in the free condition were more sensitive to distribution equity/inequity than were children in the costly condition.

Interaction of Distribution, Age and Cost

Although there was no significant distribution by age by cost interaction (F(1,55) = .015, p = .903, η_p^2 = .000), in Figure 5 we observed a pattern that in the U.S. children of all ages are more likely to reject unequal than equal distributions, and are more likely to reject in the free than in the costly condition. As children get older, their likelihood of rejecting unequal distributions goes up, and their likelihood of rejecting equal distributions goes down (overall, the 6-7 year-olds

are only slightly less likely to reject ($M = .40$) than are the 8-9 year-olds ($M = .43$)).

Replicating past observations of third-party intervention in U.S. children

  Our results replicate previous observations of third-party intervention behavior in children in the U.S. (McAuliffe et al., 2015). As I discuss above, we found a main effect of distribution and a main effect of cost on children's rejection rates, and found that as children get older, they become more likely to reject unequal distributions, even when they have to pay a cost to do so. This replication of results suggests that though our experiment used a different apparatus than McAuliffe et al.'s study, our design nevertheless effectively measured third-party intervention behavior.

<u>**Uganda Third-Party Intervention Behavior**</u>

  Here I report an analysis of intervention patterns of 6- to 11-year-old children in Uganda, a population in which third-party intervention has not previously been studied.

Factors Influencing Intervention Behavior

Main Effects of Distribution and Cost

  The ANOVA revealed a significant main effect of distribution ($F(1,80) = 6.84$, $p < .05$, $\eta_p^2 = .079$), and by examining bonferroni-adjusted comparisons, we can see that subjects rejected a significantly larger proportion of unequal

distributions ($M = .44$) than equal distributions ($M = .36$). There was no main

effect of cost, with children in the costly condition rejecting a slightly larger

proportion of trials ($M = .42$) than children in the free condition ($M = .38$).

Interaction of Age and Distribution

      Although there was no significant distribution by age interaction ($F(2,80)$

$= 1.43$, $p = .246$, $\eta_p^2 = .034$), Figure 5 suggests that as children got older, they

showed an increased sensitivity to distribution. Children 6-7 years old had a

proportion of rejections that was .02 higher for unequal ($M = .48$) than equal ($M =$

.46) distributions. Children 8-9 years old had a proportion of rejections that was

.09 higher for unequal ($M = .46$) than equal ($M = .37$) distributions. The oldest

children (10-11 years old) had a proportion of rejections that was .16 higher for

unequal ($M = .36$) than equal ($M = .20$) distributions. Thus, it seems that as

children get older, they become more sensitive to distribution equity/inequity.

Interaction of Cost and Distribution

      Although there was no significant distribution by cost interaction ($F(1,80)$

$= 3.66$, $p = .059$, $\eta_p^2 = .044$), Figure 5 suggests that children's intervention

behavior did vary slightly by condition. Children in the costly condition had a

proportion of rejections that was .14 higher for unequal ($M = .49$) than equal ($M =$

.35) distributions. Children in the free condition had a proportion of rejections that

was .03 higher for unequal ($M = .40$) than equal ($M = .37$) distributions. This

suggests that unlike in the U.S., children in the costly condition may have been

slightly more sensitive to distribution equity/inequity than were children in the free condition.

Interaction of Distribution, Age, and Cost

Although there was no significant distribution by age by cost interaction $(F(2,80) = 1.54, p = .221, \eta_p^2 = .037)$, Figure 5 suggests that different ages showed varying sensitivity to distribution and cost. Here, I will more closely examine the complex effects of distribution and cost for each age group.

In Figure 5, we can see that there does not appear to be much of an effect of either distribution or cost among 6-7 year-olds. 8-9 year-olds start to show a pattern similar to that of 6-7 year-old children in the U.S.; in other words, they are more likely to reject unequal than equal trials, and they are more likely to reject in the free than in the costly condition. Ugandan children in the costly condition show a greater difference in rejection rate of equal vs. unequal distributions as they move from the 8-9 age group to the 10-11 age group (a developmental behavior similar to that of children in the U.S.). Indeed, 10-11 year-olds in the costly condition are much more likely to reject unequal than equal distributions. 10-11 year-olds in the free condition, however, do not follow this pattern. They are unlikely to reject either equal *or* unequal trials. As children go from the 8-9 age group to the 10-11 age group, those in the costly condition become more sensitive to distribution equity/inequity, but children in the free condition do not, but instead show essentially equal rejection rates of equal and unequal distributions. We see a similar pattern begin to emerge among 8-9 year-olds, who

are more sensitive to distribution equity/inequity in the costly than in the free condition. The low level of rejection among Ugandan 10-11 year-olds in the free condition may have been driven by subjects who never intervened at all: 7 of 12 children never rejected equal distributions, and 6 of 12 children never rejected unequal distributions. Five children never rejected at all, and all 5 were in the free condition. Thus, although there was no overall significant distribution by age by cost interaction, it is clear that cost and distribution affected 10-11 year-olds differently than they affected 6-7 and 8-9 year-olds.

