

ABSTRACT

Title of Dissertation: CHILDREN'S UNDERSTANDING OF MERIT
IN FAIR RESOURCE ALLOCATION

Jee Young Noh, Doctor of Philosophy, 2017

Dissertation directed by: Professor Melanie Killen, Human Development
and Quantitative Methodology

While previous studies have documented children's consideration of merit in fairness decisions, less is known about specifically *how* merit has been conceptualized by children, as effort and outcome were confounded in merit (Baumard et al., 2012; Kienbaum & Wilkening, 2009). Thus, the current study aimed to disentangle these two components of merit in understanding children's conceptions of fairness.

One hundred children (3 to 6 year-olds and 7 to 10 year-olds) participated in this study. Children's understanding of merit was documented in four contexts: a) when effort and outcome were confounded (baseline), b) when outcome was controlled (i.e., when the level of effort was varied), c) when effort was controlled (i.e., when the level of outcome was varied), and d) when given the opportunity to prioritize either effort or outcome.

Novel findings were that with increasing age, children prioritized effort over outcome and thus found it to be fair when more resources were allocated to the hardworking peer than to the productive peer. That is, older children were more likely to focus on the positive intentions of an act rather than positive consequences compared to younger children. In addition, when merit was examined when effort and outcome was controlled, children were still able to take into consideration for merit, thereby allocating more resources to a peer who was hardworking over a peer who was lazy (when outcome was the same) and to a peer who was productive over a peer who was unproductive (when effort was the same).

Interesting findings were revealed when authority figures' messages were present: all-aged children rejected a teacher's allocation decision that was against merit; however, older children rejected a teacher's *equal* allocation decision while younger children found a teacher's *equal* allocation to be okay. The current study made a significant contribution to the current literature by examining the process in which children integrate two different aspects of merit in their fairness decisions.

CHILDREN'S UNDERSTANDING OF MERIT IN FAIR RESOURCE
ALLOCATION

by

Jee Young Noh

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Advisory Committee:

Professor Melanie Killen, Chair
Assistant Professor Lucas Butler
Professor Natasha Cabrera
Assistant Professor Richard Prather
Associate Professor Richard Shin, Dean's Representative

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Dedication

I dedicate my dissertation to my truly amazing husband, Taeuk Moon and our lovely daughter, Seyeon Stella Moon. Without the love, support, and encouragement from my husband, I would not have made this way through. I feel so lucky to have met you in my life. Seyeon, you are the best thing that could ever happen to me. I love you both, more than words can express.

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CHAPTER 1

Introduction and Study Rationale

From an early age, children make decisions that reflect concerns about others' welfare (Jambon & Smetana, 2014; Killen & Rutland, 2011; Vaish, Carpenter, & Tomasello, 2009). Children gradually learn how people should treat one another from their everyday social interactions, and these lessons make up an essential component of morality (Smetana, Jambon, & Ball, 2014). The treatment of others involves important moral issues such as how and whether to fairly distribute a limited number of resources and to deny monopolization of resources (Turiel, 1983). To fully investigate this issue, it is important to examine how children's sense of distributive justice (i.e., allocation of limited resources) develops with age.

There is a long history of research regarding children's distributive justice. For example, Piaget (1932) and Damon (1977) have demonstrated that children's concept of fairness matures with age in their resource allocation decisions. Both theorists argued that children mature from focusing on strict equality (dividing resources equally regardless of the situation) or self-interest (giving more to themselves) to considering more cognitively complex principles of justice, such as recipients' need and merit.

Along with theoretical propositions, empirical research also has provided evidence that children develop their conception of fairness with regard to resource allocation as they mature. For instance, young children strongly advocate strict equality at an early age (e.g., 3 to 4 years) and judge that equal allocations are fair in most contexts (Damon 1977; Olson & Spelke, 2008; Warneken, Lohse, Melis, & Tomasello, 2011). However, with age, children gradually understand that unequal allocations are necessary to ensure fairness in some situations by developing "equity-based concerns", such as merit, need, and pre-existing inequalities (Rizzo & Killen, 2016). Thus, with age, children are more likely to deviate from

equality in their giving by distributing more resources to someone who deserves more resources, derived from concerns on merit (Kienbaum & Wilkening, 2009), to someone who needs more resources (Kenward & Dahl, 2011; Li, Spitzer, & Olson, 2014; Sigelman & Waitzman, 1991), or to someone who has limited access to resources (Rizzo & Killen, 2016).

Among these equity-based concerns, the current study aimed to focus on how children with age increasingly incorporate *merit* in their fair distribution decisions. As merit reflects deservingness based on an individual's contribution, the construct of merit includes the components of effort (i.e., how hard someone works) and outcome (i.e., the results that someone produces) (Carson & Banuazizi, 2008; Kienbaum & Wilkening, 2009). Numerous studies have demonstrated that children increasingly incorporate merit as they age (Rizzo et al., 2016; Schmidt et al., 2016). That is, while studies on young children have some mixed findings on to what extent children understand merit, children aged 7 to 8 year-olds or more are found to demonstrate that merit is a legitimate reason to deviate from equal distribution across contexts (Baumard et al., 2012; Schmidt, Svetlova, Johe, and Tomasello, 2016).

While extensive research has focused on children's understanding of merit in resource allocation, what remains to be investigated is whether children place more value on the "effort" or the "outcome" aspects of merit in their distributive fairness decisions. Most, if not all, previous empirical studies have examined situations where meritorious recipients were described to be "hardworking and productive" (Baumard et al., 2012; Rizzo, Elenbaas, Cooley, and Killen, 2016). These two variables are confounded, to some extent, because individuals could work hard and not produce much, or not work hard and produce a lot. It is important to disentangle effort and outcome in this context because if these two are conflated, then individuals might mistakenly assume high effort based solely on an observation of the outcome; or conversely, individuals may mistakenly assume low effort based solely on an observation of low outcome. This is problematic because "working hard" involves positive

intrinsic aspect of an act whereas “being productive” reflects a result of efficiency or accomplishing a job, which could happen as a result of luck or other external factors. Thus, effort and outcome are two distinctive factors which need to be investigated respectively, and this documentation would help us better understand how children come to reach a moral decision that ensures fairness for everyone.

To fill in this knowledge gap, this study investigated children’s understanding of merit in resource allocation context when: 1) effort and outcome were confounded (i.e., one worked hard and produced more vs. one did not work hard and produced less); 2) outcome was controlled (i.e., one worked hard vs. one did not work hard, while outcomes were the same); 3) effort was controlled (i.e., one produced more vs. one produced less, while efforts were the same); and 4) there was a tension between effort and outcome (i.e., one worked hard but produced less vs. one did not work hard but produced more). From in-depth investigation of these contexts, this study aimed to shed light on what lied beneath children’s full understanding of merit and how children’s conceptions of morality in distributive justice changed with age.

Parameters of Interest

Effort. When children are asked to distribute a limited number of resources, with age children increasingly allocate more resources to a hardworking person who also produced more (Kangniesser & Warneken, 2012; Liénard, Chevallier, Mascaro, Kiura, & Baumard, 2013; Melis, Altrichter, and Tomasello, 2013; Rizzo, Elenbaas, Cooley, and Killen, 2016). This indicates that children’s conceptions of fairness regarding merit – when effort and outcome are confounded in merit – develop with age. However, while this can mean that children consider effort as an important criterion for fairness decisions, it is not certain whether the findings are driven by effort, and not from outcome. In fact, a great deal of research also have demonstrated that it was not until middle to late childhood that children

put a strong emphasis on intentions rather than consequences (Helwig, Zelazo, and Wilson, 2001). In particular, a study by Kienbaum and Wilkening (2009) revealed that in morally complex situations where recipients' effort and need statuses were varied, younger children ages 6 years focused more on the need status rather than one's effort when making allocation decisions, while older children considered both effort and need as important allocation principles. Such findings raise the question of whether children display different judgment regarding meritorious recipients when the effort is the sole concern for children's allocation decisions. Thus, children's resource allocation when effort is the only factor that varies between the recipients, by controlling for the outcomes of the two recipients (i.e., productivity) should be investigated further.

Outcome. Children also take *outcome* (e.g., productivity) into consideration in their resource allocation decisions (Rizzo, Elenbaas, Cooley, and Killen, 2016; Schmidt, Svetlova, Johe, and Tomasello, 2016). Because prior studies have only examined situations where productivity is the result of effort, they also do not address the question of whether children's consideration of outcome itself – when disentangled from effort – is still prevalent. A long history of research in developmental science dating back to Piaget (1932) has demonstrated that children first focus on the consequences of a given situation and then gradually take other factors (such as intentions) into consideration as their moral thinking matures. For instance, when negative consequences occur due to unintentional moral transgressions, it has been found that children under 6 years of age were more likely to judge it as unacceptable compared to older children. This is due to the fact that older children are better able to incorporate intentions into their judgments of a behavior and its consequences (Imamoglu, 1975; Zelazo, Helwig, & Lau, 1996; Piaget, 1932). This raises the question of whether children regard outcome, controlled for effort, as an important allocation principle and how this differs with age.

Disentangling Effort and Outcome. Not only controlling for effort and outcome in merit is important in understanding children's fairness decisions, but it is also critical to examine situations where there is a tension between effort and outcome. That is, what if one person works hard but does not produce a lot, whereas another person produces a lot although he or she was lazy? It is an important question of which aspect – intention or consequence – of the work children would give more credit to and incorporate it into their fairness decisions. In order to examine this, two individuals where one has a high level of effort (and a low level of outcome) and another has a high level of outcome (and a low level of effort) should be compared as potential recipients. This area of research is warranted given that prior studies confounding effort and outcome did not reflect the real world; our everyday lives provide many instances of contrast between effort and outcome, with hard work garnering little, and scarce effort being richly rewarded. Examples of individuals succeeding with minimal effort and blind luck, while others work long hours and receive little to no recognition, are commonplace in society and tend to illicit strong reactions in adults. Therefore, an examination of children's judgments of resource allocation when there is a tension between effort and outcome is a meaningful extension of the previous literature concerning children's fairness conceptions. This will allow us to examine whether children prefer one factor over the other in their fairness decisions when effort and outcome were both salient, and further how this pattern develops with age.

Children's view on authority figures' allocation decisions. In addition to documenting children's own resource allocation decisions, examining children's evaluations of others' – especially authority figures – allocation decisions is another way to capture children's conceptions of fairness. Surprisingly, no studies have systematically investigated children's expectation on authorities' use of moral principles. What if an authority holds a view that is against children's own, such as giving resources to someone that they think does

not deserve? Will children respect the decision or have a say against it? Thus, there is a need to document children's evaluations and reasoning when a teacher makes *allocation decision on equality* (e.g., giving everyone the same amount, by disregarding merit) or *allocation decisions against merit* (e.g., giving more to the less hardworking peer and/or unproductive peer). This would allow us to examine how and whether children's resource distribution will be reconciled when children face authority figure's allocation decisions that does not reflect merit. If children had a solid understanding of merit, they would reject an allocation decision which does not reflect fairness distribution even if it came from an authority figure.

Theoretical Overview: Social Domain Theory

The study was informed by the Social Domain Theory (SDT) (Turiel, 1983; 1998), which enabled us to examine children's moral judgments and reasoning on merit-based resource allocation when effort and outcome were varied. The Social Domain Theory (Nucci, 1981; Turiel, 1983) posits three central domains of social knowledge: moral domain, societal domain, and psychological domain. The moral domain includes issues pertaining to justice, fairness, and rights; the societal domain includes issues pertaining to conventional rules and norms; and the psychological domain includes issues pertaining to personal choices and preferences. The SDT assumes that it is possible even for young children to reason about fairness, justice, and rights in the moral domain and thus, judge a transgression to be right or wrong. It has been found that children as young as 3 years of age distinguish moral and conventional events, and thus have the ability to apply moral criteria to moral events (Smetana, 2006; Smetana, Rote et al., 2012). Although extensive research has investigated prototypic moral transgressions (e.g., hitting and stealing) from the SDT perspective (Turiel, 2008), very few studies have used this theoretical framework to examine concerns for fairness. To fill in this gap, the current study aimed to use the SDT to examine children's decisions on dividing a limited number of resources in a fair way.

The Social Domain theory also puts a strong emphasis on the documentation of children's responses in different dimensions, including children's judgments, behaviors, and reasoning (Killen & Rutland, 2011; Turiel, 2008). SDT shows that different dimensions of children's responses altogether highlight children's developing moral concerns. Thus, in the current study, children were assessed in their own resource allocation decisions, evaluation of others' allocation decisions, along with the reasoning which includes children's underlying motivations that guide their judgments.

In addition, the Social Domain theoretical framework highlights the importance of the authority-independent features of moral judgments. A plethora of empirical studies have revealed that young children have the ability to make moral decisions on their own, apart from the influence of authority figures (Damon, 1977; McGillicuddy-De Lisi, Daly, & Neal, 2006; Sigelman & Waitzman, 1991). For instance, children as young as 3 years of age viewed moral transgressions such as hitting and teasing to be harmful and unacceptable, even when there were no rules or authority commands that prohibit the act (Smetana, Schlagman, & Adams, 2003). Further, children even believe that it was unacceptable for authority figures to find moral transgressions permissible and raising concerns regarding fair treatment and welfare of others (Wainryb, Shaw, Langley, Cottan, & Lewis, 2004). Although the authority-independent features have been extensively demonstrated in prototypic transgressional situations, such as physical harm (e.g., children still believe it is wrong to hit others even when authority approve the act of hitting others) (Laupa, & Tse, 2005; Laupa, Turiel, & Cowan, 1995), almost no studies have looked into this in the context of resource allocation decisions. Thus, this study examined the authority-independent feature in resource allocation context, extending the studies using Social Domain framework.

Overview of the Current Study

Children's full understanding of merit in their distributive decisions is directly related to the issues of one's welfare and rights. The general goal of the current study was to examine how children evaluated two factors of merit - effort and outcome - in their fairness decisions and how it changed with age. Thereby, the focus of this study was on how children internally negotiated and reasoned about whether an intentional aspect of the work deserved more or a consequential aspect of the work deserved more in a resource allocation setting. That is, when children reason about what makes an individual deserving of something, did they focus on the intrinsic motivation of the work or the consequences of the work?

To answer these questions, children were asked to make judgments in several situations which led them to weigh effort and outcome. These situations were: a) *children's own resource allocation* (in which children distributed resources in a way they think is fair when potential recipients differed in terms of effort and outcome); b) *children's peer preference* (in which children chose a peer that they would like to work with for a future task, when the peers differed in terms of effort and outcome); and c) *children's evaluations of teachers' allocation* (in which children evaluated an authority figure's allocation decisions which did not take merit into account or which sided only with either effort over outcome).

In this study, resource allocation framework was used; that is, children were given tangible resources (e.g., star stickers) to give out to potential recipients. The resources were designed to be desirable items for children. However, it is noteworthy that resources used in this study were different from rewards. Unlike rewards which are used to encourage or motivate someone's act, the goal of the resource here was not to incentivize a well-done act. The resources were used in this study only to provide children with an opportunity to think about what values they should integrate in order to reach a fair distribution decision. Thus, inviting children to allocate resources to potential recipients was one of the many ways to measure children's conceptions of fairness. In particular, the fundamental question that this

study aimed to answer is how children conceptualize merit (i.e., who deserves more resources) when making fairness decisions.

In terms of participants' age, two age groups of 3 to 6-year-olds and 7 to 10-year-olds were compared in order to capture developmental differences in their evaluation of merit in their fairness decisions. These two groups were selected based on the previous research: prior studies on children's emerging understanding of merit showed that 3 to 6-year-olds had somewhat limited ability to fully consider merit in their fairness decisions, while children above 7 years of age had concrete conceptions of merit (Melis, Altrichter, & Tomasello, 2013; Sigelman and Waitzman, 1991; Smith & Warneken, 2016).

Specific Aims

In everyday life, children's concepts of fairness and justice develop as they start to coordinate multiple factors into their allocation judgments (Cooley & Killen, 2015; Killen, Mulvey, & Hitti, 2013; Li, Spitzer, & Olson, 2014). It has been shown that children specifically acknowledge who works hard and who contributes more to a given task, and use such knowledge to decide who *deserves* more in their allocation judgments (Rizzo, Elenbaas, Cooley, & Killen, 2016). However, what remains unknown is how children evaluate effort when controlled for outcome and outcome when controlled for effort, and further how they take fairness into consideration when there is a tension between effort and outcome.

Aim 1: How children integrate effort and outcome in their allocation decisions.

The first aim of this study was to determine how children evaluate "effort" and "outcome" – the two components of merit - in their allocation decisions. It has been shown that when effort and outcome are confounded in merit, children increasingly incorporate merit in their fairness allocation decisions (Liénard, Chevallier, Mascaro, Kiura, & Baumard, 2013; Melis, Altrichter, and Tomasello, 2013; Sigelman and Waitzman, 1991). However, what still needs to be investigated is whether children integrate merit to their fairness decisions when

outcome is controlled, and when effort is controlled. Further, when children are given the opportunity to prioritize effort or outcome, little is known which factor children would regard as more deserving of resources.

Aim 2: How children use information on effort and outcome to make peer preference choices. The next aim of this study was to examine how children evaluate effort and outcome when they make peer preference judgments. That is, it is not known how children use information on effort and outcome when they decide whom they would like to collaborate with on a hypothetical group work. This context also needs to be investigated by fully disentangling effort and outcome; thus, children's peer preference would be examined when effort and outcome are confounded, when outcome is controlled, and when effort is controlled. In addition, when one peer displays effort while the other peer displays high outcome, children's preference for either effort-peer or outcome-peer needs to be examined to document which factor children value more in making peer selection for collaboration work.

Aim 3: How children evaluate authority figures' allocations. The third aim of this study was to examine whether children's conceptions of fairness regarding merit are independent from authority figures' input. Although prior work have shown that children tend to reject authority's moral judgments that contrast to their own moral values (Laupa, 1996), these studies were limited to physical or psychological harm, thereby leaving room for investigation on children's distributive justice. Thus, this study tested whether children would reject or abide by teachers' allocation decisions that were based on strict equality (i.e., giving equal resources to two individuals, disregarding different levels of merit) or teachers' allocation decisions that were based against merit (i.e., giving resources in direct contrast to merit). This would enable us to examine whether children accept authorities' opinions due to their high age status, or whether children advocate meritorious allocation regardless.

Further, this study examined how children would respond to authority's allocation decision advocating either effort or outcome when there was a tension between these two factors. That is, children how would evaluate authority figures' allocation decisions based on effort over outcome (i.e., giving more resources to a hardworking individual over a productive individual) and outcome over effort (i.e., giving more resources to a productive individual over a hardworking individual) would be examined.

Hypotheses

The current section provides specific hypotheses that correspond with the aims of the current study described above.

Children's understanding of merit: when effort and outcome are confounded (baseline). Will children regard merit as an important factor to deviate from equality when effort and outcome are confounded in merit? In order to examine this question, children were first given the opportunity to distribute a limited number of resources to two peers: one peer with high effort and high outcome (meritorious peer) and another peer with low effort and low outcome (non-meritorious peer). It was predicted that children would allocate more resources to a meritorious peer, thereby considering *greater effort and outcome* as an important factor to deviate from equality, as found in previous studies on children's understanding of merit (Rizzo, Elenbaas, Cooley, & Killen, 2016; Sigelman and Waitzman, 1991). As children's moral thinking develops, it was expected that older children would make meritorious allocation decisions and also refer to the importance of effort in their justifications, more so than younger children. Similarly, when children were asked to choose a peer to collaborate with for a hypothetical future task, children were expected to choose to work with the meritorious peer who displayed greater effort and outcome (over the peer who displayed less effort and outcome) and this tendency was expected to increase with age. Lastly, when children were faced with an authority's non-meritorious decision, it was

predicted that with age, children would increasingly reject authority figures' allocations that did not consider merit into account (e.g., allocations based on strict equality and allocations against merit). This was expected based on prior research that as children reject adults' immoral judgments and regard them to be unfair and unacceptable (Laupa et al., 2005).

