Children's Developing Sharing Behaviors across Cultures

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Abstract

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As one of the critical behaviors that distinguish human beings from other species, sharing behaviors, however, remains the least studied subtype of prosocial behaviors. Studies have shown that sharing with others is challenging for young children since it usually comes with a personal cost, which requires certain developmental resources to solve the conflict between self-interest and "social good." Through a holistic examination of previous literature by visual patterns, I find that though the current field has widely explored how socio-contextual factors affect young children's sharing behaviors, their results are mixed, and most of their studied population only come from a western background. In this paper, I propose that a cross-cultural perspective could explain variances and provide insights into mechanisms of young children's developing sharing behaviors. By depicting developmental trajectories, presenting culturally-diverse patterns, and exploring sources of cultural differences, this paper suggests that, rather than the problem of sharing or not sharing, children across cultures differ in how much, under what circumstances, and what intrinsically motivates them to share. A multi-level system of factors that affect sharing, a culture positioning model, and strategies to increase children's sharing behaviors are also portrayed to support the argument.

Children's Developing Sharing Behaviors across Cultures.

Introduction

Growing up in a small town in East China, I was always taught by parents and teachers to think of others' needs and share what I have as generously as I can. While such fair sharing norms were embedded in my mind from a very young age, I can still remember how heartbroken I was as a young child to give up my favorite toys or food to others to meet adults' expectations. Later, when I was teaching in kindergartens, I always unconsciously told children in my class to share when met with conflicts about resource allocation during play, which seemed a natural way of resolving problems. I became the adult that reinforced our sharing norms with children and took sharing behaviors for granted. I wondered from when children feel less painful to share with others and from when they are fully assimilated to their social norms of sharing. Those contrasts made me wonder how children's sharing behaviors develop and how the culture they live in plays a part in shaping sharing.

As one of the subtypes of prosocial behaviors, scholars define sharing as giving up personal material possessions for the benefit of others, which sometimes is out of concern for fairness and equity norms and the needs of others (Eisenberg et al., 1984; Birch & Billman, 1986). Studies have documented the benefits of sharing behaviors for children, including increasing peer acceptance (Layous et al., 2012), building and maintaining positive peer relationships (Berndt, 2002), promoting social exchanges among peers (Laursen & Hartup, 2002), and potentially improving later academic achievements (Capara et al., 2000). As one of the key behaviors that distinguish human beings from other species (Knafo & Plomin, 2006), sharing behaviors are among the few prosocial behaviors that could show a true altruistic nature (i.e., intrinsically motivated to benefit others without expectations of external rewards) of people

when conducted privately (Carlo, 2006). However, compared to other forms of prosocial behaviors, sharing remains the least frequently studied subtype among young children (Ongley & Malti, 2014). This is probably because sharing behaviors do not occur as often as other prosocial behaviors, such as helping or cooperating in early childhood periods (Eisenberg, 2005), and they are challenging for children both mentally and cognitively. Sharing is often also costly for children as it involves giving up an object that they possess. In order to make a fair sharing, children have to recognize inequality between themselves and others, resolve the direct conflict of self-interest and the interest of others, and inhibit their impulses to keep more resources for themselves (Brownell et al., 2009; Paulus, 2014).

Visual Patterns of Previous Literature

To capture a general sense of what literature has studied young children's sharing behaviors, this paper adopted a scientifically validated tool named CiteSpace to visually see the patterns and trends of previous studies. This paper's literature database was imported from the Web of Science using the searching keywords of "Shar*behavio*(All Fields) and Child*(All Fields)," which not only targeted the interested population and behaviors but also could include all-encompassing research. My final literature database consisted of 3824 articles and books from 1960 to 2022, after manually excluding ones that are irrelevant to the theme of this paper (e.g., studies about the benefits of shared reading between the parent-child dyad are not our focus).