Cultural Comparison

Taken together, the above results point to some notable cultural differences between the two countries. With regard to distributions, from ages 6-9, children in the U.S. are more sensitive to equity/inequity of distribution than are children in Uganda, though 10-11 year-old children in Uganda show increased sensitivity to distribution. With regard to condition, from ages 6-9 children in both countries are more likely to reject when they can do so for free (though this effect is only significant in the U.S.), but when Ugandan children ages 10-11 are taken into account, children in Uganda are actually more likely to reject when they have to pay a cost to do so. Overall, children in the U.S. were more sensitive in the free condition, and children in Uganda were more sensitive in the costly condition. While U.S. children showed a greater difference in rejection of unequal vs. equal trials in the free than in the costly condition, Ugandan children showed the

opposite trend, with a greater difference in rejection of unequal vs. equal trials in the costly than in the free condition.

To examine and compare gender effects in both countries, we ran an ANOVA with gender as an added between-subject independent variable. The proportion of rejections for each gender, broken down by country, age group, cost, and distribution is shown in Appendix B, Figure 8. We found that in the U.S. girls were more sensitive to distribution equity/inequity than males, while in Uganda it was the boys who were slightly more sensitive distribution. In addition, in the U.S., we found that the costly vs. free condition differences were more pronounced in girls than in boys. When we looked at rejection rates collapsed across distribution, age, and cost, we found that in both countries males were more likely to intervene than females, but this difference was more pronounced in Uganda.

In order to look more directly at the differences between the two countries, we combined 6-9 year-olds' data from both countries (excluding 10-11 year-olds in order to get a more accurate comparison) and ran a third repeated-measures ANOVA with "country" as an added between-subject independent variable.

Although this ANOVA revealed no significant main effect of country, we were interested in comparing overall rejection rates of the two countries. In the U.S., the overall mean rejection rate was .41, while Uganda, the overall mean rejection rate was .44, indicating that children in both countries were willing to intervene, with children Uganda being slightly more likely to do so.

This ANOVA revealed a significant distribution by country interaction ($F(1,116) = 40.13$, $p < .001$, $\eta_p^2 = .257$), and a significant three-way distribution by age by country interaction ($F(1,116) = 10.80$, $p = .001$, $\eta_p^2 = .085$). Among U.S. children, the difference in rejection rate (calculated by subtracting the mean equal rate from the mean unequal rate) increases by .42 as children move from the 6-7 to the 8-9 age group. Among Ugandan children, this difference increases by only .07, and even when 10-11 year-olds are taken into account, this difference only increases by .14. Thus, we can see that in both countries, sensitivity to distribution increases with age, but this effect is more dramatic in the U.S. population.

Decision Strategies and Phenotypes

What strategies do children use to make their decisions? To better understand the decision strategies and patterns of each child, we categorized children into three rejection phenotypes: those who rejected more equal than unequal distributions, those who rejected the same number of equal and unequal distributions, and those who rejected more unequal than equal distributions. The frequency of these phenotypes, divided by country and age, are shown in Figure 6. In the U.S., there were more children who fell in the "reject more unequal" phenotype than in the "reject more equal" phenotype, and the number of children in the "no difference" phenotype was somewhere in between (though 8-9 year-olds almost all fell into the "reject more unequal" phenotype). In Uganda, this pattern holds with only the 10-11 year-olds. 6-9 year-olds were more likely to fall in the "no difference" phenotype than in either of the other two phenotypes,

suggesting that children in Uganda became sensitive to distribution

equity/inequity later than did children in the U.S.
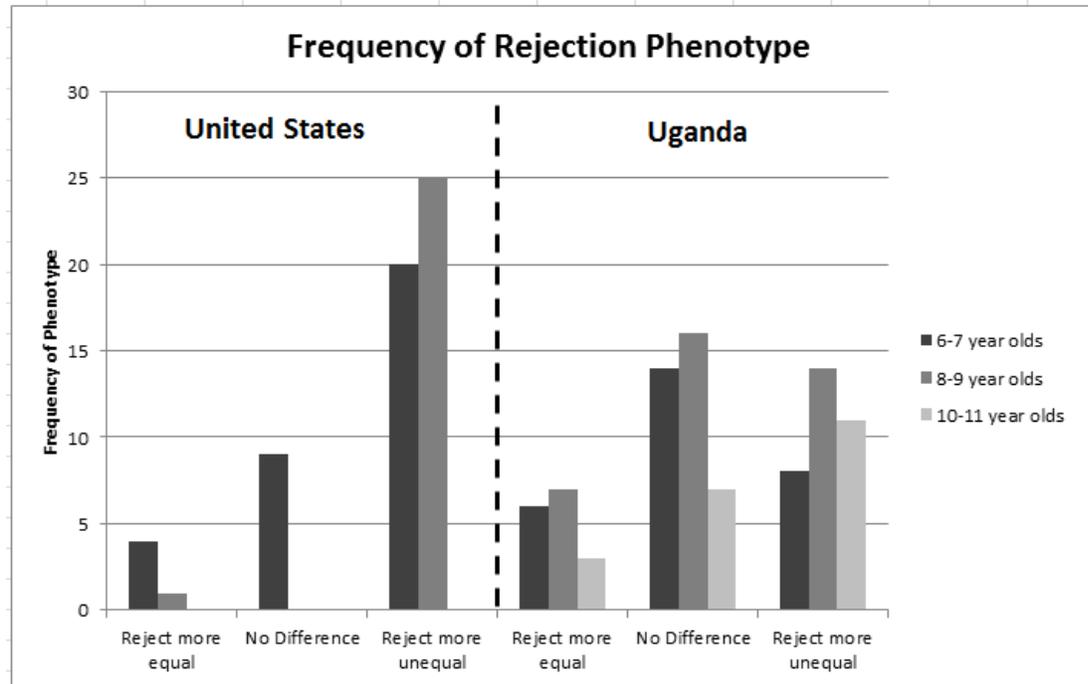
Figure 6. Frequency of rejection phenotypes by country and age. Children who rejected more equal than unequal distributions fell in the "Reject more equal" phenotype, children who rejected the same number of equal and unequal distributions fell in the "No Difference" phenotype, and children who rejected more unequal than equal distributions fell in the "Reject more unequal" phenotype. Following Jordan (2013).