Children's understanding of merit: controlling for outcome. The next question is, how would children evaluate merit *when outcome is controlled?* That is, will children regard merit as an important factor to deviate from equality *when only effort explains merit?* In order to examine this question, children were given the opportunity to distribute a limited number of resources to two peers: one peer with high effort (meritorious peer) and another peer with low effort (non-meritorious peer), while both peers had the same low outcome. It was hypothesized that children would allocate more resources to a meritorious peer who was hardworking than to a non-meritorious peer who was lazy, when both grew small number of flowers. As children in middle childhood view effort as a more important basis of deservingness compared to younger children (Kienbaum and Wilkening, 2009; Sigelman and Waitzman, 1991), it was expected that, when outcome is controlled, with age children would increasingly make meritorious allocation decisions based on effort; focus on the importance of effort in their justifications; prefer to work with the peer who displayed greater effort (over the peer who displayed less effort); and reject an authority's non-meritorious allocation decision.

Children's understanding of merit: controlling for effort. Similarly, would children regard merit as an important factor to deviate from equality *when effort is controlled?* That is, will children regard merit as an important factor to deviate from equality *when only outcome explains merit?* In order to examine this question, children were given the opportunity to distribute a limited number of resources to two peers: one peer with high outcome (meritorious peer) and another peer with low outcome (non-meritorious peer), while

both peers had the same low effort. It was hypothesized that children would allocate more resources to a meritorious peer with *greater outcome* (i.e., productive) than to a peer with less outcome, when both peers were lazy. Based on prior research showed that younger children make judgments based on consequences more so than older children due to their limited ability to understand the intentions of an act (Feinfield, Lee, Flavell, Green, & Flavell, 1999; Helwig, et al., 2001; Powell, Derbyshire, & Guttentag., 2012), it was expected that with age children would be *less* likely to make meritorious allocation decisions based on outcome and *less* likely to prefer to work with the peer who displayed greater outcome (over the peer who displayed less outcome). In children's justifications, it was predicted that older children would focus more on effort, while younger children would focus more on outcome. In addition, it was expected that older children would be less likely to reject an authority's non-meritorious allocation decision (i.e., giving more to the peer with less outcome, when the effort was same for both peers). These set of hypotheses were driven from the previous theories and literature suggesting that young children's such a strong emphasis on consequences (Helwig et al., 2001; Piaget, 1932).

Children's understanding of merit: giving priority to effort or to outcome. When there was a *tension between effort and outcome* (i.e., one peer with greater effort and less outcome vs. another peer with less effort and greater outcome), which factor – effort or outcome – would children prioritize more in their fairness decisions? Overall, it was expected that while older children would prioritize effort over outcome and thus allocate more resources to the peer who displayed greater effort (and less outcome) than to the peer who displayed greater outcome (and less effort), younger children would show the opposite pattern, thereby allocating more resources to the peer who displayed greater outcome (and less effort) than to the peer who displayed greater effort (and less outcome). This was based on the prior work that children under 7 years of age have been shown to judge intention based

on outcome, thereby prioritizing outcome over intention in their judgments (Feinfield, Lee, Flavell, Green, & Flavell, 1999; Montgomery & Montgomery, 1999; Schult, 2002; Shultz & Wells, 1985). Because children gain the increasing ability to incorporate intentions in their moral judgments as their moral thinking becomes more sophisticated (Noh, Jambon, Smetana, Lee, and Killen, 2017; Sigelman and Waitzman, 1991), it was expected that older children would be more likely to make meritorious allocation decisions prioritizing effort over outcome; focus on the importance of effort over outcome in their justifications; and prefer to work with the peer who displayed greater effort (over the peer who displayed greater outcome). In addition, when children were faced with an authority's decision that sided with effort over outcome, it was hypothesized that older children would be more likely to find it as acceptable compared to younger children. On the other hand, when faced with an authority figure's allocation decision prioritizing outcome over effort, the opposite age pattern was predicted.

Study Impact and Contributions

Overall, findings from the current study provided valuable foundational knowledge regarding how children conceptualize the moral principles of fairness based on merit. This study particularly defined the different components of merit and aimed to examine how effort and outcome respectively influenced children's fairness decisions, and further identify which factor – effort or outcome – was prioritized in children's moral judgments. Documenting children's developing trajectory in understanding merit would provide important information to the work of researchers, policy makers, and educators in the area of moral development.

CHAPTER 2

Literature Review

From everyday interactions, children reflect, abstract, and evaluate social exchanges and events that contribute to their general understanding of how individuals ought to act towards others (Smetana, Jambon, & Ball, 2014). These obligatory expectations about inter-individual treatment make up an essential component of morality. Understanding its origins and development contribute to the goal of investigating and documenting moral development (Damon, 1977; Piaget, 1932; Turiel, 1983, 1998).

Research on moral development has revealed that children care about others' welfare from an early age (Jambon & Smetana, 2014; Killen & Rutland, 2011; Vaish, Carpenter, & Tomasello, 2009). Over the past decade, a plethora of research has emphasized children's developing moral concerns regarding physical harm (e.g., hitting) and psychological harm (e.g., calling names) (Killen & Smetana, 2015; Smetana, Jambon, & Ball, 2014; Turiel, 1983). These lines of work have documented that children as young as 3 years of age judge that it is wrong to inflict harm to others because of negative consequences it brings to others (Smetana, Rote, Jambon, Tasopoulos-Chan, Villalobos, & Comer, 2012).

In understanding children's moral concern for others' welfare, a central moral issue is the *fair distribution of resources*. A resource allocation research framework has been widely applied to investigate moral decisions pertaining to distributive justice, an essential component of children's moral development (Kienbaum & Wilkening, 2009; Melis, Altrichter, & Tomasello, 2012; Rizzo, Elenbaas, Cooley, & Killen, 2016; Schmidt, Svetlova, Johe, & Tomasello, 2016; Sigelman & Waitzman, 1991). That is, the way resources are allocated to individuals is relevant to the issue of inflicting harm on others since unfair resource allocation is a form of unfair treatment. Children start to recognize the wrongfulness of the denial of resources to others from a young age (Rizzo & Killen, 2016; Smetana, Jambon, & Ball, 2014; Turiel, 1983). Given that unfair allocation of resources becomes the most frequent source of conflict in early childhood, investigations about resource allocation

are fundamental. Thus, children's judgments about distributive justice — decisions on how to fairly allocate resources among individuals — and its relationship to how children's moral concerns for others develop with age should be fully examined.

Several moral bases for ensuring the fair treatment of others have been investigated thus far (Killen, Elenbaas, & Rutland, 2016). Some of the examples are *equality* (dividing up resources equally; “3 candies for X and 3 candies for Y”), *need* (dividing up resources to those who needs more; “she is poor and has few resources; he is wealthy and has lots of resources.”), and *merit* (dividing up resources by taking into account deservingness; “he worked hard, and she was lazy.”). Such bases of fairness stem from moral philosophy and have been adapted by developmental psychologists to study the reasons children use to make allocation decisions.

Among these factors, recently merit has received much attention in studying resource allocation. However, the category of merit is complex and can include diverse aspects of deservingness. The term “*Merit*” reflects allocating resources according to deservingness, primarily based on how much an individual contributed to the task, such as effort (Carson & Banuazizi, 2008; Kienbaum & Wilkening, 2009). For example, when children are asked to give out a limited number of resources (e.g., stickers and cookies) to recipients, they prioritize those who have worked harder to earn good outcome, and judge that allocating more resources to the meritorious recipient is fair and just (Baumard, Mascaro, & Chevallier, 2012; Schmidt, Svetlovab, Joheb, & Tomasello, 2016). However, often times merit can include other factors than effort, such as production. For example, children may think it is fair to give more to the recipient who have a greater outcome although less effort was put into, focusing more on the product than effort in measuring deservingness. Thus, one main goal of the current review will be to examine how “merit” has been conceptualized by children, and how it has been measured in resource allocation studies with young children. A full

investigation on children's understanding of merit will provide a sound basis for future studies in this area of research.

In addition to children's *own* fairness decisions based on merit, this literature review will examine children's views about *authority's* fair distributions. Although extensive research has investigated children's conceptions of authority and authority jurisdiction in moral contexts (Laupa, 1995; Laupa, & Tse, 2005), little research has examined this factor in resource allocation context. For instance, how do children conceptualize what principles authorities (e.g., parents, teachers, community leaders) rely on when allocating resources? In instances where authorities do not make fair distribution decisions, will children challenge against authority or agree with them? To examine children's full understanding of merit, it is important to document how and whether children reconcile their fairness judgments when they face authority's unfair (e.g., non-meritorious) allocation decisions. Although very few studies have been conducted in these areas, these concerns will be examined in a resource allocation context in this literature review.

The goal of this literature review is to examine research on children's moral judgments regarding the fair allocation of resources with a particular focus on merit, and on children's views about the use of moral principles by authority figures. Thus, this review will be organized in four sections: 1) exploring the theoretical background of children's conceptions of fairness; 2) reviewing empirical studies on children's developing moral principles of fairness in the resource allocation context, with a focus on merit; 3) examining children's views about authority fairness distributions in resource allocation contexts, and 4) offering further directions for the current study.

Theoretical Background of Children's Developing Concerns for Fairness

Piaget's Theory of Moral Development in Childhood

Piaget's (1932) foundational research set the stage for an entire field of research on

the origins of morality in childhood. In his book *The Moral Judgment of the Child* (1932/1965), Piaget reported on a vast number of empirical studies involving observations of and interviews with children designed to determine how they developed an understanding of moral judgment. He collected responses to vignettes covering a diverse range of moral dilemmas, including division of resources, fairness in punishment, and intentional and unintentional transgressions. Upon examining the reasoning underlying children's decisions and investigating how children from diverse age groups reason differently about fairness, Piaget postulated that children experience two phases in understanding distributive justice, largely framed as heteronomous and autonomous period.

Piaget stated that children before 7 to 8 years of age are in the heteronomous period, when they view fairness as resulting from authority mandates rather than from children's construction of moral principles and rules. Rather than thinking about what is the just way to distribute resources themselves, children in this period tend to follow moral rules given by the authorities. Nevertheless, if the adults fail to consistently carry out the rules they set for children, children consider treatment as unfair and unjust. However, if adults reliably stick to a certain set of rules, it is this set of rule that is understood to be just and fair by children in this age.

By the time children reach 11 to 12 years of age, Piaget speculated that children become more autonomous, wherein the conceptions of fairness stem from their own concept of distributive justice. Children in this period no longer abide authority's precedence over justice and understand that authority cannot be the source of justice. Piaget asserted that adults are still influential in children's development of fairness conceptions, but that authority itself is not a sufficient source of justice. Further, children at this age claimed to develop equalitarianism in the direction of relativity. That is, children take into account a variety of

factors, such as individual circumstances and situations (e.g., “He is bigger so he may need more cookies than the smaller person”).

In addition to differentiating the heteronomous and autonomous periods, Piaget also theorized *how* the development of moral concepts developed from a less advanced to a more advanced phase. In other words, Piaget emphasized that children’s social interactions with other people, especially their peer interactions (e.g., sharing resources like toys) are what drive children to move to a more advanced understanding of fairness and distributive justice, more so than one-way instruction from an adult. He further asserted that children are not passive recipients of moral knowledge, but rather take an active role in constructing moral principles of justice.

Damon’s Approach to Children’s Moral Judgments and Reasoning

Following Piaget’s (1932) classic work, Damon (1977) proposed developmental changes regarding children’s distributive reasoning. Similar to Piaget (1932) and Kohlberg (1969), Damon conducted extensive interviews with children 4–10 years of age. Specifically, he posed dilemmas in which limited resources had to be allocated among several people who differed in terms of factors such as need and merit, and found that children progress through 6 developmental levels. The primitive level is 0-A, in which children make distributive decisions based on self-interest: “I should have more because I want it more.” Children at this level assert choices rather than trying to justify them. Children in the next level, 0-B, are similar in that they use self-interest as the decision benchmark; however, they justify their decisions based on external factors, including physical characteristics such as sex and race: “We should get more because we are boys”. Children at both of these levels fail to consider what is fair and right for others.

In the next level, 1-A, at about the age of 5, children start to develop a notion of strict equality, believing that the only fair way to treat everyone is to divide resources equally. The

next level emerges at age 6 or 7 (Level 1-B), with children now developing a better understanding of merit, in that they link fairness to how much someone deserves something. Children in this level believe that one should receive resources to the degree that one worked hard or did something good.

A better understanding of distributive justice forms at the next level (2-A) in which children of around 7 or 8 learn that different individuals can have different and competing, yet equally valid, justifications for their claims. However, consideration of “one’s needs” in distributing fairly becomes more salient for children in this level. They often confuse fairness with compromise and believe that poor people should receive more to compensate, thus entering a benevolent mode of behavior. In the final level (2-B), children fully consider all justice claims, such as need, equality, and merit, and try to coordinate these factors for a given situation. Thus, for example, children may believe that it is fairest to give more to a harder working person because doing so promotes an atmosphere that encourages everyone to work harder, even while they believe that equal distribution is the fairest allocation for a collaborative task.

Piaget and Damon similarly proposed age-related developmental sequences in children’s conceptions of fairness. Both assumed that younger children are more focused on the authority commands or self-interest, while older children base their justifications on more cognitively complex principles of justice, such as merit.

Social Domain Approach

Social domain theorists proposed an alternative model aimed to understand how children’s understanding of the moral domain develops from an early age (Killen & Smetana, 2015; Smetana et al., 2014; Turiel, 1983). Differing from Piaget’s argument that younger children have a limited ability to establish moral concepts on their own and therefore develop a general deference to authority, Turiel (1983) and colleagues contended that young children

conceptually construct different types of social knowledge (moral, societal, personal) from the initial stages of their development. They found that children as young as 3 to 4 years of age were able to distinguish moral events which pertain to others' welfare (e.g., one should not steal others' toys) from various kinds of social knowledge, such as social conventions (e.g., wearing school uniforms to school) and personal decisions (e.g., whom to invite for one's birthday party). This perspective claims that children have the ability to harbor a moral concern for fairness, justice, and others' welfare from an early age and, further, to understand that moral rules are absolute and unalterable (Turiel, 1983, 1998; Killen & Smetana, 2015). Furthermore, research based on this theory provided new findings regarding children's thinking about distributive justice. Because children's conceptions of fairness emerge from their own speculation of what is just from an early age, children base their fairness decisions on what they think is fair treatment of others, rather than abiding by norms, rules, or authority.

The social domain perspective also emphasizes the importance of documenting children's reasoning for their judgments. This methodology provides a more detailed description of how children's distributive justice undergoes a developmental trajectory. Although children's judgments may seem similar (e.g., both children think that it is fair to allocate more school supplies to someone who is poor than someone who is rich), children's underlying reasons appear to be different (Nucci & Turiel, 2009; Turiel, 2006). For example, children who focus more on conventional social knowledge may highlight the norms of the society (e.g., it is the group's tradition that we give more to the needy children), whereas others focus on fairness and justice (e.g., the poor children need the school supplies to have the same resources and opportunities to learn as others). Thus, in examining concepts of fairness, it is a priority to investigate the reasoning behind children's decisions in a resource allocation context. Considering this social domain perspective, more studies are needed to

investigate when and how children's considerations about moral issues take priority over considerations of other social knowledge, like societal and personal issues. How this concern develops with age is also an important aspect to be investigated further.

In the following sections, theories discussed here - such as the social domain theory and Piaget's theory - will be referenced in order to explain and interpret current empirical research findings, as well as to provide new directions for future study.

Development of Children's Fairness Allocation Decisions

Early Understanding of Fairness: Children's Preference for Equality

The origin and development of children's early understanding in fair resource distribution has been extensively examined from multiple theoretical perspectives. Overall, it has been emphasized that younger children are more likely than older children to regard equal distribution to be the fairest arrangement; however, over time, children's preference for strict equality is tempered by a more complete consideration of equity and merit when distributing resources (Piaget, 1932; Damon, 1977; Rizzo & Killen, 2016). Thus, with age, children increasingly incorporate factors such as whether an individual needs resources more, or whether a person has worked harder to acquire resources in their resource allocation decisions.

From a traditional developmental science perspective, Piaget (1932) and Damon (1977) argued that children prefer equality among recipients when distributing resources. That is, approximately up to around 5 years of age, children are found to abide by strict equality and judge such equal distributions to be fair. Interestingly, this is found to be evident even in situations where children's self-interests are factored in, such as when they have opportunity to keep more for themselves.

Extensive research work on the early roots of fairness understanding also illuminated children's preference for equality (Olson & Spelke, 2008; Geraci & Surian, 2011; Schmidt &

Sommerville, 2011). This line of work documented how early children start to prioritize equal distribution over unequal distribution by examining participants as young as infancy and toddlers. For instance, toddlers' looking times and preferences for puppets were examined in situations of equal or unequal distributions. Schmidt and Sommerville (2011) showed children two puppets who were given either equal or unequal resources and found that 15 months of age toddlers looked at the unequal allocations for a significantly longer time than the equal allocations, suggesting that they regarded such unequal distributions as unexpected or surprising. Further, Geraci and Surian (2011) showed that 16 months of age toddlers preferred a puppet who allocated the same amount of resources to recipients, thus demonstrating equal distribution, over ones who did not. These studies suggested that fairness understanding exists even in early childhood.

In addition, researchers who focused on children's social categorization and their fairness decisions provided some additional evidence for preschool children's preference for equal distribution (Olson & Spelke, 2008). In a study by Olson et al. (2008), children were introduced to puppets that differed in terms of relationship status, such as strangers, family members, and friends. Although 3.5-year-old children were more likely to give resources to those with close relationships (family, friends) than strangers, this was only salient when the resources were limited. When resources were plentiful, children preferred to give them out equally to family members and strangers, making further implications for children's preference for equal sharing.

Converging evidence was also provided by researchers from both the comparative psychology perspective (Warneken, Lohse, Melis, & Tomasello, 2011) and the behavioral economics perspective (Fehr, Bernhard, & Rockenbach, 2008; Hook & Cook, 1979). For example, Warneken et al. (2011) showed that children as young as 3 years of age preferred to share a limited number of resources with their peers even when their self-interest could drive

their judgment (e.g., the situation allowed them to take all the resources for themselves). Further, when children were faced with an unequal resource distribution between themselves and others, they were willing to remove an extra resource (e.g., throw the resource to a trash can so that equal distribution can be met) (Blake & Rand, 2010). Other studies also revealed that when more resources were given to benefit the self, children rejected the given unequal distribution (Blake & McAuliffe, 2011).

More recently, developmental perspectives based on the social domain group theory emphasized, by documenting children's allocation judgment and reasoning, that young children's preference for equality is also salient when external factors (e.g., need) vary. In a study by Rizzo and Killen (2016), children viewed a limited number of resources and were asked to allocate these between two recipients, one wealthy and the other poor. Although the recipients' need differed (i.e., the wealthy recipient had less need for the resources), children around 3 to 4 years of age preferred to distribute resources equally to both recipients, not reflecting the different levels of needs. In their reasoning, young children referenced the *equal* treatment of individuals (e.g., "They should get the same amount") more than they referenced others' welfare or needs (e.g., "They'll get very sick if they don't have any."). This reflected that for children 3 to 4 years of age, the criteria for fairness judgments are determined based on whether people receive *equal* treatment, regardless of other factors such as need or merit.