Key Topics

Picture 1 shows the key topics scholars talk about most frequently and their cluster networks among databases using the keyword and abstract analysis. The labeled dots are those that were mentioned in at least 50 papers. The bigger the dot, the more frequently the keyword is

mentioned in literature. To present the picture more clearly, I combined terms with similar or even the same meanings into one term. For example, we would integrate “prosocial skills” and “prosocial behaviors” into “prosocial development,” and combine phrases like “3-6-year-old children” and “children at early ages” into “young children” (see Picture 1).

Despite keywords such as “prosocial development,” “young children,” and “sharing behavior” that should be obviously prevalent among literature because of my topics of interest, we could notice three lines of popular themes in research about children’s sharing behaviors. First, through keywords including “moral development,” “empathy,” “fairness,” and “distributive justice,” lots of studies are interested in examining relationships between sharing behaviors and children’s motivational mechanisms. We may expect to see research talking about children’s moral reasoning about their decision of sharing behaviors. Although “cognition” was also mentioned among papers, we don’t see many of its subconcepts in this picture, probably indicating that the detailed process of how cognitive resources affect children’s sharing behaviors is not well understood yet. Second, studies have explored socio-contextual factors that may impact children’s sharing behaviors. Among them, “friendship,” “gender,” “age,” and “mother” were investigated widely. When we set the labeling threshold from 50 to 15, more factors emerged, such as “schooling experience,” “object,” “recipient,” etc. Third, from “resource allocation” and “dictator game”, we can see that many empirical studies adopted approaches from the economic game theory to measure children’s sharing since behavioral economics paradigms of sharing can show people’s concern for others even if it will make a cost to themselves (Fehr et al., 2008; Gummerun et al., 2008).

Taken together, keywords labeled in the visual pattern reveal that studies have already inquired into how self-motivation and socio-contextual factors impact children’s sharing

behavior. While motivation mechanisms and socio-contextual factors are fundamentally grounded in different social norms and cultural values, we don't see keywords about cultural influences in this picture, indicating a less-explored topic of research about young children's sharing behaviors. Moreover, there are no prominent studies in this field about children's sharing behaviors. Most of the topics researched are interconnected with each other but didn't form a systematic network. That may be one of the reasons why there is a gap in literature about children's sharing compared to other prosocial behaviors. In this paper, I would like to address this gap and connect literature through the lens of cultural influences.

Targeted Population

While culture is such a broad concept that contains every aspect of people's life, to conveniently and quickly identify and compare cultural differences, people usually use the country name to represent its culture. Thus, I documented countries of the research population in the literature to learn if current studies about children's sharing could show the diversity of cultures they represent. In this case, I set the labeling threshold as 1 to have a full picture of cultures of sharing behaviors that have been explored (see *Picture* 2). Similar to the previous picture, the size of the dot indicates the times it has been studied. However, this picture shows some clusters among different countries (the ones with the same color of linking lines and closely connected with each other), which means those countries are usually studied and compared together.

It's clear at first sight that US children are the most dominant researched population in literature, and this particular population is linked with the majority of studies that were conducted with children from other countries. In other words, we may speculate that a large quantity of previous literature about the development of children's sharing behaviors speaks

from a US cultural perspective. Other popular targeted populations include children from Germany, Canada, China, and England. When taking a closer look, we =see that while there were 33 countries listed in the picture, they almost all represent western cultures, with only a handful of eastern countries (e.g., China, Japan, Thailand, etc.) getting research attention. Those countries were typically considered to have distinct cultural backgrounds and values from the western world among research. Such disproportionate representations of cultures may be one of the reasons for the lack of diverse cultural perspectives in the current field. However, we should absolutely pay attention to the selection bias of the current literature database of this study since we only include English writing papers collected by Web of Science but lack the ability to code studies of other languages or from other databases.