While some children showed systematic patterns of accepting or rejecting

distributions, we observed that some children appeared to just alternate between

accepting and rejecting. To identify these different strategies, we defined an

"alternator" as a child who switched back and forth most of the time, i.e. never

making the same decision more than twice in a row, and never making the same

decision twice in a row more than twice.

We found that in the U.S., 8.5% of children (n = 5, all male) employed the

alternating strategy. In Uganda, 19.5% of children (n = 17, 11 females and 6

males) employed the alternating strategy. It is unclear why these children chose to

alternate, but it is clear that this was a much more popular strategy in Uganda than in the U.S.

Free Response Questions

What reasoning do the children provide for their own decisions? By examining children's answers to the post-test free response questions ("Why did you decide to put a Skittle into the green/red hole?"), we can gain valuable insight into why the children made the decisions that they did. Specifically, by looking at these responses, we were interested in whether children were concerned with fairness norms.

In the U.S., a large proportion of children – 49% (n = 29) – spontaneously used the word "fair" or "unfair" in their post-test responses. In Uganda, only 3% (n = 3) spontaneously used the word "fair" or "unfair." It is possible that this low rate was due to the children's answers being "lost in translation," but this seems unlikely as there were a few children who did reportedly use the words "fair" and "unfair." A much more common answer to these questions in Uganda was to state literally what happened when a Skittle was dropped into each hole (for example, "[the Skittles] go into the bags" or "neither of [the other players] could take them"). While it is clear that many of the U.S. children were considering fairness norms in their decisions, we cannot say for certain whether the Ugandan children were or not, as their answers mostly refer to the literal outcome of the decision, rather than their thought process leading up to it.

The results from Task 1 reveal the extent to which children engage in third-party intervention, but it is possible that children have a stronger conceptual understanding of norms than their actual behavior would lead us to believe.

2. Does Children's Behavior Mirror Their Conceptual Understanding of Norms?

In Task 2, we investigated how children think about hypothetical equal/unequal distributions and third-party intervention behavior – that is, what action they *report* as the right thing to do, when they themselves don't have to actually *do* it. Table 2 gives the scoring (1 or 0) to the answer of each of the four scenario questions (including two equality scenarios and two intervention scenarios).

Do children think that resources should be distributed equally, and do they think that it's good to intervene to right a wrong? To measure this, responses to each of the four scenarios were assigned values of 1 or 0. In the equality scenarios, a child received a 1 if she stated that it was "not ok" for a girl to keep all 6 treats for herself (and received a 0 if she stated that it was "ok"), and a child received a 1 if she indicated that a girl should divide up treats equally between herself and another girl (and received a 0 if she indicated an unequal distribution). In both intervention scenarios, a child received a 1 if she stated that the intervener did the right thing (and received a 0 if she instead preferred the bystander). An overall Equality Score (ES) and Intervention Score (IS) was calculated for each child by averaging her responses to the two equality scenario and two intervention scenarios, respectively. Thus, each child's ES and IS ranged from 0 to 1. A child who firmly believed that resources should be distributed equally and that it is right to

intervene would receive and ES and IS of 1. Children's mean ES and IS in each country are shown in Figure 7.
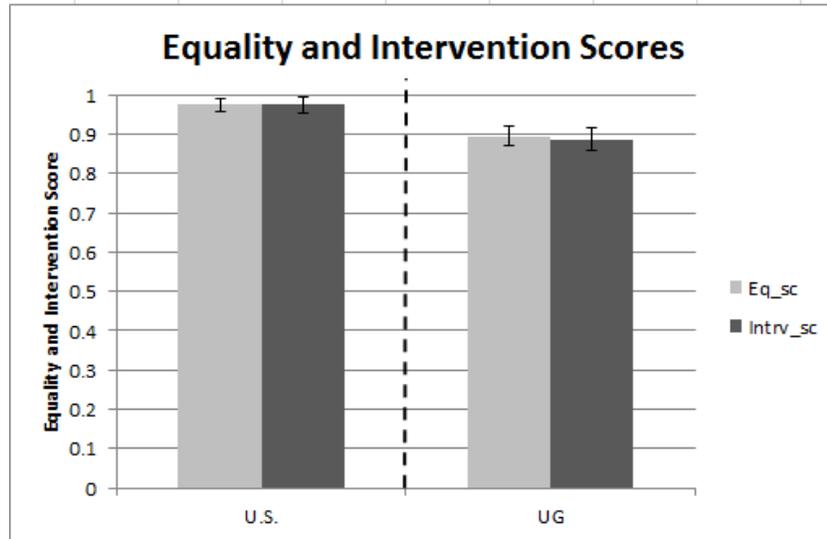