Concerns for Merit in Fair Resource Allocation

As discussed above, diverse theoretical perspectives suggest that preference for equality is strong from an early age (Damon 1977; Olson & Spelke, 2008; Warneken, Lohse, Melis, & Tomasello, 2011). However, ample research has shown that children's conceptions of fairness develop from strict equality to more mature resource allocation modalities, such as taking one's merit into account as their moral thinking develops (Sigelman & Waitzman,

1991). In other words, children come to incorporate how hard one worked, and how much one produced in their resource allocation decisions and learn that unequal distributions are justified in certain situations when merit is salient (Kienbaum & Wilkening, 2009; Rizzo et al., 2016; Schmidt et al., 2016). Merit is often presented as the overall contribution required to gain resources. In this sense, merit involves both level of *effort* (how hard you work) and level of *outcome* (how much you produce). The following section discusses children's developing understanding of merit in resource allocation distribution with age, children's incorporation of merit into allocation decisions when other factors (e.g., need) are present, and how their merit-based distribution changes in regards to type of resources (e.g., whether the resources are necessary or luxury in nature) to be allocated.

Merit-based distribution across ages. With children's emerging understanding of concerns on merit, children come to realize that strict equality is no longer the optimal distribution in every case. Thus, with age, children increasingly integrate how much an individual contributed in a given task into their resource allocation decisions. For young children under the age of 6 years, there are some competing arguments on when children come to integrate merit in their distributive judgments. While some prior studies reveal that it is not until 7 years of age that they fully incorporate merit in making fair allocation decisions (Baumard et al., 2012; Waitzman, 1991), other studies find that children as young as 3 years of age have the ability to recognize people who work harder, and thus judge that it is fair to give more resources to them (Kanngiesser & Warneken, 2012; Liénard, Chevallier, Mascaro, Kiura, & Baumard, 2013).

For example, one study by Melis, Altrichter, and Tomasello (2013) documented that young children's distribution of resources varied as recipient effort varied. Children as young as 3 were introduced to a hardworking puppet who worked collaboratively on a task and to another free-riding puppet who expressed a preference not to collaborate. When children

were asked to share a limited resource (e.g., gummy bears) between the puppets and themselves, they were more likely to share equally with the hard-working puppet than with the free-riding puppet. Thus, young children were able to not only acknowledge others' hard work, but to reflect this acknowledgment in their allocation decisions regarding limited resources.

However, different studies suggest that it is not until 6 or 7 years of age that children evaluate merit as a legitimate reason to deviate from equality (Damon, 1977; Sigelman & Waitzman, 1991). Baumard et al. (2012) provides some insight into the developmental trajectory of children's understanding of merit. In this study, children 3 to 4 years of age were told about two protagonists. One worked hard to bake the cookies and the other did not. To fully test children's understanding of merit, children were asked in different contexts: how they would give out one big cookie and a small cookie (forced choice unequal distribution); and how children would give out 3 cookies, without initially forcing them to give all three cookies to the two protagonists. An interesting finding was revealed: when children were faced with the first forced choice question, a majority of them gave a bigger cookie to the hardworking person, reflecting their understanding of merit. However, when the second question was not framed to be a non-forced choice question, a majority of children initially preferred to give out equally by not giving out the third cookie to anyone. The findings implied that children as young as 3 to 4 years of age still prefer equal treatment; however, it also shows evidence for the precursor to their gradual understanding of merit.

Similarly, children's understanding of fairness distribution based on merit was found to develop dramatically in the preschool period and thus full understanding of merit was apparent around 8 years of age (Schmidt, Svetlova, Johe, and Tomasello., 2016). This study by Schmidt et al. (2016) examined 3-, 5- and 8-year-olds to examine how children integrate merit into their resource allocation judgments. In this study, children were shown two

puppets: one neutral puppet that did not provide any reason on why she should receive more resources, and another puppet that claimed why she should get more resources based on *merit*. Merit was reflected effort, such as “[target puppet] cleaned up the room”. The findings revealed that 3-year-olds displayed a strong preference for equality between the neutral puppet and the puppet with a reason, although they were given justification for one puppet to receive more resources. However, such preference for strict equality diminished dramatically between 3 and 5 years of age, reflecting children’s increasing ability to consider why one puppet deserves more than another. Particularly between the ages of 5 to 8 years, children were more likely to give more to the meritorious puppet as they increasingly considered merit to be a justified reason to deviate from equality.

In addition, this study further examined whether children are able to differentiate reason based on merit from reasons based on egocentric demand (e.g., I just want more). Thus, children were asked to allocate resources between the neutral puppet and another puppet with egocentric demand. Up to 5 years of age, children indiscriminately favored the meritorious puppet and egocentric puppet over the neutral puppet, thereby giving more to the puppet who provided *any* reasoning. However, an interesting developmental change between 5 to 8 years of age showed that children’s acceptance of egocentric reasons did not increase, thereby not giving more to a puppet just because she wants more. This is unlike their increasing acceptance of legitimate reason based on merit. The findings suggested that children develop a more profound understanding of distributive justice as they age, allowing them to move from observing strict equality to deviating from equality for any given reason, and then finally to deviating from equality for legitimate reasons, such as merit.

Merit-based distribution in morally complex situations. Not only do children acknowledge merit in a straightforward context where one works hard and the other does not,

but children are also found to integrate merit in complex situations, such as when other factors (e.g., needs) are embedded in merit.

Kienbaum and Wilkening (2009) examined principles that children and adolescents of 6, 9, and 15 years of age rely on when distributing resources to others. All children were introduced to recipients who varied in terms of effort in cleaning a schoolyard and in terms of need for resources (i.e., candies). Then, the children were examined by which factors they relied upon more in their fair allocation judgments. For example, children heard that the first protagonist had collected a small (or medium, or big) amount of garbage, whereas the second protagonist hadn't collected any garbage, thereby differing the level of effort. However, the second protagonist was described to have more (or less, or as much) candies as compared to the first protagonist, in order to vary the comparative level of needs. Then, children were asked to distribute candies in a way that they think is the fairest way. As expected based on previous literature, even the youngest children (6 years) rarely relied on strict equality and were old enough to understand that certain principles legitimately justify deviations from equality. Interestingly, this study revealed the principles that children most valued at each developmental stage: the youngest children in primary school (6 years) mainly focused on recipient's *needs* and allocated resources mainly based on who had less at home, rather than considering who worked harder to clean up. However, children aged 9 years and 15 years showed evidence that they increasingly considered both *effort* and *need* as primary allocation principles, thereby integrating two factors into their allocation judgments. For example, adolescents were much more likely than younger children to judge that the high effort/low need person deserved more than low effort/low need, whereas younger children judged that the high need person deserved more than low need person, regardless of the level of effort. This age-related pattern revealed that children's judgments concerning fairness and justice

emerge from an earlier understanding of needs throughout preschool age, and then further start to integrate effort more as they enter middle to late childhood.

Similarly, Sigelman and Waitzman (1991) illuminated the developmental trajectories of children's use of merit by investigating from childhood through early adolescence - 5 to 13 years of age (divided into 5, 9, and 13 years of age) - when other additional factors such as needs and age status are varied. This study departed from previous studies in that it manipulated not only recipients' effort and need, but also the situational contexts (e.g., in which situations children made the decisions). Children were presented with three characters: one character who was more productive and thus made more paintings, pots, etc. than the others ("merit"), one character who was poor and needed more clothes, money, etc. than the others ("need"), and one character who was older than the others ("age"). Then, children were asked to allocate 9 resources (e.g., ballot, money) in two different situational contexts: 1) voting and 2) charity. For the voting scenario, recipients had the privilege to vote for their favorite game per ballot received and thus, they had more votes if they received more resources. For charity scenarios, recipients were given money, which they could spend to buy things they needed such as socks, and thus they had more money to use if they received more resources. The findings revealed that the youngest group of 5 years was more likely to distribute equally regardless of the different moral claims of merit and need, revealing that children at this age are still insensitive to principles of distributive justice. With age, however, older children of 9 and 13 years of age were able to incorporate both factors of merit and need into their judgments and further, tailored their decisions to the situational context. That is, older children allocated more resources to *meritorious recipients* in a "voting" context in which hard work was emphasized, whereas children preferred to allocate more resources to *the needy recipient* in the "charity" context in which need is emphasized. These findings add to the current literature in demonstrating that children not only integrate

diverse sets of legitimate principles in fairness decisions, but they also develop the ability to consider situational contexts in which they make judgments.

Merit-based distribution and type of resources. Most previous studies on children's reliance on merit in resource allocation have paid little attention to the *type* of resource. That is, most studies invite children to allocate simple toy-like resources, such as stickers and gummy bears. However, a recent study by Rizzo, Elenbaas, Cooley, and Killen (2016) did manipulate resource type, with resources either introduced as necessary (e.g., something needed to avoid harm, such as medicine) or as a luxury (e.g., something enjoyable to have, such as toys) with the aim of determining whether this difference would influence children's reliance on merit in allocation decisions. Two groups of children, ages 3 to 5 and age 6 to 8, were introduced to a situation in which *merit* was varied: one character applied greater effort (e.g., someone works really hard looking for resources and finds a lot of resources) and another character applied no effort (e.g., another person is lazy and does not work to find any resources). When children were asked to allocate resources between the two characters, an interesting age-related change emerged with regard to resource type. The older children allocated more of the luxury resource to the hardworking character than the younger children, showing a more mature understanding of merit in allocation decisions. On the other hand, older children were more likely to distribute the necessary resource more equally in comparison to the younger children. This reflected that although older children had a better ability to integrate effort into their allocation decisions they were, at the same time, also more likely to raise concerns for others' welfare by considering the nature of resources divided. That is, for necessary resources like food and medicine, older children judged that effort should receive less consideration because such resources are essential for welfare, whereas luxury resources were allocated primarily by merit. This study demonstrated that children consider effort in resource allocation, but their consideration of effort can vary depending on

resource type.

While extensive research have focused on children's understanding of merit in resource allocation context, the review of empirical studies showed that almost none of the previous studies have delineated how exactly children define merit in distributing resources. In other words, not much is shown how and whether children disentangle effort from production and how this is related to their fairness judgments in resource allocation. This brings a further question such as, do children view merit as based on how hard one works or how much one produces? Thus, more investigation is warranted to fully examine children's fairness principle concerning merit, which will be discussed more in the future directions section. In the next section, research on children's views about authority distributions based on diverse moral concerns will be reviewed.

Children's Views about the Moral Basis for Allocating Resources by Authority

Despite the extensive literature on children's conceptions of authority and authority jurisdiction in moral contexts (see Laupa, 1995; Laupa, & Tse, 2005; Laupa, Turiel, & Cowan, 1995), little research has been conducted on how children conceptualize what principles individuals in positions of authority (such as teachers and parents) rely on when allocating resources. This raises several questions: what moral principles do children expect individuals in positions of authority to focus on? Do they expect that authority members to rely on equality or equity like merit? When considering merit, do children view authority members as focusing on effort, production, or another merit-based dimension? Whether children's resource distribution would be reconciled when they face authority's unfair (e.g., non-meritorious) allocation decisions is an important area of investigation. Though still limited, growing bodies of work have investigated these concerns in a resource allocation context.

Children's Expectations of Authority' Fair Resource Distribution

Although a few, some studies have revealed that children expect authorities to integrate diverse moral concerns rather than abiding to strict equality when allocating a limited number of resources (Elenbaas & Killen, 2016; Elenbaas, Rizzo, Cooley, & Killen, 2016; Li, Rizzo, Burkholder, & Killen, 2016). For example, a study by Elenbaas, Rizzo, Cooley, and Killen (2016) asked children how an authority member (e.g., someone in charge of a city) should give out a limited number of school supplies to two different schools: a wealthy school (e.g., already has lots of supplies) and a less wealthy school (e.g., has a lack of supplies). In order to track the developmental change, two different age groups of 5 to 6 years and 10 to 11 years were examined. The findings revealed that children expected the authority to recognize the need for supplies in the disadvantaged school and distribute resources accordingly. That is, city authorities were expected to give more school supplies to the less wealthy school than to the wealthy school. In addition, children's acceptability judgment ("okay or not okay") of the authority's hypothetical resource allocation was documented. Thus, children were asked, "What if the person in charge of the city gave more boxes to this school because they always got less before? How okay or not okay would that be?" Here, 70% of children across all ages positively evaluated the authority's decision to give more supplies to a disadvantaged school. In their reasoning for the judgments, an age-related change was found: older children raised issues of *Past Inequality* (e.g., "They - the less wealthy school - didn't have more before") more than younger children.

Another study by Li et al. (2016) investigated children's acceptability judgment ("How okay or not okay?") about a teacher's allocation decision to determine how children evaluate decisions that reflect equality or inequality. In this study, children were presented with an authority figure in the form of a classroom teacher who had two juice boxes to allocate between two students. One student (A) did not have any juice box in his bag and the other student (B) already had two juice boxes in his bag, but was not aware of the fact; thus,

both students thought they did not have any juice boxes. Three conditions were presented to children: 1) teacher gives two juice boxes to A and no juice box to B (*unequal allocation* in the teacher's viewpoint which resulted in *positive equitable allocation*), 2) teacher gives no juice box to A and two juice boxes to B (*unequal allocation* in the teacher's viewpoint which resulted in *negative inequitable allocation*), and 3) teacher gives one juice box to A and one juice box to B (*equal allocation* in the teacher's viewpoint which resulted in *negative equitable allocation*). Findings revealed that children expected the authority to make decisions based on what they thought would be the fair resource allocation, thereby giving the same amount to both. That is, regardless of consequences, after integrating the perspective and given knowledge of the teacher, children evaluated equal allocation by the teacher (giving 1 to each student) to be more acceptable than other conditions when the teacher gave out unequally. This was prominent even when ways to distribute by the teacher resulted in rectifying hidden preexisting inequality. The findings revealed that in the resource allocation context, children not only consider multiple moral concerns like need and merit, but they also integrate the perspective of the allocator in their resource allocation judgments, reflecting their mature understanding of fairness principles.

Although several studies have highlighted what moral principles children expect individuals in positions of authority to focus on, these have been limited to situations where the levels of need were different (i.e., preexisting inequality). Few studies have explored resources distribution contexts when merit is integrated. Thus, future investigations on how children would expect the authorities to make fairness decisions are warranted, particularly when it relates to children's merit-based allocation decisions.

Children's Resource Distribution with regards to Authorities' Non-meritorious Distributive Decisions

Children's in-depth understanding of a moral principle can be examined by documenting how children's resource distribution would be reconciled when they face authority's unfair (e.g., non-meritorious) allocation decision. That is, how do children evaluate an authority figure's decision to allocate resources in a way that is potentially unfair? This examines what children would do when they face rules or authority claims that are not in line with their fairness principles. For example, authority figures could provide suggestions that result in an unfair distribution, such as giving more to a person who has applied less effort (e.g., lazy worker), or already has more (e.g., wealthy school).

Different perspectives suggest different views on this: traditional developmental theorists such as Piaget (1932) would suggest that young children before ages 7 to 8 years are likely to accept authority's unfair decision based on the child's early unilateral respect for authority. After that stage, children are found to make fairness decisions stemming from their own moral principles. By contrast, more recent studies have revealed that children as young as 4 years of age have the ability to make allocation decisions based on what they believe is fair, and reject authority commands that seem unfair and unjust, such as giving less to a harder-working recipient (Elenbaas & Killen, 2016; Elenbaas, Rizzo, Cooley, & Killen, 2016; Li, Rizzo, Burkholder, & Killen., 2016).

For example, a study by Elenbaas et al. (2016) found that children consider authority's unfair distribution to be unacceptable. After children were presented with two schools, a wealthy school (e.g., already has lots of supplies) and a less wealthy school (e.g., has a lack of supplies) and then viewed an authority allocate a new set of resources, an authority figure made a non-fair distribution such as "the person in charge of the city gave more boxes to this school because they always got more before". Here, a majority of children (77%) evaluated this to be not acceptable. In addition, an interesting age difference revealed that older children (10-11 years) evaluated this more negatively than younger children (5- 6

years), reflecting their developing concerns for rectifying preexisting inequality. Findings showed that children as young as 5 years old did not abide by authorities' decisions to perpetuate the unequal treatment just because the claim came from authority, but rather judged it to be wrong.

Similarly, another study by Fry and Corfield (1983) examined a situation where an authority made decisions regarding the distribution of resources fairly or unfairly to the child for their hard work. In this study, a mother gave her child a fair amount of money for cleaning his room, which reflected *fair allocation*. In the other condition, the child received an unexpectedly unfair amount of money, which reflected *unfair allocation*. Findings showed that children 10 -11 years of age thought that it was not acceptable for the mother to give the child an unfair compensation for the effort, which suggests that children's conceptions of fairness in resource distribution are independent from authority's decisions and commands. More studies on children's resource allocation decisions based on their own conceptions of fairness, and not merely on authority views, should be conducted to fill this gap in the literature.

In addition, similar sets of findings on children's rejection of wrongful commands have been extensively shown for general moral principles in a variety of moral contexts other than distributive justice, such as *physical transgressions* (e.g., "it is wrong to harm others") and *psychological transgressions* (e.g., "it is wrong to call mean names to others") (Killen & Smetana, 2015; Turiel, 1993, 1986; Laupa & Tse, 2005), and even more complex situations in which wrongful *stereotypic commands* are issued ("boys are not supposed to practice ballet") (Park et al., 2012). In applying these general moral principles, children did not blindly obey authorities' misleading commands even from an early age.

The current study

This literature review outlined different perspectives on theory and research on children's allocation decisions in regards to merit, along with children's views on authority's distributive decisions. Still, considerable work is needed to better understand how children incorporate "merit" in a resource allocation context.

Effort-based Resource Allocation: Disentangling Effort from Outcome

One line of research that would be fruitful to investigate is how children define merit and the extent to which they focus on effort (how hard one works) versus production (how much one produces). In general, meritorious protagonists are described in child development research as "hardworking and productive," especially in contexts examining children's distributive justice decisions. What is not known is the bigger concern of whether it is the *effort* itself or the *productivity of the hard work* that drives children's fairness decisions regarding resource allocation. It could be that children primarily value the intentional aspect of actors—how hard one works on a given task—regardless of the outcome. In that case, they would regard effort alone as the legitimate reason to deviate from equality. However, it could also be that children focus on the outcome—how productive the actor has been in a given task—regardless of their level of effort. Further, there would also be some instances when these two factors are in conflict, effort versus outcome; that is, when one is hardworking but not productive or one is lazy but productive. Little is known about which aspect or merit – effort or outcome - children would prioritize in their fairness decisions and how it varies with age.

This focus is relevant for Piaget's (1932) research on children's developmental trajectories for weighing intentions and outcomes. Piaget (1932) asserted that children first focus on the outcomes at an early age and then gradually come to consider intentions at a later age. For example, upon comparing children's evaluation on ill-intentioned transgressions (e.g., a boy was being naughty and broke one cup) versus accidental

transgressions (a boy unknowingly broke 10 cups), Piaget suggested some developmental trajectory that younger children are more driven by the consequences of actions, thereby judging accidental transgressions as more unacceptable. Piaget's argument was not exclusively theoretical: Some later studies (Costanzo, Coie, Grumet, & Farnill, 1973; Imamoglu, 1975; Zelazo, Helwig, & Lau, 1996) supported his claims in demonstrating that although children 5 to 8 years of age had the ability to take intention into account, their consideration of intentions was primarily based on the outcomes of actions. Additionally, an empirical study by Helwig, Zelazo, and Wilson (2001) also revealed some age related findings for 3, 5, and 7 years in children's judgments of psychological harm and their assignment of punishment when intentions and outcome were varied. When children were shown an actor having a positive or negative intention to give a friend an exotic animal as a gift, children's overall judgment concerning the acceptability of actions was primarily and exclusively based on the outcome, namely the friend's reaction. That is, 3 to 7 years judged the act as wrong when it resulted in a negative psychological reaction (e.g., fear, embarrassment), regardless of the actor's intentions. However, age differences emerged in punishment assignment decisions: younger children tended to focus on outcome, whereas older children tended to focus on intentions, implying that some developing shifts are underway.

In short, current empirical studies strongly suggest that children's strong reliance on outcome continue to decrease with age throughout childhood as they develop a more mature understanding of others' intentions. While many studies have investigated such children's integration of intentions and outcomes in their evaluations of moral events, typically physical harm or destruction of property, very few have done so regarding children's resource allocation decisions. Therefore, the current study aimed to disentangle effort and outcome and further examine how children incorporate effort (positive intent) and outcome (positive

consequences) in their decisions regarding fair resource distribution and how these fairness decisions develop with age.

Conclusions

This literature review has examined the origins and development of children's conceptions of fairness and their resource allocation decisions. In particular, the literature has emphasized children's developing understanding of merit in the resource allocation context (Baumard, Mascaro, & Chevallier, 2012; Mascaro, Kiura, & Baumard, 2013; Rizzo, Elenbass, Cooley, & Killen, 2016). However, many questions still persist as to children's developing moral principles of fairness, specifically with regard to merit. Most importantly, few studies have attempted to disentangle effort from outcome: in most of the previous research, merit is shown through an individual who both worked harder *and* produced a better outcome. As a result, there arises the important question of whether children's reasoning underlying the decision to deviate from equality is based on the effort itself, or on the outcome of that effort. Further, when these two factors are in conflict, it remains unclear which factor children would prioritize in making fairness decisions, which warrants a further study.

CHAPTER 3

Methodology

Participants

Participants included a total number of 100 children who were 3 to 6 year-olds (younger group; $n = 50$) and 7 to 10 year-olds (older group; $n = 50$). Participants were approximately evenly divided between males and females; 52% ($n = 52$) were boys and 48% ($n = 48$) were girls. The sample size was determined using power analyses in G* Power (Faul, Erdfelder, Buchner, & Lang, 2009), given the varied analyses of interest and with the desire to achieve power levels of .80.

Children were recruited from preschools, elementary schools, and Sunday schools in the mid-Atlantic region of the United States serving majority middle SES. The schools children attended were racially/ethnically diverse, where the demographics of children are 31% European-American, 29% Latino, 21% African-American, 14% Asian-American, and 5% multiracial (*2016 US Maryland Report Card, Montgomery County*). Approximate annual family income for the region was 24.6% for <\$50K, 35.5% for \$50-100K, 20.8% for \$100K-150K, 9.3% for \$150K-200K, and 9.8% for >\$200K (*United States Census Bureau*). The research coordinator first reached out to the school principals and explained the details of the study. Once the school voluntarily agreed to participate in the study by signing the school consent form, parental consent forms were distributed to the parents of children 3 to 10 years of age attending the school. Only children with parental consent were allowed to participate in this study. Along with parental consent, each child's verbal consent was obtained before the study begins.

Procedure

Children participated in the study in a quiet room at the schools. First, participants were given an introduction and full instructions before they start the study. They were asked to raise any questions or concerns they may have during the study and were allowed to end their participation at any time. Then, children responded to four hypothetical stories accompanied by brightly colored pictures. Following each story, participants responded to several items regarding children's resource allocation decisions, children's evaluations of teacher's non-meritorious allocation decisions, children's peer preference and children's justifications about their responses. This study used a resource allocation framework, which was to give participants the opportunity to distribute a limited number of resources to peer recipients (i.e., six star stickers). Resources were given to children during resource allocation questions throughout the stories. The full study protocol was reviewed by the Institutional Review Board at the University of Maryland. See Appendix A for Institutional Review Board Approval and Consent forms.

The same protocol using the identical set of measures was administered to the younger participants (3 to 6 years-olds) and older participants (7 to 10 years-olds). However, due to the fact that younger children's language abilities are too limited to fully complete the survey on their own, *interviews* were conducted for the younger children and *surveys* were administered for the older children. Thus, for the younger children, a trained researcher read the stories, asked questions, and wrote down the responses for children in a 1 on 1 interview format. The older children, on the other hand, received a packet of survey, read the stories, responded to the questions, and wrote down the responses on their own. Previous studies have revealed no difference for administration of the instrument in survey or interview format (Hitti, Mulvey, Rutland, Abrams, Killen, 2014). The survey for older children was administered in a small group – approximately less than five children per group – and a trained researcher was present to answer any questions children may have. Both interviews and surveys took about 20 – 25 minutes to complete.

Design

Participants were presented with four hypothetical stories regarding peers who receive a packet of sunflower seeds from their school. Stories were accompanied by brightly colored photos and drawings. Each story had comparison of two peers whose levels of effort and outcome were varied. Table 1 illustrates four possible peer characters (e.g., HH reflects a peer with *High* Effort and *High* Outcome as first alphabet reflects level of effort and the second alphabet reflects level of outcome). The combinations of two peers were assigned differently in each story. Table 2 illustrates which peer was compared to which peer in each of the four stories. Out of the six possible combinations (HH vs. LL; HL vs LL; LH vs. LL; HL vs. LH; HH vs. LH; HH vs. HL), only four combinations were used as two of them were redundant. Details of the each story are as follows.

Children’s understanding of merit: when effort and outcome are confounded (baseline). Story 1 served as a baseline story where effort and outcome were confounded in merit. This story described an instance where one peer had High Effort and High Outcome (HH) whereas the other peer had Low Effort and Low Outcome (LL). Thus, the story described a situation where one peer worked very hard to grow the sunflowers (i.e., provided water everyday) and thus grew ten sunflowers, while the other peer did not work very hard to grow the sunflowers (i.e., played with the toys instead of watering the seeds) and thus ended up growing only two sunflowers. The full protocol for Story 1 is described below:

“This is Chris and this is Jordan. They are children your age. Their school gave everyone a package of sunflower seeds so that children can grow many sunflowers. Chris and Jordan each planted all of their seeds in a pot. Chris worked very hard to grow plants and gave them water everyday. Jordan did not work hard to grow plants and did not give them any water. One month later, Chris grew 10 sunflowers, because she worked very hard to water them. Jordan only grew 2 sunflowers because she did not work hard to water them.”

Children’s understanding of merit: controlling for outcome. Story 2 described instances where effort and outcome were no longer confounded in merit. More specifically, this story was designed to control for outcome in describing merit. Thus, in Story 2, only the level of effort was varied and the level of outcome was the same. This story described an instance where one peer had High Effort and Low Outcome (HL) whereas the other peer had Low Effort and Low Outcome (LL). Here, the level of outcome was controlled to be low. Thereby, the story depicted a situation where one peer worked very hard to grow the sunflowers but grew only two sunflowers, while the other peer did not work very hard and also grew two sunflowers. The full protocol for Story 2 is described below:

“This is Sam and this is Alex. They are children your age. Their school gave everyone a package of sunflower seeds so that children can grow many sunflowers. Sam and Alex each planted all their seeds in a pot. Sam worked very hard to grow plants and gave them water everyday. However, Alex did not work hard and did not give them any water. One month later, Sam only grew 2 sunflowers, although she worked very hard to water them. Alex only grew 2 sunflowers because she did not work hard to water them.”

Children’s understanding of merit: controlling for effort. Story 3 also described instances where effort and outcome were no longer confounded in merit. However, this time, this story was designed to control for effort in describing merit. Thus, in Story 3, only the level of outcome was varied and the level of effort was the same. This story described an instance where one peer had Low Effort and High Outcome (LH) whereas the other peer had Low Effort and Low Outcome (LL). Here, the level of effort was controlled to be low. Thereby, the story depicted a situation where one peer did not work very hard to grow the sunflowers but grew ten sunflowers, while the other peer also did not work very hard and grew two sunflowers. The full protocol for Story 3 is described below:

“This is Taylor and this is Dana. They are children your age. Their school gave everyone a package of sunflower seeds so that children can grow many sunflowers. Taylor and Dana each planted all their seeds in a pot. Taylor did not work hard to grow plants and did not give them any water. Dana also did not work hard to grow plants and did not give them any water. One month later, Taylor grew 10 sunflowers, although she did not work hard to water them. Dana grew 2 sunflowers because she did not work hard to water them.”

Children’s understanding of merit: giving priority to effort or to outcome. Finally, Story 4 described an instance where there was a tension between effort and outcome. That is, this story described an instance where one peer had High Effort and Low Outcome (HL) whereas the other peer had Low Effort and High Outcome (HL). Thus, one peer worked very hard to grow the sunflowers but only grew two sunflowers, while the other peer did not work very hard but grew ten sunflowers. The full protocol for Story 4 is described below:

“This is Casey and this is Morgan. They are children your age. Their school gave everyone a package of sunflower seeds so that children can grow many sunflowers. Casey and Morgan each planted all their seeds in a pot. Casey worked very hard to grow plants and gave them water everyday. Morgan did not work hard to grow plants and did not give them any water. One month later, Casey only grew 2 sunflowers, although she worked very hard to water them. Jordan grew 10 sunflowers, although she did not work hard to water them.”

After hearing or reading each story, children were given six star stickers. Then, children were asked to distribute these to the two peers in what they believed is the fairest way. To ensure that there was no story order effect, story order was counter-balanced; approximately half of the participants received stories in the order of 4 – 3 – 2 – 1, while the other half of the participants received stories in the order of 1 – 2 – 3 – 4. The gender of protagonists in the stories was matched to the participant’s gender. The entire survey can be found in Appendix C.

Measures

Following each story, participants responded to several questions. Specifically, four dependent measures (within-subject) will be assessed: a) *Children's own resource allocation and justifications*, b) *Children's preference between the Two Peers*, c) *Evaluation of Authority's non-Meritorious Allocation Decisions only for Story 1, 2, and 3*, and d) *Evaluation of Authority's Allocation Decision based on Effort (or Outcome) only for Story 4*.

Children's own resource allocation. After hearing or reading each story for all four stories, children were given six stars to allocate between two peers to assess children's own resource allocation decisions. Children were asked the following questions: 1) "Based on what you just heard/read, here are six stars for you to give out. Can you show me how many stars [Peer 1] and [Peer 2] should each get?" and 2) "Can you tell me why you gave out stars like this?", which asks the justification for their allocation decisions. These questions were asked for all four stories. In addition, only for Story 4 (i.e., vignette where there is a tension between effort and outcome), children were prompted with a follow-up question: "I just found one more star here! If you can give this star to [peer 1] or [peer 2], who would you give this to?" This was asked in order to assess which factor – effort or outcome – children prioritized in their allocation decisions when framed in a forced choice context.

Reasoning coding. The open-ended justifications were coded into four different categories for further analyses. The four categories from pilot data are: 1) *emphasis on effort* (e.g., "I'm giving more to him because he clearly worked much harder to water the plants"), 2) *emphasis on outcome* (e.g., "He deserves more stars because he grew 10 flowers but he – the other peer – only grew 2 flowers"), 3) *emphasis on both effort and outcome* (e.g., "Although they grew the same number of flowers, he worked harder than him"), and 4) *strict abidance to equality* (e.g., "I will give them each 3 stars because she will be sad if she gets less"). Uncodable responses were dropped.

Categories that were used were assigned a score of 1, and those that were not were assigned a score of 0. Two coders blind to the hypotheses of the study completed the coding of open-ended reasoning responses. Interrater reliability was determined using a subset of 20% of the data; Cohen's $\kappa = .86$ for interrater reliability.

Children's preference between the two peers. Across all four stories, children were asked to choose which of the two peers in the story children preferred to work with for a hypothetical future flower-growing task. This measure was implemented to examine whether children took merit into account when making a decision that relates to their self-gain (e.g., children earn some extra stars themselves from pairing up with a partner). Thus, children were asked: "Let's say it is your turn to grow sunflowers and you have a chance to get some extra stars! You can ask one of these two children to grow flowers with you. Who would you want to grow flowers with, [peer 1] or [peer 2]?"

Evaluation of authority figure's non-meritorious allocation decisions. In the first three stories where meritorious peer is salient (e.g., a hardworking and productive peer for Story 1 a hardworking peer for Story 2; and a productive peer for Story 3), children were asked to evaluate a teacher's allocation decisions that did not incorporate merit into their allocation decisions. This measure was not administered for the last story as Story 4 did not have one particular meritorious peer (i.e., this story showed two competing merits). In the first three stories, teachers' non-meritorious allocation decisions were shown in two different contexts: 1) an equal allocation, and 2) an allocation decisions against merit.

Equal allocation. Here, children were asked to hypothesize a situation where a teacher would give equal amount of resources to two peers regardless of the level of effort or outcome. Thus, children heard or read: "Let's say one teacher says, "I'm going to give 3 stars to [peer 1] and 3 stars to [peer 2] because I always give the same amount to everyone. How

OK or not OK is it for her to give equal stars to two peers?" The responses were recorded on a 6-point scale from 1 = Really Not Okay to 6 = Really Okay.

Allocation against merit. Next, children were asked to hypothesize a situation where a teacher would give more resources to a non-meritorious peer (i.e., someone who did not deserve resources).

Thus, in Story 1, children were asked: "Let's say one teacher says, I'm going to give 1 star to Chris and 5 stars to Jordan because I always give more to the one who did not work hard and did not grow many flowers. How OK or not OK is it for her to give more to Jordan?"

In Story 2 where outcome is controlled for, children were asked: "Let's say one teacher says, I'm going to give 1 star to Sam and 5 stars to Alex because I always give more to the one who did not work hard. How OK or not OK is it for her to give more to Alex?"

In Story 3 where effort is controlled for, children were asked: "Let's say one teacher says, I'm going to give 1 star to Taylor and 5 stars to Dana because I always give more to the one who did not grow many flowers. How OK or not OK is it for her to give more to Dana?". All responses were recorded on a 6-point scale from 1 = Really Not Okay to 6 = Really Okay.

Evaluation of authority's allocation decision based on effort (or outcome). In Story 4 where there was a tension for two components of merit, effort and outcome, children were asked to evaluate an authority's allocation decision based on effort, followed by an authority's allocation decision based on outcome. Thus, the first question which measured children's judgment on authority's effort-based allocation was framed as: "Let's say one teacher says, "I'm going to give 5 stars to Casey and 1 star to Morgan because I always give more to the one who worked harder rather than the one who grew more flowers. How OK or not OK is it for her to give more to Casey?". Then, the second question which measured children's judgment on authority's outcome-based allocation was framed as: "Let's say one

teacher says, “I’m going to give 5 stars to Morgan and 1 star to Casey because I always give more to the one who grew more flowers rather than the one who worked harder. How OK or not OK is it for her to give more to Morgan?”. Children’s responses were recorded on a 6-point scale from 1 = Really Not Okay to 6 = Really Okay.

Plan of Data Analysis

The study used set of univariate analyses of variance (ANOVA), repeated measures ANOVAs, t-tests, binominal tests, and chi-square tests. Specifically, univariate ANOVAs were conducted to examine differences by age group in children’s allocation decisions based on merit; repeated measures ANOVAs were conducted to examine children’s reasoning data, t-tests were conducted to see whether children’s resource allocation decisions deviate from equal allocation; binomial tests were conducted to test whether responses from two choice options (e.g., choosing a preferred peer for a further task) were different from the probability of responding by chance (50%); and a series of chi-square tests of association were conducted to determine differences by age group in children’s choice.

CHAPTER 4

Results

The following results section revealed children's understanding of merit in the following contexts: a) when effort and outcome were confounded (baseline), b) when outcome was controlled (i.e., when the level of effort was varied), c) when effort was controlled (i.e., when the level of outcome was varied), and d) when given the opportunity to prioritize either effort or outcome. A set of measures are analyzed in all four contexts.

Children's understanding of merit: when effort and outcome are confounded (baseline)

Resource allocation decisions and justifications. Children's allocation decisions with six resources were documented in Story 1 where the meritorious peer had high effort and high outcome (HH) (i.e., hardworking and productive) whereas the non-meritorious peer had low effort and low outcome (LL) (i.e., lazy and unproductive). To examine whether children regarded merit based on both *effort* and *outcome* as an important factor to deviate from equality, independent-samples t-test was conducted to compare if the number of stars children allocated to the meritorious peer was different from the midpoint of 3 (i.e., equal allocation). The findings revealed that both 3 to 6 year-olds ($M = 4.08$, $SD = 1.35$; $t(49) = 5.65$, $p < .001$) and 7 to 10 year-olds ($M = 5.08$, $SD = .88$; $t(49) = 16.77$, $p < .001$) allocated more stars to the meritorious peer who worked harder and grew more flowers.

To examine the age difference in children's allocation decisions, an univariate ANOVA was conducted with number of stars allocated to a meritorious peer as dependent variables and the Age Group as a fixed factor. A significant main effect of age was revealed, $F(1, 98) = 19.24$, $p < .001$, $\eta_p^2 = .16$. Pair-wise comparisons showed that 7 to 10 year-olds were more likely to allocate more stars the meritorious peer who worked harder and grew more flowers than 3 to 6 year-olds (see Figure 1).

To understand children's reasoning, children's justification responses were coded into four categories: Emphasis on effort, Emphasis on outcome, Emphasis on both effort and outcome, and preference for strict equality. Endorsement of each category (in proportions) is presented in Table 3. To examine whether children reasoning differed across age, a 2 (Age: 3 to 6 year-olds, 7 to 10 year-olds) \times 4 (Reasoning: Emphasis on effort, Emphasis on outcome, Emphasis on both effort and outcome, Preference for strict equality) ANOVA with repeated measures on the last factor was conducted. An interaction effect for Age \times Reasoning was found, $F(3, 294) = 9.65, p < .001, \eta_p^2 = .09$. Older children referenced the emphasis on both effort and outcome ($M = .58, SE = .06$) at significantly higher proportions than younger participants ($M = .14, SE = .06$) ($p < .001$). Reasoning that focused on the importance of both effort and outcome included: "She deserved more stars because she put more work into it and plus grew more flowers", "More work and more flowers should receive more". These findings revealed that older children are more likely to regard *merit based on effort and outcome* as an important and legitimate factor to deviate from equality than younger children. Other reasoning did not reveal any age differences.

Preference between the two peers. Children's responses when they were asked to choose which peer they would like to work with in a future task were analyzed using a set of binominal tests. The findings from Story 1 revealed that a majority of 3 to 6 year-olds (80%, $n = 40$) and 7 to 10 year-olds (96%, $n = 48$) preferred to work with the meritorious peer who worked harder and grew more flowers (HH) over the non-meritorious peer who was lazy and did not grow more flowers (LL) (both $ps < .001$). To examine the age differences in children's preference for a peer, a Chi-square test was conducted and revealed a significant difference in the responses between age groups, $\chi^2(1, N = 100) = 6.06, p = .014$. The results indicated that 7 to 10 year-olds showed a stronger desire to work with the meritorious peer over the non-meritorious peer than 3 to 6-year-olds (see Figure 2).

Children's evaluations of authority figure's non-meritorious allocation. Another main interest of the proposed study was to document whether children would agree with or reject an authority figure's non-meritorious resource allocation decision. Such allocation decisions from teachers were described to be: a) an equal allocation (i.e., thereby disregarding different levels of merit) and b) an allocation in opposition to meritorious allocation.