Figure 7. Mean Equality and Intervention Scores by country. Light gray bars indicate Equality Score, dark gray bars indicated Intervention Score. Each child responded to two equality scenarios and two intervention scenarios, and the average of each pair of answers was the child's Equality and Intervention Score, respectively. Error bars indicated +/1 standard error of the mean.

In both countries, children had both ES's and IS's close to 1, indicating that equal distributions and third party intervention (at least as presented in the scenarios) were the cultural norms in the U.S. and Uganda. However, an independent-samples t-test indicated that scores for both categories were significantly higher in the U.S. than in Uganda (Equality: $t(134) = -2.84, p < .01$); Intervention: $t(133) = -2.53, p < .05$), indicating that perhaps these norms are stronger in the U.S., or perhaps just that children in the U.S. (6-9 years old) hold to these norms more strongly than do children in Uganda (6-11 years old).

We thought it possible that children who did not reject unequal trials in Task 1 may have low ES's, and children who did not intervene in Task 1 may have low IS's. It's true that some subject with an ES of <1 never rejected unequal

distributions in Task 1 (as one may expect of children who don't mind inequity), but many others did (in fact, both subjects in the U.S. with an ES of <1 rejected unequal distributions at high frequencies). There were several subjects in each country who had an IS of <1, and did not reject in Task 1 (as one may expect of children who don't believe in third-party intervention). However, many of those with IS of <1 did reject frequently in Task 1. For each subject, ES and IS do not seem to predict intervention rates in Task 1. This is evidence that the way children think about hypothetical equal/unequal distributions and third-party intervention does not necessarily reflect their actual behavior (particularly in Uganda, where the mismatch between responses in Task 1 and Task 2 are especially dramatic).

Discussion

Summary of Results

In this study, we examined and compared the development of third-party intervention behavior of children from two distinct locations: a large city in the United States, and a group of small towns and villages in western Uganda. In the first task, we investigated children's tendency to intervene, even when they had to pay a cost to do so, when they witnessed an equal or unequal distribution of resources between two other (absent) players. In a second task we investigated children's approval and disapproval of *hypothetical* distribution and third-party intervention scenarios.

We found that there is indeed a cultural difference in the way children engage in third-party intervention. Children in the U.S. were more likely to intervene when the candy was unequally distributed than when the candy was equally distributed, and this trend was even more dramatic in 8- to 9-year-olds than in 6 to 7 year-olds. This trend held both when children had to pay a cost in order to intervene, and when they could do so for free. Ugandan children rejected more unequal than equal overall, but their rejections were not strongly influenced by age. There was, however, a trend in the data suggesting that this pattern of intervention was only true of Ugandan children when they had to pay a cost in order to intervene. When intervention was free, children in Uganda tended to reject equal and unequal distributions at relatively constant rates, and in this condition 10- to 11-year-olds were less likely to intervene than 8- to 9-year-olds.

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When it came to answering questions about hypothetical scenarios, the vast majority of children in both cultures said that treats should be divided equally, and that intervening when one witnesses an infraction is the right thing to do.

Here, I will discuss the cross-cultural differences and similarities of development of sensitivity to equal and unequal resource distributions, development of sensitivity to cost of intervention, and the relationship between actual and hypothetical third-party intervention. I will conclude by discussing limitations of the current study and suggesting future directions for third-party intervention research.

Development of Sensitivity to Distributional Equity and Inequity

As I hypothesized, in both cultures, children rejected unequal distributions more than equal distributions. Indeed, across cultures, ages, and conditions, children were more likely to reject unequal than equal trials. This suggests that children in both of these cultures hold a fairness norm that says when a child is given a collection of treats, she should split them equally between herself and others.

I hypothesized that Ugandan children may reject equal distributions at similar rates as U.S. children, but would be less likely than U.S. children to reject unequal distributions. This was partially true – across most age groups and conditions, Ugandan children actually rejected more equal distributions than U.S. children did, but they also generally were less likely than U.S. children to reject

unequal distributions. Below I present two possible explanations, which are not mutually exclusive, for this observation.

Most immediately, it may be because children in Uganda live in a culture in which adults have complete authority, and children are extremely subordinate. Therefore, it may be a foreign concept for these children to be told that they get to decide whether or not to let other children have treats or not, especially while the experimenter – an adult – is present and watching. Perhaps these children compromised between following the norm of enforcing equality (rejecting unequal distributions and accepting equal distributions), and following a different norm – the norm of "abdicating power," and playing it safe by not taking a strong stand for or against equal or unequal distributions (in fact, 19.5% of children alternated between accepting and rejecting). I gathered from personal observations that classroom lessons do not emphasize critical thinking the way that many modern classrooms in the U.S. do, but rather are based on teachers dictating facts and answers to questions, and students memorizing these answers. Based on these observations, I think it even more likely that children in Uganda wanted to follow the "abdicate power" norm, because they saw it as not only a norm, but as the "right answer," and they were eager to show the adult experimenter that they were able to demonstrate this "right answer."