Teachers' allocation based on strict equality. In Story 1, children were asked how okay or not okay the teacher's allocation based on strict equality was (i.e., giving the same amount of stars to both peers) when effort and outcome were confounded in merit. To investigate whether children would reject an authority's equal allocation decision, independent t-tests were conducted. The findings revealed that 3 to 6 year-olds ($M = 4.24$, $SD = 2.01$) judged that it is *okay* to give equally to two peers, $t(45) = 2.49$, $p = .017$. In contrast, 7 to 10 year-olds ($M = 2.90$, $SD = 1.33$) judged that it is *not okay* to give equally to two peers, $t(47) = -3.16$, $p = .003$. A univariate ANOVA showed that children judged a teacher's equal allocation as *less okay* with age, $F(1, 92) = 14.72$, $p < .001$, $\eta_p^2 = .14$ (see Figure 3).

Teachers' allocation against merit. Children were then asked how okay or not okay the teacher's allocation against merit was (i.e., giving more stars to the hardworking and productive peer over lazy and unproductive peer) when effort and outcome were confounded in merit in Story 1. Independent t-tests were conducted to investigate whether children would reject an authority's allocation decision against merit. The findings revealed that 3 to 6 year-olds ($M = 2.32$, $SD = 1.76$) judged that it is *not okay* to give more stars to the non-meritorious peer who was lazy and grew less flowers, $t(49) = -4.76$, $p < .001$. Similarly, 7 to 10 year-olds ($M = 1.30$, $SD = .68$) judged that it is *not okay* to give more stars to the non-meritorious peer who was lazy and grew less flowers, $t(49) = -22.96$, $p < .001$. Univariate ANOVA showed that children judged a teacher's non-meritorious allocation as *less okay* with age, $F(1, 98) = 14.70$, $p < .001$, $\eta_p^2 = .13$ (see Figure 4).

Children's understanding of merit: controlling for outcome

Resource allocation decisions and justifications. In Story 2 where outcome was controlled (i.e., only the level of effort was varied between the two peers), children's allocation decisions with six resources were documented. The level of outcome was controlled to be low. Thus, the meritorious peer had high effort and low outcome (HL) (i.e., hardworking and unproductive) whereas the non-meritorious peer had low effort and low outcome (LL) (i.e., lazy and unproductive). To examine whether children regarded merit based only on *effort* as an important factor to deviate from equality, independent t-test was conducted. Findings revealed that both 3 to 6 year-olds ($M = 3.46$, $SD = 1.06$; $t(49) = 3.09$, $p = .003$) and 7 to 10 year-olds ($M = 4.34$, $SD = 1.02$; $t(49) = 9.45$, $p < .001$) allocated more stars to the meritorious peer with greater effort (i.e., worked harder to grow flowers) than the non-meritorious peer with less effort (i.e., lazy in growing flowers) when both peers grew the same small number of flowers.

To examine the age difference in children's allocation decisions, an univariate ANOVA test was conducted. The findings revealed an age related change, $F(1, 98) = 18.31$, $p < .001$, $\eta_p^2 = .16$ (see Figure 1). Specifically, pair-wise comparison indicated that 7 to 10 year-olds were more likely to prefer the meritorious peer who worked harder than 3 to 6 year-olds in their allocation decisions, $F(1, 98) = 18.31$, $p < .001$, $\eta_p^2 = .16$ (see Figure 1).

To examine whether children reasoning differed across age, a 2 (Age: 3 to 6 year-olds, 7 to 10 year-olds) \times 4 (Reasoning: Emphasis on effort, Emphasis on outcome, Emphasis on both effort and outcome, Preference for strict equality) ANOVA with repeated measures on the last factor was conducted. An interaction effect for Age X Reasoning was found, $F(3, 294) = 11.29$, $p < .001$, $\eta_p^2 = .15$ which revealed age differences for all four justification categories. First, older children referenced *emphasis on effort* ($M = .64$, $SE = .06$) at significantly higher proportions than younger participants of 3 to 6 year-olds ($M = .28$, $SE =$

.07) ($p < .001$). Reasoning that focused on the importance of effort included: “Because it's not fair if the person who worked hard got less and the person who didn't work got more”, “Because all you have to do is try your best”. Next, younger children referenced *emphasis on outcome* ($M = .36, SE = .06$) at significantly higher proportions than older participants of ($M = .12, SE = .06$) ($p = .005$). Reasoning that focused on the importance of outcome included: “Because they grew an equal amount of flowers so it is fair that they receive the same”. Further, older children referenced *emphasis on both effort and outcome* ($M = .24, SE = .05$) at significantly higher proportions than younger participants ($M = .02, SE = .04$) ($p = .001$). Reasoning that focused on the importance of both effort and outcome included: “Sam gets only a little more stars because he worked harder than Alex. But at the same time, Sam got two, just like Alex”. Lastly, younger children referenced *emphasis on strict equality* ($M = .12, SE = .03$) at significantly higher proportions than older participants ($M = 0, SE = .03$) ($p = .011$). Examples of reasoning that focused on the strict equality: “Because if everyone gets equal then neither of them will be sad”. These justification revealed that older children are more likely to focus on effort when they reason about fairness compared to younger children, whereas younger children are more likely to emphasize outcome or strict equality compared to older children.

Preference between the two peers. When outcome was controlled, children's responses on peer preference were analyzed using a set of binominal tests. The findings revealed that 3 to 6 year-olds did not prefer either peer ($p = .20$). However, 7 to 10 year-olds (98%, $N = 49$) preferred to work with the meritorious peer who was hardworking and unproductive (HL) over the non-meritorious peer who was lazy and unproductive (LL) ($p < .001$). To examine the age differences in children's preference for a peer, a Chi-square test was administered and it revealed a significant age difference, $\chi^2 (1, N = 100) = 21.76, p < .001$. The result indicated that 7 to 10 year-olds had a greater preference to work with the

peer who was hardworking over the peer who did not work hard than did 3 to 6 year-olds (see Figure 2).

Children's evaluations of authority figure's non-meritorious allocation.

Teachers' allocation based on strict equality. When outcome was controlled, children were asked how okay or not okay the teacher's allocation based on strict equality was (i.e., giving the same amount of stars to both peers). To investigate whether children would reject an authority's equal allocation decision, independent t-tests were conducted. The findings revealed that 3 to 6 year-olds ($M = 4.72$, $SD = 1.77$) judged that it is *okay* to give equally to two peers, $t(45) = 4.66$, $p < .001$. In contrast, 7 to 10 year-olds ($M = 3.67$, $SD = 1.48$) judged that it is neither okay nor not okay to give equally to two peers, $p = .43$. Univariate ANOVA showed that children judged a teacher's equal allocation as *less okay* with age, $F(1, 90) = 9.41$, $p = .003$, $\eta_p^2 = .10$ (see Figure 3).

Teachers' allocation against merit. When outcome was controlled, children were then asked how okay or not okay the teacher's allocation against merit was (i.e., giving more stars to the hardworking and unproductive peer over lazy and unproductive peer) in Story 2. Independent t-tests were conducted to investigate whether children would reject an authority's allocation decision against merit. The findings revealed that both 3 to 6 year-olds ($M = 2.32$, $SD = 1.85$; $t(49) = -4.52$, $p < .001$) and 7- to- 10-year-olds ($M = 1.60$, $SD = .73$; $t(49) = -18.44$, $p < .001$) judged that it is *not okay* to give more stars to the non-meritorious peer who did not work hard, $t(49) = -4.52$, $p < .001$. Univariate ANOVA showed that children judged a teacher's non-meritorious allocation as *less okay* with age, $F(1, 98) = 12.96$, $p = .012$, $\eta_p^2 = .06$ (see Figure 4).

Children's understanding of merit: controlling for effort

Resource allocation decisions and justifications. In Story 3 where only the level of outcome was varied (i.e., effort was controlled), children's allocation decisions with six

resources were documented. The level of effort was controlled to be low. Thus, the meritorious peer had low effort and high outcome (LH) (i.e., lazy and productive) whereas the non-meritorious peer had low effort and low outcome (LL) (i.e., lazy and unproductive). To examine whether children regarded merit based only on *outcome* as an important factor to deviate from equality, independent t-tests was conducted. Findings showed that both 3 to 6 year-olds ($M = 3.68, SD = 1.06; t(49) = 4.54, p < .001$) and 7 to 10 year-olds ($M = 3.30, SD = .61; t(49) = 3.45, p = .001$) allocated more stars to the meritorious peer with greater outcome (i.e., grew more flowers) when the levels of effort were the same for both peers.

To examine the age difference in children's allocation decisions, an Univariate ANOVA was conducted and revealed a significant age related finding, $F(1, 98) = 4.82, p = .03, \eta_p^2 = .05$, which showed that 7 to 10 year-olds were *less* likely to prefer the meritorious peer who grew more flowers than 3 to 6 year-olds in their allocation decisions, when both peers worked the same (see Figure 1).

To examine whether children reasoning differed across age, a 2 (Age: 3 to 6 year-olds, 7 to 10 year-olds) \times 4 (Reasoning: Emphasis on effort, Emphasis on outcome, Emphasis on both effort and outcome, Preference for strict equality) ANOVA with repeated measures on the last factor was conducted. Older children referenced *emphasis on effort* ($M = .64, SD = .07$) at significantly higher proportions than younger participants ($M = .28, SD = .07$) ($p < .001$). Reasoning that focused on the importance of effort included: "because they both did not work hard", "They didn't work or give water so they are equal". This reasoning highlighted that with age, children are better able to acknowledge the importance of effort: even when it was the outcome that varied between the two peers, older children were more likely to focus on the effort (i.e., that both peers did not work hard and thus resources should be allocated based on this) compared to younger children.

Preference between the two peers. Children's responses on peer preference were analyzed. Binominal analyses was conducted to examine whether children preferred to work with the meritorious peer when effort was controlled. The findings revealed that both 3 to 6 year-olds (76%, $N = 38$) and 7 to 10 year-olds (88%, $N = 44$) preferred to work with the meritorious peer who was lazy but grew more flowers (LH) over the non-meritorious peer who was lazy and unproductive (LL) (both $ps < .001$). Chi-square did not reveal a significant age difference (see Figure 2).

Children's evaluations of authority figure's non-meritorious allocation.

Teachers' allocation based on strict equality. When effort was controlled, children were asked how okay or not okay the teacher's allocation based on strict equality was (i.e., giving the same amount of stars to both peers) in Story 3. To investigate whether children would reject an authority's equal allocation decision, independent t-tests were conducted. The findings revealed that 3 to 6-year-olds ($M = 5.11$, $SD = 1.51$) judged that it is *okay* to give equally to two peers, $t(45) = 7.23$, $p < .001$. Similarly, 7–10-year-olds ($M = 4.56$, $SD = 1.10$) also judged that it is *okay* to give equally to two peers, $t(44) = 6.45$, $p < .001$. Univariate ANOVA did not reveal an age difference in children's judgment of a teacher's equal allocation ($p = .79$) (see Figure 3).

Teachers' allocation against merit. When effort was controlled, children were then asked how okay or not okay the teacher's allocation against merit was (i.e., giving more stars to the lazy and productive peer over lazy and unproductive peer) in Story 3. Independent t-tests were conducted to investigate whether children would reject an authority's allocation decision against merit. The findings revealed that both 3 to 6 year-olds ($M = 2.22$, $SD = 1.79$; $t(49) = -5.06$, $p < .001$) and 7 to 10 year-olds ($M = 2.30$, $SD = 1.22$; $t(49) = -6.98$, $p < .001$) judged that it is *not okay* to give more stars to the non-meritorious peer who grew less flowers. No significant age difference was found ($p = .79$) (see Figure 4).

Children's understanding of merit: giving priority to effort or to outcome

Resource allocation decisions and justifications. In Story 4 where there was a tension between effort and outcome, children's allocation decisions with six resources were documented. That is, this story described an instance where one peer had High Effort and Low Outcome (HL) whereas the other peer had Low Effort and High Outcome (HL); thus, two competing factors were salient. In order to examine whether children made meritorious allocation decisions based on effort over outcome (or outcome over effort), the independent t-tests were conducted. The findings revealed that 3 to 6 year-olds did not deviate significantly from an equal allocation of stars ($M = 2.98$, $SD = 1.46$), $p = .92$; however, 7 to 10 year-olds allocated significantly more stars ($M = 4.1$, $SD = 1.4$) to the peer with greater effort (and less outcome) than to the peer with greater outcome (and less effort); $t(42) = 5.54$, $p < .001$.

To examine whether there was an age difference in children's allocation decisions, an univariate ANOVA was conducted. The findings showed that 7 to 10 year-olds were more likely to prefer the peer who worked harder (and grew less flowers) over the peer who grew more flowers (and did not work as hard) than 3 to 6 year-olds, $F(1, 98) = 15.25$, $p < .001$, $\eta_p^2 = .14$ (see Figure 5).

To understand children's reasoning in their own distribution of stars when effort and outcome had a tension and age-related predictions that older children will use more effort-focused reasoning than younger children, a 2 (Age: 3 to 6 year-olds, 7 to 10 year-olds) \times 4 (Reasoning: Emphasis on effort, Emphasis on outcome, Emphasis on both effort and outcome, Preference for strict equality) ANOVA with repeated measures on the last factor was conducted. An interaction effect for Age \times Reasoning was found, $F(3, 294) = 8.02$, $p < .001$, $\eta_p^2 = .08$. Older participants referenced the emphasis on effort ($M = .62$, $SD = .07$) at significantly higher proportions than younger participants ($M = .26$, $SD = .07$) ($p < .001$). Reasoning that focused on the importance of effort included: "It depends on how they worked

and not about the number”, “Only Casey worked hard and I emphasize on their effort”. However, younger participants ($M = .26, SD = .05$) placed an emphasis on outcome ($M = .08, SD = .05$) at significantly higher proportions than older participants ages ($M = .08, SD = .05$) ($p = .02$). Reasoning that focused on the importance of outcome included: “He should get more stars because he has a lot more flowers and that is what matters”. These reasoning highlighted that while effort was more likely to be considered as an important and legitimate moral criterion in fairness decisions for older children than younger children, outcome was considered as a more important fairness criterion for younger children compared to the older children. Other reasoning did not reveal any age differences.

Forced-choice resource allocation decision. In addition, children were given one extra star to give out to either the effort-peer (i.e., HL: the peer with greater effort and less outcome) or the outcome-peer (i.e., LH: the peer with greater outcome and less effort) ($p < .001$). In order to examine which component of merit – effort or outcome – children would prioritize by giving out the additional resource, binominal analyses were conducted. The findings revealed that 3 to 6 year-olds did not show a significant preference for either peer (effort-peer: 60%, $N = 30$) ($p = .20$). However, a majority of 7 to 10 year-olds (86%, $N = 43$) gave their extra star to the effort- peer (HL) than to the outcome-peer (LH) ($p < .001$). This age-related change was supported in the Chi-square test: 7 to 10 year-olds were more likely to prefer the peer who worked hard (but gained less) than the peer who gained more (but worked less) than 3 to 6 year-olds in their allocation decisions, $\chi^2(1, N = 100) = 8.57, p = .003$.

Preference between the two peers. To examine which peer – a peer with effort or a peer with outcome – children would prefer to work with on a hypothetical task, binominal analyses were conducted. The findings revealed that 3 to 6 year-olds did not prefer either peer ($p = .20$), while 7 to 10 year-olds (90%, $N = 45$) preferred to work with the effort-peer (HL)

(i.e., who worked harder and grew less flowers) over the outcome-peer (LH) (i.e., who grew more flowers and did not work hard) ($p < .001$). To investigate whether there is an age related change in children's preference for a peer, a Chi-square test was conducted. Results revealed a significant age difference, indicating that 7 to 10 year-olds showed a stronger preference for the high effort-peer over the high outcome-peer, than did 3 to 6 year-olds, $\chi^2(1, N = 100) = 12.00, p = .001$ (see Figure 6).

Children's evaluations of authority figure's allocation. Lastly, children's acceptability responses were documented regarding an authority figures' allocation preferring effort, followed by an authority figures' allocation preferring outcome.

Children's evaluations of authority figure's effort-based allocation. First, teacher's allocation based on *effort* over outcome was introduced. Here, in order to examine whether children judged the teacher's allocation decision preferring effort to be acceptable, the independent t-tests were conducted. The findings revealed that 3- to 6-year-olds ($M = 3.62, SD = 2.16$) judged it was neither good nor bad for a teacher to give more stars to the hardworking peer (who grew less flowers) over the peer who grew more flowers (but did not work hard) ($p = .71$). However, 7- to 10-year-olds ($M = 4.24, SD = 1.35$) judged that it was okay to give more stars to the hardworking peer (who grew less flowers) than the peer who grew more flowers (but did not work hard), $t(44) = 3.70, p < .001$. Though, Univariate ANOVA did not show any significant age difference ($p = 1.00$) (see Figure 7).

Children's evaluations of authority figure's outcome-based allocation. Next, teacher's allocation based on *outcome* over effort was introduced. Here, in order to examine whether children judged the teacher's allocation decision preferring outcome to be acceptable, the independent t-tests were conducted. The findings revealed that 3- to 6-year-olds ($M = 2.58, SD = 1.91$) judged that it is *not okay* to give more stars to the peer who grew more flowers (but did not work as hard) than the hardworking peer (who grew less flowers),

$t(49) = -3.41, p = .001$. 7- to 10-year-olds ($M = 1.96, SD = .96$) also judged that it is *not okay* to give more stars to the peer who grew more flowers (but did not work as hard) over the hardworking peer (who grew less flowers), $t(49) = -11.28, p < .001$. To examine the age difference in children's acceptability judgment, an univariate ANOVA was conducted. The findings showed that children judged a teacher's allocation based on outcome over effort as *less okay* with age, $F(1, 97) = 4.17, p = .04, \eta_p^2 = .04$ (see Figure 8).

CHAPTER 5

Discussion

The current study investigated children's understanding of two important components that contribute to decisions regarding the fair allocation of resources: effort (how hard one works) and outcome (how much one produces). Previous research on children's understanding of merit has shown that, with age, children increasingly regard merit as a legitimate reason to deviate from strict equality when allocating resources (Baumard et al., 2012; Hamann, Bender, & Tomasello, 2014; Kanngiesser & Warneken, 2012). One limitation of previous research on this topic, however, is that many studies confound one's effort towards accomplishing a goal with the outcomes associated with the goal. Yet, the relation between effort (how hard one works) and outcomes (how much one produces) is not always correlated. As an illustration, one can be lazy but have a high amount of product due to a windfall or an accident. At the same time, one can work hard and have a low amount of produce due to an unlucky circumstance. One goal of the current project was to disentangle these two central aspects of decisions regarding the fair allocation of resources.

To examine this goal, multiple measures of children's evaluations and reasoning were administered including children's own meritorious allocation decisions, children's preference for a meritorious peer in a hypothetical future task, and children's evaluations of teacher's allocation decisions. The novel findings from the current study revealed that, with age, children gave priority to one's effort (hard-working) over the outcome (how much was produced) when incorporating merit into their fairness decisions. That is, as their conceptions of fairness develop, children were more likely to judge that a person who gave greater effort should receive more resources than a person with a greater outcome. Further, even when effort and outcome were controlled, children still incorporated merit into their fairness allocation decisions.

In addition, in line with previous research (Laupa, Turiel, & Cowan, 1995; Turiel, 1983;1998), children across multiple ages maintained these fairness decisions regardless of authority endorsement of an unfair treatment, if the authority message was directly opposite to merit. That is, children as young as three years of age actively rejected authority figures' allocation decisions if they were against merit (e.g., giving more to the less hardworking peer over the hardworking peer). However, children's fairness decisions independent of authority messages were not salient when authority advocated an equal treatment to all. That is, when authority figures allocated resources equally by disregarding different levels of effort and outcome, younger children agreed with the authority's decision, while older children did not. This showed that young children had somewhat limited ability to understand merit under the influence of an authority whereas older children's decisions were apart from authority figures' input. The main findings are discussed below in greater detail.

Children's Understanding of Merit: Giving Priority to Effort or to Outcome

A central question for the research project was whether and how children would evaluate (and allocate) resources when there was a tension between effort and outcome in the last scenario. For example, when one target character had high effort with low outcome (e.g., hardworking but had few flowers) and another target character had low effort with high outcome (e.g., lazy but had lots of flowers), younger children's distribution decisions were not different from an equal allocation, revealing their competing concerns for effort and outcome. This finding suggested that younger children preferred to give the same amount of resources to a hard-working peer and to a productive peer rather than prioritizing one over the other. In addition, when children were introduced to a force-choice question where they could give one extra resource to one of the two peers, younger children did not prioritize either peer. Similarly, when younger children were asked to choose a peer for a hypothetical task to

earn extra stars, children were split between choosing the hardworking peer and the productive peer.

These findings suggested that younger children experience difficulty in weighing one component of merit over another when effort and outcome are both salient. Such children's competing concerns for effort and outcome were also shown in children's evaluations of an authority's allocation decision: when a teacher allocated more stars to the more hardworking (and less productive) peer, children judged that this is neither okay nor not okay. However, although children seemed to be uncertain about which principle should take priority in their decisions concerning distributive justice, one dimension of young children's preference for effort was revealed: when a teacher allocated more stars to the more productive (and less hardworking) peer, children judged that this was not okay, indicating their disinclination towards an authority giving credit to productivity over effort. These findings on young children altogether indicated that when effort and outcome are contrasted, 3 to 6 year-olds overall showed strong competing concerns for both effort and outcome, with a slight sign of preference for effort in some limited contexts.

However, a significantly different finding was revealed for the older children, indicating a developmental shift in weighing effort and outcome. Older children showed a strong preference for a peer with higher effort and a lower outcome (i.e., hardworking but had few flowers) over a peer with a higher outcome and a lower effort (lazy but had lots of flowers). This was supported in a diverse set of measures: older children allocated more resources to a hardworking peer than a productive peer in their own allocation decisions, judged an authority's allocation that prioritized the hardworking peer as positive, judged an authority's allocation that prioritized the productive peer as negative, and preferred to work with a hardworking peer over a productive peer in a hypothetical task. Further, when children were introduced to a force-choice question where they could give one extra resource to one of

the two peers, a majority of older children (86%) judged that a hardworking peer deserved resources more than the productive peer, unlike younger children who did not prioritize either peer.

This implied that when older children made evaluations on the same situation where there were two competing components of merit, older children prioritized the positive intentional aspects of an act rather than the positive consequences as a given result. This set of findings reflected that, as children's conceptions of fairness develop with age, children gain better understanding of which component of merit they value in a school-related learning context.

Children's reasoning for their allocation decisions also supported children's increasing awareness of concerns for merit. Older children put emphasis on effort at significantly higher proportions than younger children and gave justifications such as "only she worked hard and I emphasize on the effort". However, younger children put emphasis on outcome at significantly higher proportions than older children and gave justifications such as "he has a lot more flowers and that is what matters". Older children regarded *effort* as a critical criterion for making fairness decisions more so than productivity and considered effort a legitimate reason to deviate from equality more so than younger children.

These findings on children's distribution decisions and justifications showed which components of merit children valued more in the context of school-related learning activities, such as the flower growing task used in the study. Older children's preference for effort over outcome could be explained through children's developing acknowledgment of intentions with age (e.g. Helwig, Zelazo, & Wilson, 2001; Piaget, 1932; Zelazo, Helwig, & Lau, 1996) along with their increasing social-cognitive abilities, such as the competence to coordinate competing forms of moral reasoning (i.e., hardworking but less productive) (see Killen & Rutland, 2011). Unveiling the age trend in children's consideration of merit is an important

contribution to the current literature on children's understanding of fairness. As noted earlier, most of previous research often introduced a meritorious peer as both hardworking and productive (e.g. Baumard et al., 2012; Blake, McAuliffe, & Warneken, 2014; Hamann, Bender, & Tomasello, 2014; Kanngiesser & Warneken, 2012). In the real world, this is not always the case: hard-working peers sometimes fail to produce good results, while lazy peers turn out to be highly productive due to diverse factors other than effort, such as luck and other situational factors. The current study was novel in that it captured this real — but understudied — aspect of the world. Importantly, examining children's increasing preference for effort over outcome had a great contribution to the existing literature, as this information revealed the developmental trajectories of children's notions of, and ideas about, the concept of distributive justice.

In addition, although young children failed to prioritize effort over outcome in their fairness decisions, it is worthwhile to note that young children did recognize the importance of both effort and outcome at the same time. While researchers like Piaget (1932) and many other empirical studies (Feinfield, Lee, Flavell, Green, & Flavell, 1999; Helwig, et al., 2001; Powell, Derbyshire, & Guttentag., 2012) suggested that young children made judgments primarily based on outcome and disregarded intentions, the current study revealed that younger children understood both intentions and outcomes and acknowledged importance for both values. In fact, some previous studies highlighted that children start to have some ability to pinpoint the importance of intentions from an early age (Cushman, Sheketoff, Wharton, & Carey, 2013; Killen, Mulvey, Richardson, Jampol, & Woodward, 2011) along with their focus on consequences. Reflecting this line of literature, when given the opportunity to prioritize either intention or outcome, young children placed emphasis on both effort and outcome.

Children's Understanding of Merit: Controlling for Effort and Outcome

Another central goal of this study was to unveil whether children were able to perform meritorious distribution when effort was controlled and when outcome was controlled. The findings revealed that when outcome was controlled (i.e., one peer worked hard and the other peer did not work hard, while both peers got the same result), children judged that the hardworking person deserved more resources than the lazy person, even though both had the same low level of outcome (i.e., small number of flowers). Similarly, when effort was controlled (i.e., one person produced a lot and the other person did not produce a lot, but they worked equally hard), children also made allocation judgments in such a way that the productive person should receive more resources than the non-productive person, even though both peers had the same low level of effort (i.e., lazy).

These findings suggested that children were able to incorporate merit in their fairness decisions even when the two components of merit were separated. Thus, effort alone (or outcome alone) was found to be sufficient enough for children to reach meritorious decisions. This finding reflected that children regarded effort and outcome separately as two important moral principles for fairness judgments. Particularly, because there was an even number of resources (six stars) for children to give out in this study, children could have distributed resources equally to two recipients if they considered that both components of merit were necessary to make a meritorious allocation decision. However, despite this opportunity for equal allocation, children still actively made meritorious allocation decisions, providing evidence that one of the component of merit was sufficient to integrate merit in their fairness decisions. Children's meritorious decision when equal allocation is a possibility also supports the fact that children's consideration of merit stemmed from their full understanding of merit and concern for fairness, and not from a pressure to side with one or the other. The current study's findings further extended prior work which showed that children younger than the

age of 6 years make equitable distribution only when there is no option for equal distribution (Baumard et al., 2012).

The study also revealed interesting age-related findings. When outcome was controlled (i.e., effort was varied), older children (7 to 10 year-olds) were more likely to favor the hardworking peer than were younger children (3 to 6 year-olds). Thus, even though two peers grew the same small number of flowers, older children were more likely to credit the peer who tried hard to grow flowers than the peer who were lazy in growing flowers. This indicated that as children's moral thinking develops with age, children progressively incorporate the intentional aspect behind an act into their moral evaluation (e.g., the good intention to engage in a flower-growing task) and thereby come to better appreciate one's effort, apart from the outcomes of the effort. This was consistent with previous work which emphasized children's increasing ability to understand intentions in their judgments and evaluations (Helwig, Zelazo, & Wilson, 2001; Leslie, Knobe, & Cohen, 2006; Zelazo, Helwig, & Lau, 1996).

However, when effort was controlled (i.e., outcome was varied), the opposite age pattern was found as predicted. In this scenario, one peer grew lots of flowers while the other peer only grew a few flowers and importantly, both peers *did not* work hard. Thus, children's allocation decisions reflected whether children made a connection between productivity and deservingness (i.e., a productive peer deserves more resources than an unproductive peer even though both peers were lazy). Reflecting older children's stronger emphasis on intentional aspect, findings from this study revealed that the older children were less likely to favor the productive character in their allocation decisions than were the younger children. This could also be explained by the prior work that young children are more driven by the consequences than older children and thus are more likely to use consequences of actions in making moral evaluations (Costanzo, Coie, Grumet, & Farnill, 1973).

Children's reasoning regarding their allocation decisions also supported the age-related findings above. When children were asked *why* they allocated resources in that way, older children referenced *effort* more than the younger children in their justifications. They gave explanations such as "it is fair that one gets more if one tried a lot although they grew the same number of flowers" (referencing effort when only effort varied) and "I give them equal because they both did not give water... number of flowers are different but still no one gave water" (referencing effort when only outcome varied). In contrast, younger children referenced *outcome* more than older children in their justifications. Thus, younger children were giving reasons such as, "I gave out the same stars for both because they grew an equal amount of flowers" (referencing outcome when only effort varied) and "she deserves more because she grew a lot more flowers!" (referencing outcome when only outcome varied). It could be that because young children have a limited ability to establish a full understanding of intentions, they have come to prioritize what is visualized (i.e., outcome, which in this study were number of flowers), unlike older children, who have more flexible moral reasoning (Piaget, 1932). Further, consistent with previous studies that younger children prefer equality when distributing the resources (Damon, 1975, 1980; Enright & Sutterfield, 1980; Kohlberg, 1969; McGillicuddy-de Lisi, et al., 1994; Nelson & Dweck, 1977), younger children in this study were more likely to reference the importance of equality in their reasoning than were older children, offering justifications such as "I will give everyone the same and neither of them will be sad."

As previous studies have noted, children's fairness decisions vary depending on how the task is related to concerns for the self (Moore, 2009; Thompson, Barresi, & Moore, 1997). Thus in this study, children's understanding of merit was also documented when their self-interest was at stake to fully capture children's conceptions of fairness regarding merit. When children were asked to choose a peer to collaborate with them for a hypothetical future task

(which was described as resulting in some extra stars for participants themselves), children's peer preferences were parallel to their own resource allocation decisions. Specifically, children across age groups preferred to work with the meritorious peer when outcome was controlled, and also when effort was controlled. This finding revealed that children's understanding of merit was salient not only when children were engaged in third party distribution, but also when self-interest was a factor in their decisions.

Children's Understanding of Merit: When effort and outcome are confounded

As a baseline, this study investigated children's understanding of merit in the context of resource allocation when effort and outcome were correlated (i.e., meritorious peer had greater effort and greater outcome, where non-meritorious peer had less effort and less outcome). Findings supported the previous studies in that children understand merit from an early age and thus regard merit—effort and outcome combined—as a legitimate reason to deviate from equality (Blake, McAuliffe, & Warneken, 2014; Hamann, Bender, & Tomasello, 2014; Melis, Altrichter, & Tomasello, 2013; Rizzo, Elenbaas, Cooley, & Killen, 2016). Not only children allocated more resources towards the meritorious peer, but they also chose the meritorious peer to collaborate on a future task. These findings again corroborated that merit is an important moral criterion for children's fairness judgments in a distributive context when effort and outcome are confounded in merit.

Children's Evaluation of an Authority Figure's Non-Meritorious Allocation Decisions

Another way to investigate children's understanding of a fairness principle regarding merit is to determine how they would respond to authority figures' decisions in a resource allocation context. In particular, when children faced an authority figure's unfair distribution decision about merit (e.g., giving more to someone who does not deserve more) or equal distribution decision disregarding merit (e.g., giving same amount to everyone although one

worked hard), would children judge such authority's decision as unfair and reject it? Or would children abide by the authority figure's decision due to the status of authority?

The social domain theory suggest that children have the ability to distinguish issues on the moral domain, such as social interactions that involve violations of welfare or justice, from other domains like conventional domain (Turiel., 1983). Studies based on this theoretical perspective revealed that children view moral decisions as rule- and authority-independent, indicating that these cannot be changed or altered due to others' opinions or rules even if they come from authority figures, unlike decisions on conventional acts (Killen & Smetana, 2015; Smetana et al., 2014; Laupa, 1994; Laupa, Turiel, & Cowan, 1995).

Supporting this theoretical framework, the current study revealed that when a teacher made a decision that was against fair distribution (i.e., allocating more resources to an peer who deserves less, such as someone who worked less and had less outcome), children judged the teacher's decision to be unacceptable. Both younger and older children disapproved of a teacher's such non-meritorious decisions. When outcome was controlled, children evaluated that giving more to a lazy peer than to a hardworking peer when both peers produced the same amount of product was not acceptable. Similarly, when effort was controlled, children across age also did not approve a teacher's giving more resources to the unproductive peer than to the productive peer when both peers did not work hard. The same pattern was found when effort and outcome were confounded. This revealed an important finding that even younger children of 3 to 6 years of age acknowledged that an unfair treatment in a resource distribution context is wrong even if the authority made the judgment.

In addition, this study also unveiled how children would respond when introduced to an authority figure's *equal* allocation decision (i.e., authority figure allocates three stars to both peers, even though one of them is a meritorious peer). Would children reject a teacher's equal allocation as they did when a teacher made an allocation decision against merit? Or

would children be influenced by teachers' equal decision because this does not directly contrast merit? Interestingly, results showed that young children judged a teacher's equal allocation to be acceptable even when different levels of effort and outcome were at place. That is, even though one peer was clearly meritorious in terms of effort and/or outcome, children were finding a teacher's equal split between the two recipients as fair.

The fact that young children advocated allocation decisions which did not take merit into account was unexpected. This could be partially explained by the prior work which showed that young children prefer an *equality* rule indiscriminately and it is not until 7 or 8 years of age that they become fully able to integrate multiple moral concerns (Damon, 1977; Olson & Spelke, 2008; Piaget, 1932; Sigelman & Waitzman, 1991). This was also in line with what the current study revealed earlier in children's justifications: younger children were more likely than older children to bring up issues on equality in their reasoning for allocation decisions. This finding again support the young children's limited understanding of merit when an authority's avocation for equality was present.

However, it is noteworthy that young children did not allocate resources equally in their *own distribution decisions*, although they supported teacher's equal allocation. Some studies thus far somewhat underestimated young children's ability to consider merit and suggested that that it was not until 6 to 7 years of age that children started to understand merit (Damon, 1977; McGillicuddy-De Lisi, Daly, & Neal, 2006; Sigelman & Waitzman, 1991; Warneken, Lohse, Melis, & Tomasello, 2011). However, the current study stretched the line of work by unveiling that there are indeed certain circumstances that young children are driven to equal allocations, such as when authority's equal decision is salient, but young children still have the capability to integrate merit when there is no influence of authority. Reflecting children's developing understanding of merit, such strict abidance to equality decreased with age as their conceptions of fairness become more concrete.

Study Limitations and Further Directions

This study provides an in-depth understanding of children's willingness to integrate merit into their fairness decisions and how this develops with age. The current study, however, does include some limitations. First, only one type of resource was used in this study. Resources used in the current study were star stickers which children preferred to have, but not resources that were necessary to children's livelihood. These resources were *luxury resources* (e.g., resource that is enjoyable to have, such as toys), rather than *necessary resources* (e.g., resource that is needed avoid harm, such as medicine, water and food) (Rizzo, Elenbaas, Cooley, and Killen., 2016). A study by Rizzo et al. (2016) found that children's consideration of moral principles varied depending on the characteristics of the resources in question; children prioritized merit when allocating luxury resources more so than when allocating necessary resources. This was due to the fact that children had concerns for everyone's welfare and their right to have access to essential resources. Thus, given that children consideration of merit could be dependent on the characteristics of the resources being allocated, further research is needed to investigate whether and how the current study's findings on disentangling effort and outcome would be different when examined with necessary resources such as medicine, water, and food. Because the previous work on the type of resources and children's understanding of merit was restricted to situations where effort and outcome were confounded, further study is warranted to reveal whether children's understanding of effort and outcome play a different role in their fairness decisions when necessary rather than luxury resources are being distributed.

In addition, this study measured effort (whether one was hardworking or lazy) by a very simple depiction; one target worked at a finite task (watering flowers to grow) and one did not (refraining from watering plants to grow). Yet, there are many other ways in which effort can contribute to a task that merits resources, such as solving a problem, helping others

in need, and so forth. Particularly, the effort could be in the form of benefiting others (e.g., actively helping others or engaging in a fundraiser event) rather than maximizing self-gain or interest (e.g., working hard to achieve something on one's own, as in the current study). Similarly, outcome was operationalized by a finite tangible product: how many flowers a peer grew. Other ways to explore the outcome could include intangible products (making a group work better) or completing a task. The myriad ways in which effort and outcome could be analyzed as a contributing factor for resource allocation decisions could be explored.

To our knowledge, the current study was the first to attempt to understand how children think about effort and outcome respectively in their conceptions of fairness. Because our participants were limited to children who reside in the mid-Atlantic region of the United States, the next step would be to examine children from different cultural, racial, and ethnic backgrounds. This would help reveal whether our findings could be generalized to children across cultures, or whether there are some cultural differences in how children weigh effort and outcome in making meritorious decisions. In addition, taking the larger context into account, such as access to resources and disadvantaged status would be relevant for understanding effort and outcome variables in an allocation task (see Elenbaas & Killen, 2016). Another fruitful direction to follow up the study is to document peer factors of children who make the fairness judgments and examine if these relate to children's fairness decisions regarding merit. For example, it could be that independent variables such as one's academic achievement, effortful control, or the overall amount of effort the person puts into their school work may influence how children weigh effort and outcome. Whether a peer is a hardworking person herself or himself could relate to how much they value effort, and further how much they consider this as an important moral principle.

Conclusions

The current study made a significant contribution to the current literature by examining the process by which children integrate merit in their fairness decisions. In particular, this study sought to answer remaining questions regarding the unclear aspects of children's meritorious allocation decisions, such as how children weigh effort and outcome in considering merit. Findings from the current study revealed that children regard merit as a core moral principle for deviating from strict equality and that this is still true when outcome and effort are controlled. Further, with age, children increasingly prioritized effort over outcome, by focusing on the positive intentions of an act rather than positive consequences. This provided further insight into which aspect of merit is prioritized in children's conceptions of fairness and helped us better understand how children come to reach a moral decision that ensures fairness for everyone.