My second possible explanation for the comparatively low rates of rejection of unequal distributions in Uganda compared to the U.S. is that these children come from a smaller society. This is consistent with the idea that since small societies are largely based on kinship ties and personal reciprocity, their

norm enforcement relies more on second-party punishment and less on third-party intervention (Henrich et al., 2010b; Marlowe et al., 2008). One reason that we may expect *more* third-party intervention in Uganda is because there is less of an official police presence (especially in the small towns, where the nearest police station is a 20 minute motorcycle ride away). I would argue that this is a fair hypothesis for adult behavior of third-party intervention, but that children's subordinate position in society has a greater effect on their intervention behavior than the absence of official law-enforcement.

These results raise a number of additional questions about third-party intervention behavior.

First, why is it that children in the U.S. ever reject equal distributions? This is a surprising result given that (1) children in the U.S. showed a clear trend of intervening more when the Actor kept all the Skittles for herself, and (2) a large proportion of them reported in the free-response questions that they made their decisions based on fairness and equality. I suspect that this is largely because the children wanted to explore their options, and see what would happen if they made different decisions in response to different distributions. I also suspect that after some children accepted an unequal distribution, they were hoping for a distribution that gave 6 to the receiver and 0 to the Actor in order to even out the total.

Second, in Uganda, why don't the 6 to 7 year-olds show much of a pattern at all, and reject all distributions at close to chance proportions? I suspect that

children in this young age group were following the "abdicating power" norm, as discussed above.

This begs the question, why do 8- to 11-year-old children show a different pattern of intervention than 6- to 7-year-old children? That is, if young children are in the habit of abdicating power, what is it about older children that makes them reject more unequal than equal distributions (especially in the costly condition), rather than intervening at chance, as the 6- to 7-year-olds do? I suggest that this is because older children, in compromising between the norms of abdicating power and engaging in third-party intervention, sway more toward the latter. Older children have more experience being in a position of authority than do younger children, and they also engage in a bit more critical thinking in the classroom and in extracurricular activities such as debate tournaments and wildlife clubs.

Third, why is it that while 8- to 9-year-olds in Uganda showed increased sensitivity to distribution equity and inequity, 10- to 11-year-olds show overall low rates of rejection, with the exception of those rejecting unequal distributions in the costly condition? I suggest that this may be because by this age, children often have many younger siblings at home whom they help to care for, and so by age 10 or 11 they are in the habit of making sure everyone has food, even if that means food won't be distributed perfectly equally. This does not explain the 10- to 11-year-olds' high rate of rejection of unequal trials in the costly condition, however. Below, I will discuss this question, as well as other cost effects on intervention behavior.

Development of Sensitivity to Cost of Intervention

I hypothesized that Ugandan children would be less deterred by the cost of rejection than U.S children would be. This hypothesis was supported, as cost only significantly impacted children's decisions in the U.S., and 10- to 11-year-olds in Uganda were actually more likely to intervene in the costly condition. This may be because these children were trying to abdicate power, and "play it safe" by avoiding making any authoritative decisions, but it may also be because children in Uganda live in a more collectivist culture that places a greater emphasis on personal interdependence, whereas the culture of the U.S. puts a greater emphasis on personal gain (or avoiding personal cost).

I also hypothesized that in both the U.S. and Uganda, younger children would be more deterred by cost than older children. This hypothesis was not supported. First, in the U.S., 6- to 7-year-olds and 8- to 9-year-olds showed about the same sensitivity to cost when it came to rejecting unequal distributions, and older children were more deterred by cost than the younger children when it came to rejecting equal distributions. Second, in Uganda, 6- to 7-year-olds were not deterred at all by cost, but 8- to 9-year-olds were slightly deterred. Perhaps this is not a result of increased stinginess of 8- to 9-year-olds, but simply a result of 6- to 7-year-olds "playing it safe," in both the costly and free condition. Third, 10- to 11-year-olds are not deterred by cost when it came to rejecting equal distributions, but they were in fact *more* likely to reject unequal distributions when they had to pay a cost to do so. These results raise an important question.

Among the Uganda 10- to 11-year-olds, why is it that they intervene strongly against unequal distributions only in the costly condition, and that of the five who accepted every distribution, all of them were in the free condition? I suggest that perhaps the 10- to 11-year-olds were rejecting unequal distributions not necessarily to even out the score, but rather to send a message to the actor that being selfish is unacceptable. This is consistent with the fact that, as I discuss above, by this age children often have a responsibility to care for younger siblings, and so they may be in the habit of communicating such messages. It is also possible that these children were intending to send a message to the experimenter (rather than to the actor), proving that they will intervene when they witness an unfair situation. These children may have thought that they could only effectively send this message when they paid a cost to do so – in a sense, they were putting their money where their mouths are, and showing that they had earned their authority. The children may have thought that if they had rejected freely, they would be acting with unfounded power, and their message would not be taken seriously. This hypothesis about concern for sending a message, rather than concern for the total amount of Skittles, may also explain the very low rates of rejection among 10- and 11-year-olds of both equal and unequal distributions in the free condition (and this hypothesis is not mutually exclusive with the above hypothesis that these older children want to ensure that all the players get some food, regardless of equality).

I had hypothesized that overall, these two populations would show a difference in their tendency to intervene. Whatever the reasons behind the

differences in intervention behavior between these two populations, with regard to sensitivity both to resource distribution and cost, it is clear that my hypothesis was supported. The development of third-party intervention is clearly influenced by cultural norms, though there are some similarities between these two cultures in developmental trends of this behavior.

Hypothetical Scenario Responses vs. Actual Behavior

The results from the second task support my hypothesis that children's responses to the hypothetical equality and third-party intervention scenarios would show less variance between cultures than their actual behavior. Though children in Uganda scored significantly lower on both hypothetical equality and intervention than children in the U.S., the average scores in both countries were very high (above 85%). This is an important finding, and suggests that the cultural differences in third-party intervention may not arise from differences in moral reasoning, but rather from differences in understanding of when those morals should be enforced and who should enforce them. The results also support my hypothesis that children, especially younger ones, would "talk the talk" when it came to hypothetical equality and intervention tasks more than they would "walk the walk" in the actual third-party intervention task.

Why is it that children *say* that third-party intervention is good in Task 2, but don't always *act* on it in Task 1? Smith et al. (2013) found similar results in their second-party sharing study on the development of fairness norms, and concluded that though children begin to internalize fairness norms at a very young age, older children put much more weight on this norm, and are more willing to

suffer a personal cost in order to uphold it. I use similar logic to explain the incongruity in our study between responses to hypothetical scenarios and actual behavior – children of all ages, in both cultures, expressed understanding of the norm of equal distributions and the norm of third-party intervention, and these norms were increasingly reflected by actual behavior over the course of development (with the exception of Ugandan 10- to 11-year-olds in the free condition, as discussed above). In Uganda, there was likely the additional factor that when the situation was hypothetical, children felt comfortable asserting that treats should be distributed equally and third-parties should intervene, because they did not have to compromise between following the fairness/intervention norms and the "abdicating power" norm, as they did in Task 1.

Limitations

Some limitations arise by virtue of the cross-cultural design of this study. One such limitation was the use of Skittles as the valuable resource. Ugandan children are not familiar with Skittles, and so perhaps using a food that the children are familiar with would be more suitable. I argue, however, that Skittles were an appropriate valuable resource, as it has been shown in the past that children in Uganda prefer Skittles over the common ground-nuts (Bowie, 2013). In addition, before the game started, all Ugandan children were given a Skittle to sample, and all reported that they liked it.

Another limitation that arose by virtue of the cross-cultural design of the study was that the experiments took place in two different environments: experiments in the U.S. were conducted in a lab, while experiments in Uganda

were conducted in schools. A lab setting can be more experimentally controlled, as there is less anonymity in a school, and it is possible that children heard about the game before they participated. It is also possible that there was an audience effect in Uganda, as during recess it was impossible to stop children from watching the experiment through the open-air windows of the schoolroom. I do not believe that the audience significantly impacted children's intervention decisions, however, as it would have been nearly impossible for the onlookers to hear the instructions to the game, and therefore they would have no way of understanding or judging the participants' decisions. In fact, audience effect is more of a concern in the U.S. lab setting, where children were aware that their parents were watching the game on a computer monitor from a separate room. Though the watching parents may have impacted children's decisions, this factor is consistent with the experimental methods of McAuliffe et al. (2015), whose study I was attempting to replicate.

Future Directions

There are many ways that the finding in the current study could be expanded upon. One of the complicating factors in our study design was that while an adult experimenter was present to oversee the subject's intervention behavior in Task 1, there were no adult characters present in the Task 2 scenarios. It is therefore possible that the two tasks measured slightly different intervention norms, as children may think it more appropriate for a child to engage in third-party intervention when there is no adult present. To account for this complication, I would recommend that future studies include a teacher or another

adult character in the hypothetical intervention scenarios. If the children's rate of approval of intervention goes down when there is an adult character present, this may indicate that even when thinking hypothetically, children have a norm of deferring to adult authority rather than stepping up to intervene.

Another limitation of our study was that children may have made decisions based on what they thought the experimenter would approve. To address this concern, future studies could use a method in which the experimenter cannot see the children's decisions in Task 1. I would predict that this would have a a especially strong effect on rejection decisions of Ugandan children, who would not only feel less pressure to do what is "correct" in the eyes of the adult experimenter, but also may feel less inclined toward the "abdication of power" norm and sway more toward the third-party intervention norm.