Table 1

Peer Characters, by Levels of Effort and Outcome

		Outcome	
		High	Low
Effort	High	High Effort, High Outcome (HH)	High Effort, Low Outcome (HL)
	Low	Low Effort, High Outcome (LH)	Low Effort, Low Outcome (LL)

Table 2

Comparison of Two Peers, by Story

Story	Peer 1	Peer 2
Story 1	HH (Hardworking, 10 flowers)	LL (Lazy, 2 flowers)
Story 2	HL (Hardworking, 2 flowers)	LL (Lazy, 2 flowers)
Story 3	LH (Lazy, 10 flowers)	LL (Lazy, 2 flowers)
Story 4	HL (Hardworking, 2 flowers)	LH (Lazy, 2 flowers)

Table 3
Means and Standard Deviations for Proportion of Justifications

Age Group	Merit based on Effort and Outcome		Merit base only on Effort		Merit base only on Outcome		Contrasted Merit Effort vs. Outcome	
	3-6 years	7-10 years	3-6 years	7-10 years	3-6 years	7-10 years	3-6 years	7-10 years
Emphasis on effort	.36	.30	.28	.64	.28	.64	.26	.62
Emphasis on outcome	.18	.06	.36	.12	.24	.20	.26	.08
Emphasis on both	.14	.58	.02	.24	.08	.10	.08	.18
Strict equality	.10	.02	.12	.00	.12	.02	.20	.08

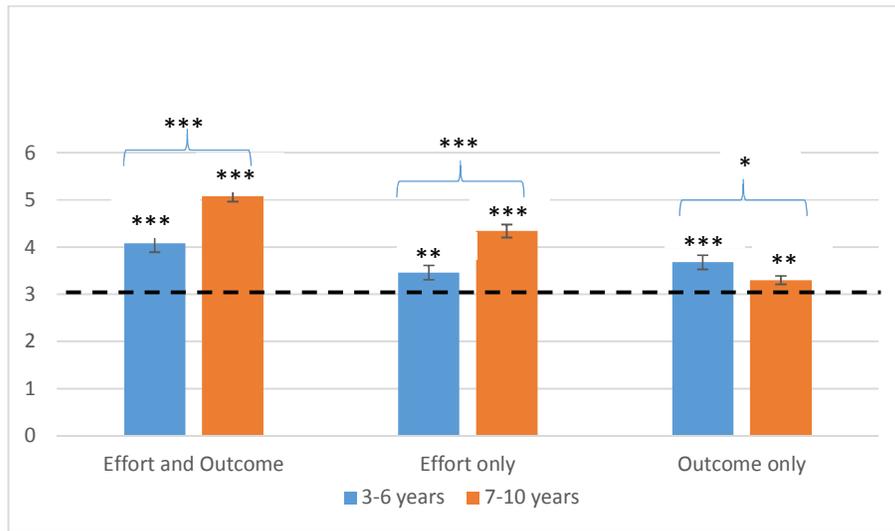


Figure 1. Number of resources allocated to the meritorious peer by age and merit context.

The total number of resources is 6. Asterisks indicate cases where children significantly allocated more resources to the meritorious peer. *** $p < .001$, ** $p < .01$, * $p < .05$

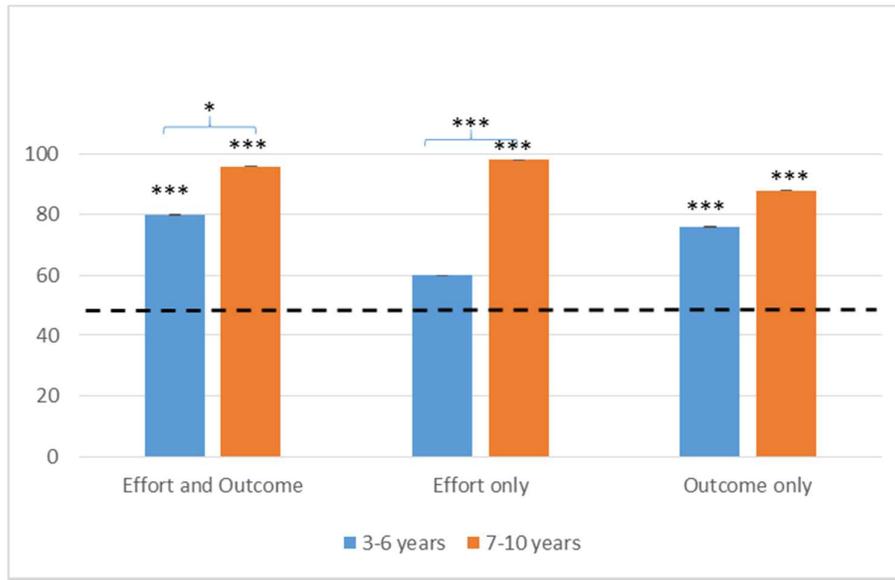


Figure 2. Percentage of participants who preferred to work with the meritorious peer.

Asterisks indicate cases where children significantly preferred the meritorious peer. *** $p < .001$, ** $p < .01$, * $p < .05$

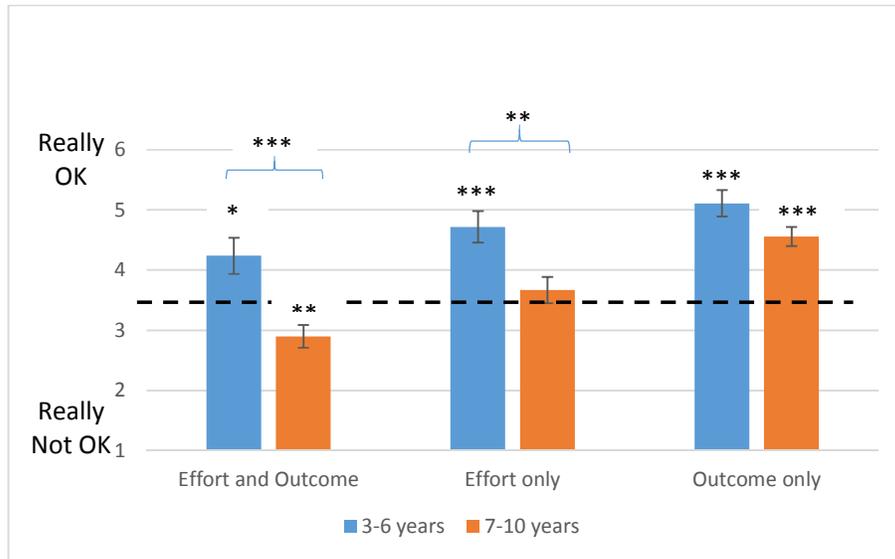


Figure 3. Children's evaluations of authority figure's equal allocation by age and merit context. The responses range from 1 – 6, representing “really not OK” to “really OK”.

Asterisks indicate cases where children significantly differed from the midpoint. *** $p < .001$, ** $p < .01$, * $p < .05$

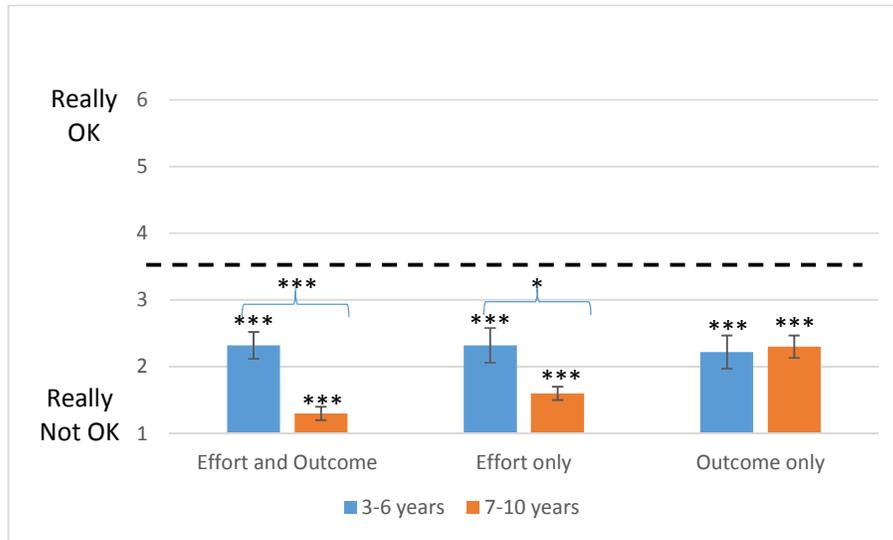


Figure 4. Children's evaluations of authority figure's allocation in opposition to merit by age and merit context. The responses range from 1 – 6, representing “really not OK” to “really OK”. Asterisks indicate cases where children significantly differed from the midpoint. *** $p < .001$, ** $p < .01$, * $p < .05$

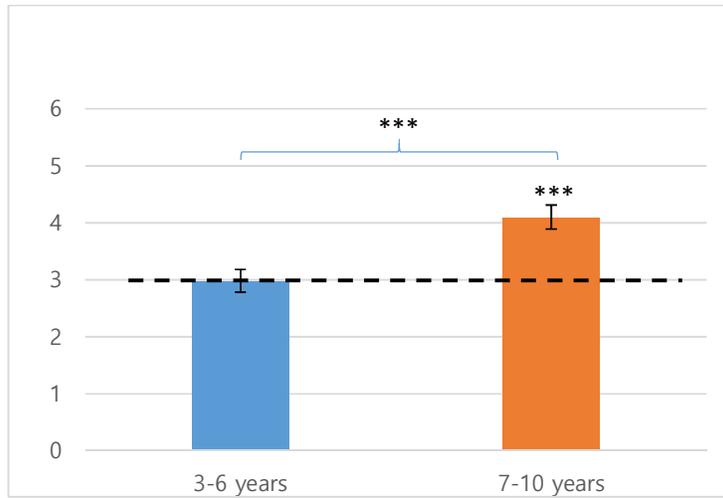


Figure 5. Number of resources allocated to the High Effort (and Low Outcome) peer over the Low Effort (and High Outcome) peer. The total number of resources is 6. Asterisks indicate cases where children significantly allocated more resources to the high effort peer over high outcome peer. *** $p < .001$, ** $p < .01$, * $p < .05$

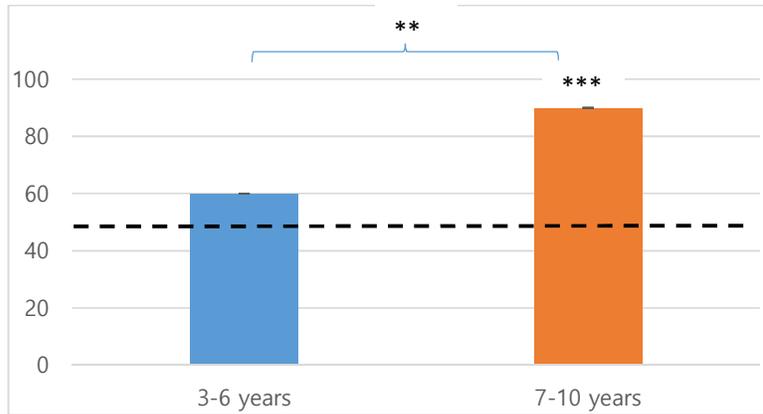


Figure 6. Percentage of participants who preferred to work with High Effort (and Low Outcome) peer over the Low Effort (and High Outcome) peer. Asterisks indicate cases where children significantly preferred the High Effort (and Low Outcome) peer. *** $p < .001$, ** $p < .01$, * $p < .05$

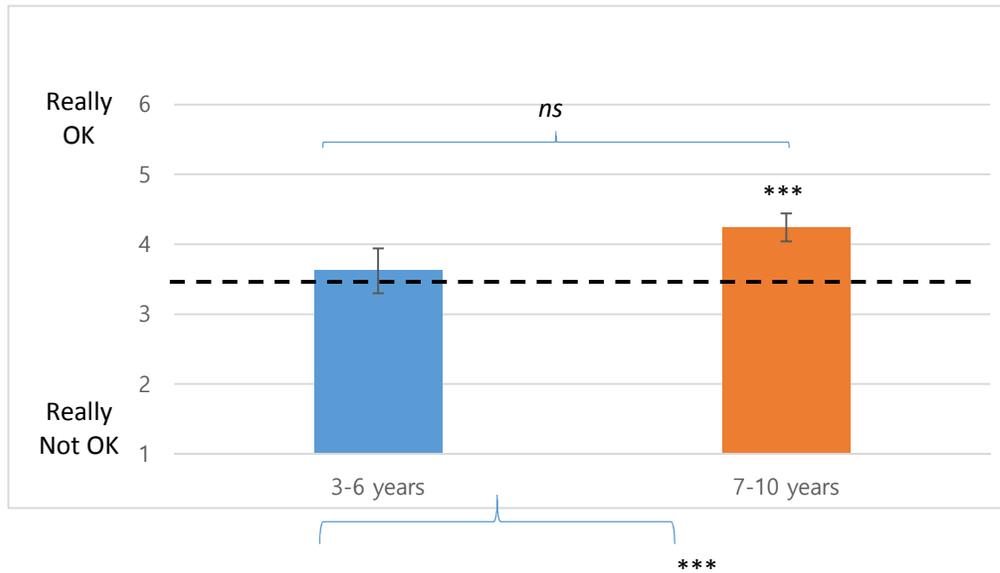


Figure 7. Children’s evaluations of authority figure’s allocation to the High Effort (and Low Outcome) peer over the Low Effort (and High Outcome) peer. The responses range from 1 – 6, representing “really not OK” to “really OK”. Asterisks indicate cases where children significantly differed from the midpoint. *** $p < .001$, ** $p < .01$, * $p < .05$

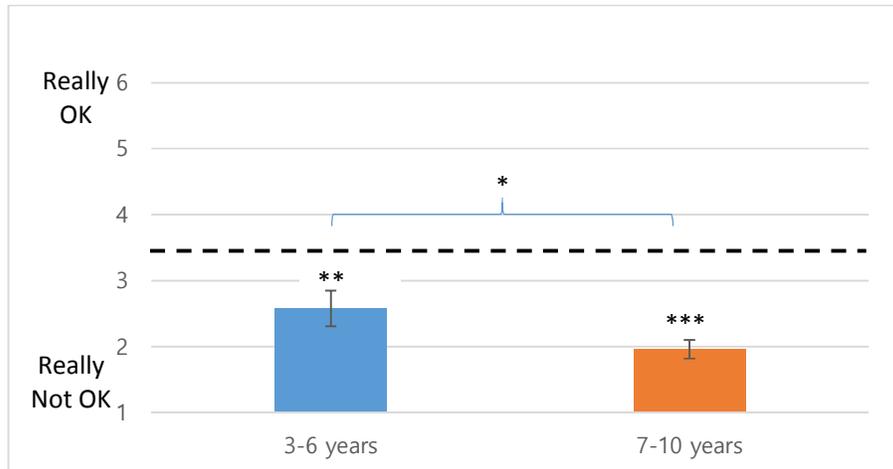


Figure 8. Children’s evaluations of authority figure’s allocation to the High Outcome (and Low Effort) peer over the Low Outcome (and High Effort) peer. The responses range from 1 – 6, representing “really not OK” to “really OK”. Asterisks indicate cases where children significantly differed from the midpoint. *** $p < .001$, ** $p < .01$, * $p < .05$



1204 Marie Mount Hall
College Park, MD 20742-5125
TEL 301.405.4212
FAX 301.314.1475
irb@umd.edu
www.umresearch.umd.edu/IRB

DATE: December 11, 2015

TO: Melanie Killen
FROM: University of Maryland College Park (UMCP) IRB

PROJECT TITLE: [826477-1] Children's Understanding of Effort and Outcome in Resource Allocation

REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: December 11, 2015
EXPIRATION DATE: December 10, 2016
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7

Thank you for your submission of New Project materials for this project. The University of Maryland College Park (UMCP) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

Prior to submission to the IRB Office, this project received scientific review from the departmental IRB Liaison.

This submission has received Expedited Review based on the applicable federal regulations.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of December 10, 2016.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Unless a consent waiver or alteration has been approved, Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others (UPIRSOs) and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Please note that all research records must be retained for a minimum of seven years after the completion of the project.

If you have any questions, please contact the IRB Office at 301-405-4212 or irb@umd.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Maryland College Park (UMCP) IRB's records.

University of Maryland College Park

Page 1 of 2

Initials: _____ Date: _____



UNIVERSITY OF
MARYLAND

Department of Human Development and Quantitative Methodology
3942 Campus Drive, Suite 3304
College Park, MD 20742-1131

Melanie Killen, Ph.D.
Office: 301.405.3176
Email: mkillen@umd.edu

Dear Parents or Guardians:

We are conducting a study on how children at different ages make decisions about sharing resources to better understand how children reason fairness. We would like to tell you about our project, and ask for your permission to interview your son or daughter for this new project.

The aim of the study is to investigate how children between the ages of 3- to 13-years-old weigh two important variables when considering how to allocate resources, effort (how hard one works) and outcome (the outcome of one's effort). We will be telling children short stories accompanied by brightly colored photos and animated illustrations of the story narrative. We will describe a situation where two peers are given flower seeds to grow plants. How hard a child worked to grow sunflowers and how many sunflowers a child eventually grew will be varied. We will ask children to judge who should receive stickers from the school and why.

There are no right or wrong answers. We are learning about children's decision-making regarding resource allocation and the variables that they use when reasoning about their judgments. Trained research assistants from the University of Maryland will conduct the interviews. The interview is a one-time administration and will take about 15 -20 minutes to complete. All interviews will be audio recorded and participation is strictly voluntary. All information is confidential.

Children who have participated with us in the past have found this interview to be a fun experience. **Please look over the description on the reverse side of this letter. If you are willing to have your child participate in the project, please fill out the information and return the form to the director.**

The information from our past research and our work with children and schools has helped teachers, policy makers, counselors and school administrators design curriculum and interventions to promote mutual respect among children and positive social environments for all children. This current research project has been approved by the Institutional Review Board at the University of Maryland. We thank you, in advance, for reading this letter, and for your willingness to allow your daughter/son to participate.

Sincerely,

A handwritten signature in cursive script that reads "Melanie Killen".

Melanie Killen, Ph.D.
Professor of Human Development and Quantitative Methodology

University of Maryland College Park



Project Title	Children's Understanding of Effort and Outcome in Resource Allocation
Purpose of the Study	This research is being conducted by Dr. Melanie Killen at the University of Maryland, College Park. We are inviting your child to participate in this research project because he/she is between the ages of 3- to 13-years-old. We are conducting this project to better understand how children reason fairness, particularly in regards to efforts and outcomes. We are also interested if interpretations of these judgments change with age and if their expectation on teachers' judgment are in line with their own judgments.
Procedures	Your child will be interviewed for 15 -20 minutes. Trained research assistants from the University of Maryland, College Park, will give the interviews and will be available to answer any questions. Interviews will be administered during school hours in a quiet, private room as identified by the school administrator (e.g., an available library classroom). Teachers will identify the best times for your child to be taken out of the classroom. This minimizes classroom disruption and ensures that your child is not missing important instruction. Interviews will be audio recorded. Your child will be told stories using brightly illustrated pictures and asked about 4 situations (e.g., if one child worked hard to grow sunflowers and if the other child did not work as hard to grow sunflowers, how should stickers be allocated?). Your child will be asked what they think the fair way to distribute rewards and why they made the judgment. There are no right or wrong answers. We are learning about children's interpretations of fairness with age and how children are reasoning the evaluations they make.
Potential Risks & Discomforts	There are no known risks to participating in this research project.
Potential Benefits	This research is not designed to help your child personally, but to help us learn about children's understanding of intentions and outcomes in resource allocation and their use of justifications and reasoning to make such decisions. This is a form of social knowledge, and will help us learn more about what think about a fair way to distribute valuable resources and how this might change with age. We hope that in the future, teachers, parents and childcare workers will be able to learn from this research and use it to help improve children's social experiences.
Confidentiality	We will do our best to keep your child's personal information private. Your child's name will not be attached to the interview. Your child will be given an ID number. We will not share your child's answers with anyone, including teachers, principal, or parents. When we write a report or article about this research project, your child's identity will be protected as much as possible. Audio recordings will be stored in password-protected file and destroyed after 5 years. Your child's information may be shared with representatives of the University of Maryland, College Park or governmental authorities if your child or someone else is in danger or if we are required to do so by law.
Medical Treatment	The University of Maryland does not provide any medical, hospitalization or other insurance for participants in this research study, nor will the University of Maryland provide any medical treatment or compensation for any injury sustained as a result of participation in this research study, except as required by law.
Right to Withdraw & Questions	Your child's participation is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify. Your decision to allow your child to participate in the study will have no positive or negative affect on your child's standing or grades within the school. If you decide to stop taking part in the study, if you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the investigator, Dr. Melanie Killen , a professor in the Department of Human Development and Quantitative Methodology at the University of Maryland, College Park. Dr. Melanie Killen Department of Human Development & Quantitative Methodology 3942 Campus Drive, Suite 3304, College Park, MD 20742-1131 (telephone) 301-405-3176 (email) mkillen@umd.edu
Participant Rights	If you have questions about your rights as a research participant or wish to report a research-related injury, please contact: University of Maryland College Park Institutional Review Board Office 1204 Marie Mount College Park, Maryland, 20742. E-mail: irb@umd.edu ; Telephone: 301-405-0678. This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.
Statement of Consent	Your signature indicates that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to allow your child to participate in this research study. You will receive a copy of this signed consent form. If you agree to allow your child to participate, please sign your name below.
Signature & Date	<u>CHILD'S NAME [Please Print]:</u>
	<u>PARENT'S NAME [Please Print]:</u>
	<u>PARENT'S SIGNATURE:</u>
	<u>DATE:</u>



V1 Female

 <p style="text-align: center;">Welcome!</p> <p>This survey was designed by a research group at the University of Maryland.</p> <p>We are interested in what children your age think.</p> <p>There are no right or wrong answers.</p> <p>This is not a test.</p> <p>If you have any questions, just let us know.</p>	PARTICIPANT, Please do not fill cut this section.	ENTRY STATUS
	Participant ID #	
	Transcribed	
	Coded	
	Likert Entered	
	Reasoning Entered	
	DD Likert Entered	
	DD Reasoning Entered	
Reliability checked (only if chosen)		

Please fill in the information below. If you have any questions, please raise your hand and ask!