In order to understand third-party intervention more broadly, future studies should investigate intervention in situations that involve some other misdeed beside selfishness. For example, subjects could witness one child saying mean things about another or one child grabbing a toy that another child is playing with. It is important that the methods of these future experiments make third-party intervention costly for the subject. If it turns out that children do intervene in such real-life situations, it would be evidence for third-party intervention as a strongly held norm of behavior that extends beyond situations of distributional inequity. Such experiments could also provide new insight into how exactly third-party intervention is carried out in different cultures, and in these

different cultures what is and is not considered an infraction worthy of intervention.

For the current finding to be placed in a larger cultural context, future studies should investigate the third-party intervention behavior of adults specifically in the area around Fort Portal. If adults in this population engage in third-party intervention significantly more than school-age children, this would support my "power-abdication" hypothesis presented above by showing that the norm of refraining from acting with authority applies only (or especially) to children in this culture, and therefore adults can instead behave according to the third-party intervention norm.

The current study looked at this behavior in one WEIRD (Western, Educated, Industrialized, Rich, and Democratic) population (Henrich et al., 2010a) and in one small, rural, very poor population, but future studies should examine populations that mix and match these criteria; examples could include Dubai (which is middle-eastern and highly industrialized), southwest Detroit, Michigan (which is industrialized but very poor and largely non-white, though certainly shares a great deal of cultural norms with Cambridge, MA), or the capital of Uganda, Kampala (which is a much larger and more industrialized city than the small western towns where we conducted the present study, but still very poor compared to most western cities and shares at least some cultural norms with the small western towns). Conducting future studies in these countries would help to tease apart the effects of community size, industrialization, wealth, and other

cultural factors as they influence the development of third-party intervention behavior.

Finally, I think it's highly important that future cross-cultural studies, not only of third-party intervention but of other behaviors as well, are designed as collaborations between researchers in all countries involved. Researchers in the west (myself included) often conduct cross-cultural studies and then ponder over and draw conclusions about the behavior of people whose cultures they have very little experience with. I have no doubt that our understanding of third-party intervention, and all other culturally-influenced behaviors (which is to say, almost all human behaviors), would benefit drastically from not only more cross-cultural studies, but more cross-cultural collaborative analyses of the findings.

Conclusion

This study adds to the existing body of research on the development of third-party intervention behavior in that it is the first study to examine such behavior cross-culturally. In this study, I investigated the third-party intervention behavior of children in the United States (6- to 9-years old) and in Uganda (6- to 11-years old) using a Skittle distribution task. In a second task, I looked at children's endorsement of equal distributions and third-party intervention in hypothetical scenarios. I found that children of all ages in the U.S. were significantly more likely to reject unequal than equal distributions, and this difference in rejection rate increased as children got older. Children of all ages were also significantly more likely to intervene when they could do so for free, as opposed to when they had to pay a cost to do so. In Uganda, children began to show a sensitivity to distribution equality and inequality at a later age, and this differentiation appeared only in the costly condition. In the second task, children from both countries and of all ages showed a strong preference for equal distributions and third-party intervention, though the U.S. children's preferences were significantly stronger than those of the Ugandan children.

I suggest that Ugandan children demonstrated markedly different patterns of intervention than U.S. children because they were compromising between two norms: (1) a third-party intervention norm, which dictates that they should intervene when witnessing a misdeed, and (2) a "power abdication" norm, which dictates that they should refrain from taking a stand one way or the other (perhaps because an adult experimenter was present). This interpretation is supported by

the fact that we see increased differentiation between equal and unequal distributions as children grow older, and thereby gain more authority. I also suggest that Ugandan children's low rejection rate of unequal distributions compared to that of U.S. children may be due to the smaller society's decreased reliance on third-party intervention. Additionally, their comparatively low sensitivity to cost may be due to the collectivist nature of the society.

By examining populations from two distinct cultures, this study reveals that third-party intervention is not a behavior that all children are born with; rather it is a behavior that is shaped heavily by culture. Human behaviors, however, are generally shaped by combination of biological and cultural evolution (Henrich et al., 2010a). It is therefore plausible that humans have evolved some basic tendency for third-party intervention, as norm enforcement is crucial to the functioning of every human society (Fehr and Fischbacher, 2004), and it is culture that then determines the norms of who in the society should intervene, and in what contexts and to what extent such intervention is appropriate.

Just as it is important to refrain from drawing sweeping conclusions about a human behavior from a study of one population, it is similarly important to recognize the limitations even of cross-cultural studies. The findings of this study cannot be used to make generalizations about the third-party intervention behavior of children in North America vs. Africa, or WEIRD societies vs. collectivist societies, or even all U.S. children vs. all Ugandan children. Cross-cultural research on the development of third-party intervention has just begun. Future research should continue to investigate the development of this behavior in

societies across the world, both in a focused attempt to understand the origins of our similarities and our differences when it comes to intervention, and in a broader attempt to understand the diversity of norms that govern life in human societies.