Today's date: _____

Your initials (e.g., Mark Smith is MS): _____

Birthday: Please write the **month, day, and year** you were born (e.g., 07/12/1999):
_____/_____/_____-> **PLEASE DON'T FORGET TO INCLUDE THE YEAR!**

Your age in years (e.g., 10): _____

Gender (CIRCLE ONE): Male Female

SCHOOL NAME: _____

SCHOOL Teacher: _____

INTRODUCTION:

You are going to see pictures of some kids and read a little bit about them. Then you will answer some questions about these kids.

Let's start!

This is what the questions look like.

When you see this type of line on the form:

Really not OK	Not OK	A little bit not OK	A little bit OK	OK	Really OK
—	—	—	—	—	—

...this means that you will be asked to check the place that matches your answer to the question.

For example: If someone thinks that it is "really not okay" for Joe to take Sally's snack away, they would check:

Really not OK	Not OK	A little bit not OK	A little bit OK	OK	Really OK
<u>X</u>	—	—	—	—	—

If someone thinks that it is "okay" for Joe to give extra snack to Sally, they would check:

Really not OK	Not OK	A little bit not OK	A little bit OK	OK	Really OK
—	—	—	—	<u>X</u>	—

PRACTICE QUESTION 1

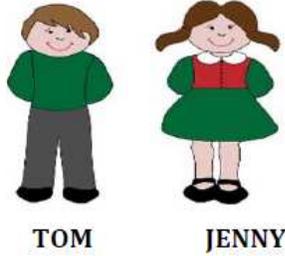
Question type 1: Let's say that John takes Kelly's toy away from her.

If someone thinks that is "Not ok", where would they check their answer?

Really not OK	Not OK	A little bit not OK	A little bit OK	OK	Really OK
—	—	—	—	—	—

Let's see a second type of question!

You will see a picture of two kids (such as Tom and Jenny).



And, you will also see a picture of these 6 stars.



A question would ask: "How many stars should Tom and Jenny each get?"
... this means that you will be asked to give out the 6 stars to Tom and Jenny.

If someone wants to give **4 stars to Tom** and **2 stars to Jenny**,
they would check below:



TOM JENNY (Check Below)

6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	<input checked="" type="checkbox"/>
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

PRACTICE QUESTION 2

Question type 2:

This is John and Kelly.

John and Kelly decide to share the toy and play with it together.

Now, here are 6 stars to give out!



If someone thinks John should get 5 stars and Kelly should get 1 star, where would they check their response?



JOHN



KELLY

(Check Below)

6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	_____
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

Now, Let's get started!

This is the first story.

This is Chris and this is Jordan. They are children your age.



CHRIS



JORDAN

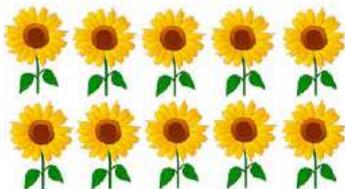
Their school gave everyone a package of sunflower seeds so that children can grow many sunflowers. Chris and Jordan each planted all of their sunflower seeds in a pot.

Chris *worked very hard* to grow sunflowers and *gave them water everyday*.
Jordan *did not work hard* to grow sunflowers and *did not give them any water*.



One month later..

Chris grew *10 sunflowers* and she *worked very hard* to water them.
Jordan grew *2 sunflowers* and she *did not work hard* to water them.



CHRIS



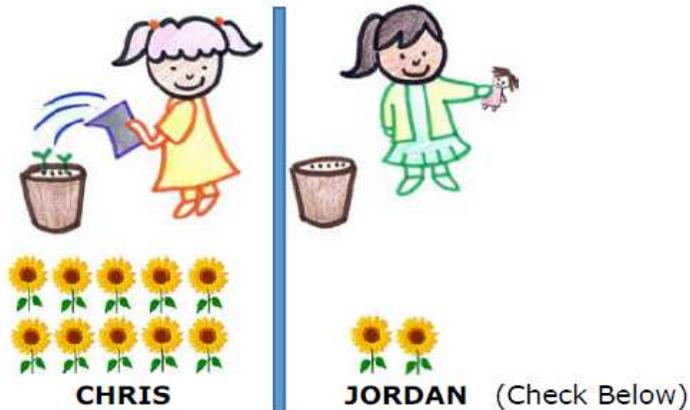
JORDAN

Here are 6 stars for you to give out!



1. Based on what you just read,
how many stars should Chris and Jordan each get?

Chris **worked hard** and grew **10 sunflowers**.
Jordan **did not work hard** and grew **2 sunflowers**.



6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	_____
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

2. Why did you give out stars like this? (Write your answers on the lines below.)

3. The teacher hears what happened.

The teacher knows that Chris worked hard and grew 10 sunflowers and Jordan did not work hard and grew 2 sunflowers. When the children are outside on the playground, the teacher will put stars in their bags. Here are 6 stars again:



Can you show me how many stars the teacher will give to Chris and Jordan?

TEACHER



Chris **worked hard** and grew **10 sunflowers**.
Jordan **did not work hard** and grew **2 sunflowers**.



(Check Below)

6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	_____
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

4. Why do you think the teacher will give out stars like this?

Chris **worked hard** and grew **10 sunflowers**.
 Jordan **did not work hard** and grew **2 sunflowers**.



5. Let's say one teacher says, "I'm going to give 5 stars to Chris and 1 star to Jordan because I always give more to the one who worked hard, and made more sunflowers." How OK or not OK is it for her to give more to Chris?



Really not OK Not OK A little bit not OK A little bit OK OK Really OK

6. Let's say another teacher says, "I'm going to give 3 stars to Chris and 3 stars to Jordan because I always give the same amount to everyone." How OK or not OK is it for her to give the same amount to Chris and Jordan?



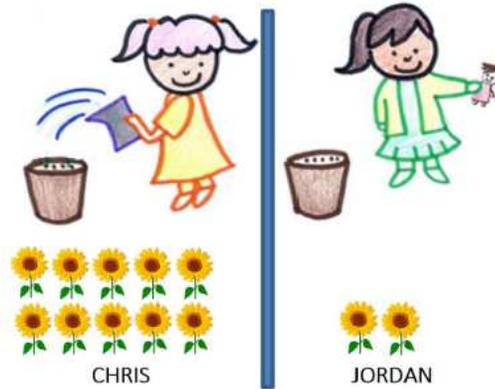
Really not OK Not OK A little bit not OK A little bit OK OK Really OK

7. Let's say another teacher says, "I'm going to give 1 star to Chris and 5 stars to Jordan because I always give more to the one who worked less, and made less sunflowers." How OK or not OK is it for her to give more to Jordan?



Really not OK Not OK A little bit not OK A little bit OK OK Really OK

Chris **worked hard** and grew **10 sunflowers**.
Jordan **did not work hard** and grew **2 sunflowers**.



8. Now remember, Chris worked hard and grew 10 sunflowers and Jordan did not work hard and grew 2 sunflowers. Let's say it is your turn to grow sunflowers and have a chance to get some extra stars!

You can ask one of these two children to grow flowers with you. Who would you want to grow flowers with, Chris or Jordan? (Please circle one).



Chris



Jordan

9. Why do you want to grow flowers with her?

This is the second story.

This is Sam and this is Alex. They are children your age.



SAM



ALEX

Their school gave everyone a package of sunflower seeds so that children can grow many sunflowers. Sam and Alex each planted all of their sunflower seeds in a pot.

Sam *worked very hard* to grow sunflowers and *give them water every day*.
Alex *did not work hard* to grow sunflowers and *did not give them any water*.



SAM



ALEX

One month later...

Sam grew *2 sunflowers* and she *worked very hard* to water them.
Alex grew *2 sunflowers* and she *did not work hard* to water them.



SAM



ALEX

Here are 6 stars for you to give out!



1. Based on what you just read, how many stars should Sam and Alex each get?

Sam **worked hard** and grew **2 sunflowers**.
Alex **did not work hard** and grew **2 sunflowers**.



SAM	ALEX (Check Below)
6 stars	0 star
5 stars	1 star
4 stars	2 stars
3 stars	3 stars
2 stars	4 stars
1 star	5 stars
0 star	6 stars

2. Why did you give out stars like this?

3. The teacher hears what happened.

The teacher knows that Sam worked hard and grew 2 sunflowers and Jordan did not work hard and grew 2 sunflowers. When the children are outside on the playground, the teacher will put stars in their bags. Here are 6 stars again:

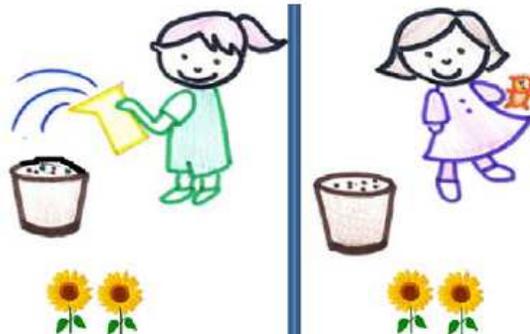


Can you show me how many stars the teacher will give to Sam and Alex?

TEACHER



Sam **worked hard** and grew **2 sunflowers**.
Alex **did not work hard** and grew **2 sunflowers**.



SAM

ALEX

(Check Below)

6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	_____
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

4. Why do you think the teacher will give out stars like this?

Sam **worked hard** and grew **2 sunflowers**.
Alex **did not work hard** and grew **2 sunflowers**.



5. Let's say one teacher says, "I'm going to give 5 stars to Sam and 1 star to Alex because I always give more to the one who worked very hard." How OK or not OK is it for her to give more to Sam?



Really not OK	Not OK	A little bit not OK	A little bit OK	OK	Really OK
_____	_____	_____	_____	_____	_____

6. Let's say another teacher says, "I'm going to give 3 stars to Sam and 3 stars to Alex because I always give the same amount to everyone." How OK or not OK is it for her to give the same amount to Sam and Alex?



Really not OK	Not OK	A little bit not OK	A little bit OK	OK	Really OK
_____	_____	_____	_____	_____	_____

7. Let's say another teacher says, "I'm going to give 1 star to Sam and 5 stars to Alex because I always give more to the one who did not work very hard." How OK or not OK is it for her to give more to Alex?



Really not OK	Not OK	A little bit not OK	A little bit OK	OK	Really OK
_____	_____	_____	_____	_____	_____

Sam **worked hard** and grew **2 sunflowers**.
Alex **did not work hard** and grew **2 sunflowers**.



8. Now remember, Sam worked hard and grew 2 sunflowers, and Alex did not work hard and grew 2 sunflowers. Let's say it is your turn to grow sunflowers and have a chance to get some extra stars!

You can ask one of these two children to grow sunflowers with you. Who would you want to grow sunflowers with, Sam or Alex? (Please circle one).



Sam



Alex

9. Why do you want to grow flowers with her? (Please write your answers on the lines below.)

Here are 6 stars for you to give out!



1. Based on what you just read, how many stars should Taylor and Dana each get?

Taylor **did not work hard** and grew **10 sunflowers**
Dana **did not work hard** and grew **2 sunflowers**



TAYLOR

DANA (Check Below)

6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	_____
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

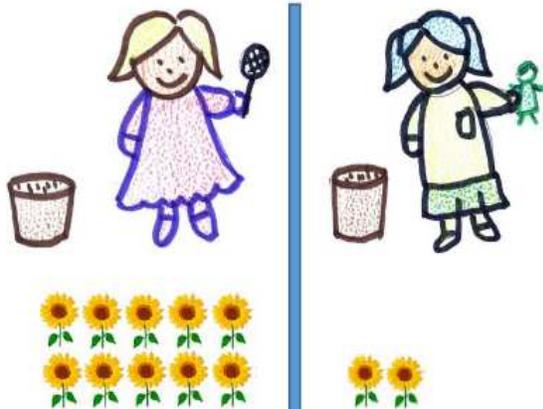
2. Why did you give out stars like this?

Here are 6 stars for you to give out!



1. Based on what you just read, how many stars should Taylor and Dana each get?

Taylor **did not work hard** and grew **10 sunflowers**
Dana **did not work hard** and grew **2 sunflowers**



TAYLOR

DANA (Check Below)

6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	_____
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

2. Why did you give out stars like this?

3. The teacher hears what happened.

The teacher knows that Taylor did not work hard and grew 10 sunflowers and Dana also did not work hard and grew 2 sunflowers. When the children are outside on the playground, the teacher will put stars in their bags. Here are 6 stars again:



Can you show me how many stars the teacher will give to Taylor and Dana?

TEACHER



Taylor **did not work hard** and grew **10 sunflowers**
Dana **did not work hard** and grew **2 sunflowers**



TAYLOR

DANA

(Check Below)

6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	_____
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

4. Why do you think the teacher will give out stars like this?



8. Now remember, Taylor did not work hard and grew 10 sunflowers and Dana did not work hard and grew 2 sunflowers. Let's say it is your turn to grow sunflowers and have a chance to get some extra stars!

You can ask one of these two children to grow sunflowers with you. Who would you want to grow flowers with, Taylor or Dana? (Please circle one).



Taylor



Dana

9. Why do you want to grow flowers with her?

Here is the last story. You are doing great!

This is Casey and this is Morgan. They are children your age.



CASEY



MORGAN

Their school gave everyone a package of sunflower seeds so that children can grow many sunflowers. Casey and Morgan each planted all of their seeds in a pot.

Casey *worked very hard* to grow sunflowers and *gave them water every day*.
Morgan *did not work hard* to grow sunflowers and *did not give them any water*.

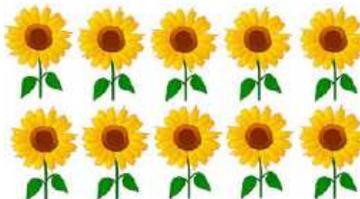


One month later..

Casey grew *2 sunflowers* and she *worked very hard* to water them.
Morgan grew *10 sunflowers* and she *did not work hard* to water them.



CASEY



MORGAN

Here are 6 stars for you to give out!



1. Based on what you just read,
how many stars should Casey and Morgan each get?

Casey **worked hard** and grew **2 sunflowers**.
Morgan **did not work hard** and grew **10 sunflowers**.



CASEY



MORGAN

(Check Below)

6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	_____
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

2. Why did you give out stars like this?

2a. Guess what, it turns out that there is one extra star here to give out!



Keeping in mind you already gave out 6 stars, who would you want to give the extra star? (Please circle one).



Casey



Morgan

2b. Why do you want to give the extra star to her?

(Go to the next page....)

3. The teacher hears what happened. But she only has 6 stars to give out. The teacher knows that Casey worked hard and grew 2 flowers and Morgan did not work hard and grew 10 flowers. When the children are outside on the playground, the teacher will put these stars in their bags. Here are 6 stars again:



Can you show me how many stars the teacher will give to Casey and Morgan?

TEACHER



Casey **worked hard** and grew **2 sunflowers**.
Morgan **did not work hard** and grew **10 sunflowers**.



CASEY



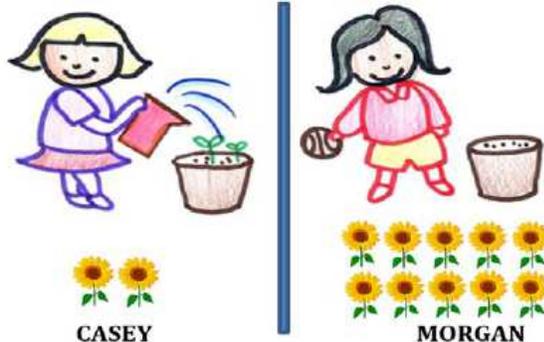
MORGAN

(Check Below)

6 stars	0 star	_____
5 stars	1 star	_____
4 stars	2 stars	_____
3 stars	3 stars	_____
2 stars	4 stars	_____
1 star	5 stars	_____
0 star	6 stars	_____

4. Why do you think the teacher will give out stars like this?

Casey **worked hard** and grew **2 sunflowers**.
Morgan **did not work hard** and grew **10 sunflowers**.



5. Let's say one teacher says, "I'm going to give 5 stars to Casey and 1 star to Morgan because I always give more to the one who worked hard, although she made less sunflowers." How OK or not OK is it for her to give more to Casey?



Really not OK Not OK A little bit not OK A little bit OK OK Really OK

6. Let's say another teacher says, "I'm going to give 3 stars to Casey and 3 stars to Morgan because I always give the same amount to everyone." How OK or not OK is it for her to give the same amount to Casey and Morgan?



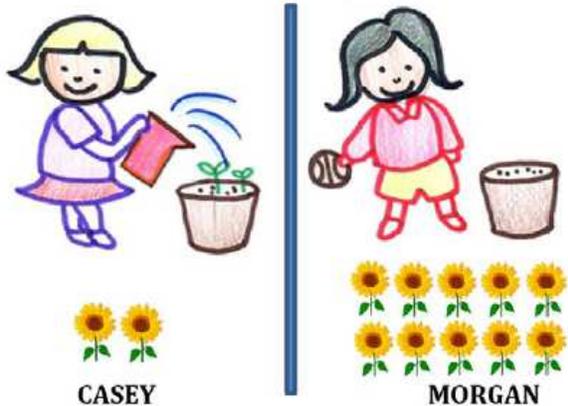
Really not OK Not OK A little bit not OK A little bit OK OK Really OK

7. Let's say another teacher says, "I'm going to give 1 star to Casey and 5 stars to Morgan because I always give more to the one who made more sunflowers, although she did not work hard." How OK or not OK is it for her to give more to Morgan?



Really not OK Not OK A little bit not OK A little bit OK OK Really OK

Casey **worked hard** and grew **2 sunflowers**.
Morgan **did not work hard** and grew **10 sunflowers**.



8. Now remember, Casey worked hard and grew 2 sunflowers and Morgan did not work hard and grew 10 sunflowers. Let's say it is your turn to grow sunflowers and have a chance to get some extra stars!

You can ask one of these two children to grow flowers with you. Who would you want to grow flowers with, Casey or Morgan? (Please circle one).



Casey



Morgan

9. Why do you want to grow sunflowers with her?

Great Job!
Thank you for your participation



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