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Appendix A: Study Material Photographs

Photograph 1. Uganda bags for absent players

Photograph 2. U.S. bags for absent players

Photograph 3. First stage of Cookie Equality Scenario

Photograph 4. First stage of Queue Intervention Scenario

Appendix B: Pre-Test Comprehension Question Responses

U.S.: Pre-Test Comprehension Question Responses				
	Spontaneously correct	**Eventually correct**	**Never correct**	**Omitted**
Practice Trial: If you want the Skittles to be put into the bags? (demonstrate)	46	13	0	0
Practice Trial: If you want the Skittles to be put into the black box? (demonstrate)	55	4	0	0
If you want the Skittles to go into bags? (explain)	55	4	0	0
If you want the Skittles to go into the black box? (explain)	57	2	0	0
Did the other players take home Skittles yesterday?	54	5	0	0
Actor's bag?	58	1	0	0
Recipient's bag?	58	1	0	0
Costly condition: What happens to the Skittles in the green box?	23	2	0	0
Costly condition: What happens to the Skittles in the red box?	22	3	0	0
Free condition: What happens to the Skittles in the box?	31	3	0	0

Table 1a

Uganda: Pre-Test Comprehension Question Responses				
	Spontaneously correct	**Eventually correct**	**Never correct**	**Omitted**
Practice Trial: If you want the Skittles to be put into the bags? (demonstrate)	59	28	0	0
Practice Trial: If you want the Skittles to be put into the black box? (demonstrate)	75	12	0	0
If you want the Skittles to go into bags? (explain)	70	13	2	2
If you want the Skittles to go into the black box? (explain)	72	12	1	2
Did the other players take home Skittles yesterday?	50	25	4	8
Actor's bag?	78	6	0	3
Recipient's bag?	78	6	0	3
Costly condition: What happens to the Skittles in the green box?	21	21	0	1
Costly condition: What happens to the Skittles in the red box?	33	8	1	1
Free condition: What happens to the Skittles in the box?	34	8	0	2

Table 1b

Table 1. After explaining instructions, but before beginning the game, the experimenter asked the subject a series of comprehension questions to ensure that she understood the game. Table 1a gives the number of children who answered each question correct spontaneously on the first try, eventually correctly after the experimenter re-explained the instructions, or never correct, and also the number of subjects for which the question was omitted due to experimenter error. Table 1b gives the same, for children in Uganda.
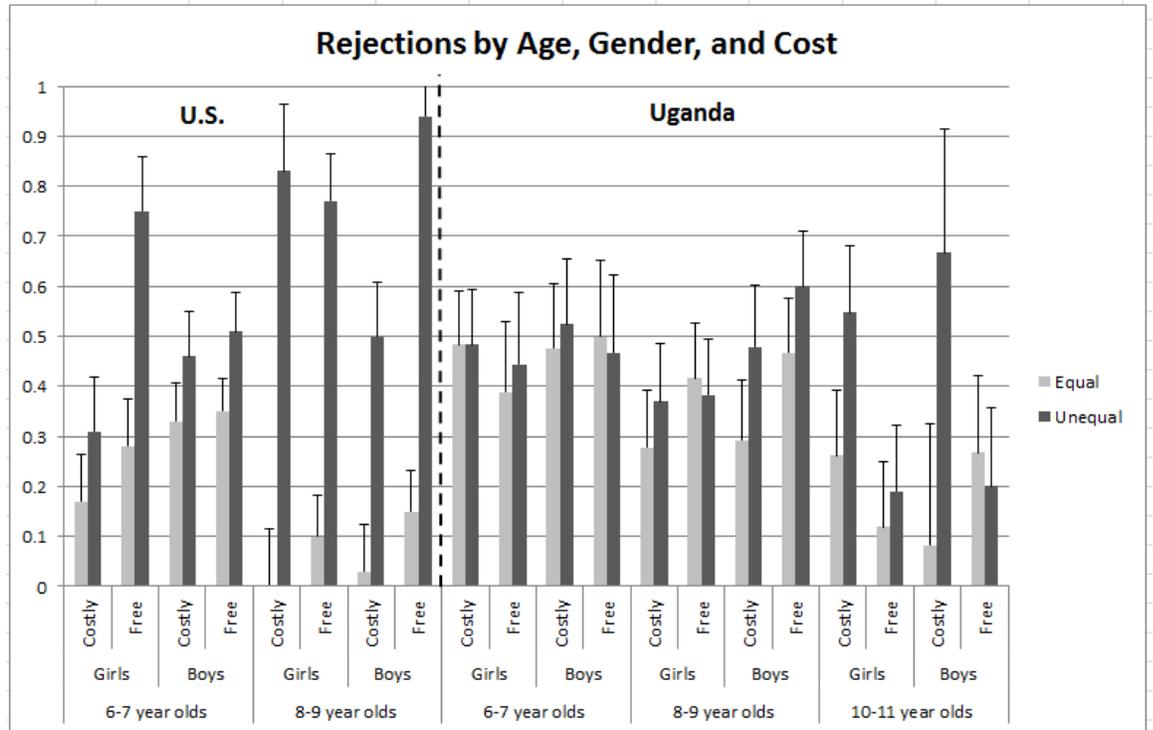
Figure 8. Mean proportions of equal and unequal distributions rejected in each country by age, gender, and cost (costly or free). Light gray bars indicate rates at which children rejected (i.e. intervened in) the six equal trials (3-3). Dark gray bars indicated rates at which children rejected the six unequal trials (6-0). Error bars indicate standard error of the mean.