Research Questions

The visual patterns suggest that previous research has widely investigated children's sharing behaviors in the context of motivational mechanisms or various factors. While such motivational or socio-contextual factors are closely linked or fundamentally affected by cultural values and practices, they didn't pay much attention to their deeper sources as we couldn't see the word "culture" or its synonyms presented on the key topics pattern even when we lowered the labeling threshold down to 30. In this study, I propose that diving into cultural impacts and cultural mechanisms in young children's sharing behavior could make the picture a complete one. Besides, previous studies are mainly focused on sharing behaviors of children from western countries, with only a small proportion of data from children of eastern societies presented. Through this review, I would like to address some eastern perspectives of young children's sharing behaviors to balance the currently biased field. Broadly speaking, the gaps in previous

literature inform us of the necessity of a systematic review of children's sharing behaviors from a diverse cultural perspective.

What the visual patterns cannot tell is about the research trends of literature and its detailed research purpose, methods, and results. After a closer examination of previous studies, I noticed three broad trends and their limitations. First, from discussing sharing as a broad concept and examining its evolutionary origins, increasing empirical studies began to segment sharing behaviors in smaller natural parts and examined them into different situations. For example, scholars have defined several subtypes of sharing behaviors, such as spontaneous, elicited, and passive sharing, and examined whether and how children's reactions to them will be the same or different (e.g., Rao & Stewart, 1999; Rochat et al., 2009; Paulus & Moore, 2014; Wu et al., 2018). Transitioning from the only perspective of children as the sharer, studies also probed into their behaviors as the recipient or as the third-party viewer (e.g., Paulus & Moore, 2014; Smith et al., 2013). Nevertheless, there hasn't been an integral review that includes and connects the fruitful results of those studies. To my knowledge, since previous literature reviews usually treat sharing behaviors as a subpart of their review about prosocial behaviors, it is necessary to form a review that solely focuses on children's developing sharing behaviors and dives into detailed elements during sharing.

Second, a growing number of cross-sectional studies have emerged and noticed the role of cultural dimensions, economic contexts, and the degree of urbanicity on children's sharing behaviors. However, the majority of them only touched the surface of the cultural influences as they only listed culture (usually represented by children's living countries) as one of the factors in their analysis rather than as a deep source of the differences that shape the quantity, frequency, and willingness of children to share with others. Additionally, until now, few longitudinal studies

have been conducted to trace the developmental trajectories of young children's sharing behaviors. The current field consists of many separate studies that focus on one certain age period, but we lack knowledge of how and why their sharing behaviors change or remain the same.

Third, while increasing research has presented several concordant conclusions to the field, such as children's natural emotional reward after sharing with others (Brownell, 2013; Aknin et al., 2018; Song et al., 2020), there are still a good number of conflicting results among studies that have adopted similar methods, including how gender (e.g., Birch & Billman, Asscheman et al., 2020) or parents' sharing patterns and nurturing styles (e.g., Stewart & McBride-Chang, 2000; Kartner et al., 2010) affect children's sharing behaviors. We certainly need to trace the deep cultural sources of those conflicts and then provide a plausible explanation. However, we should also recognize from the mixed results that sharing with others is a dynamic and complex social behavior for children.

Hence, the current study will extend previous literature and address the above gaps by addressing the following questions about children's developing sharing behaviors: How do children's sharing behaviors develop from infancy to middle childhood? What could account for their motivations to share equally with others and how do they generate complex sharing behaviors? To what degree are there patterns of cross-cultural sharing behaviors of children? Furthermore, how does culture exercise its effect on children's sharing?

In order to fully explore these questions, this paper will first examine how psychological developments provide foundations for children's fair sharing from both a motivational and cognitive perspective. Through holistically and systematically examining factors that may influence children's sharing behaviors, I then attempt to generate cross-cultural patterns that

capture developmental trajectories and their underlying cultural mechanisms. Cultural theories that could explain or trace the differences in patterns will also be discussed. In the end, I will propose strategies that might increase young children's sharing behaviors and identify the limitations and future directions in this field.

Psychological Foundations of Sharing Behaviors

Studies have clearly documented that there is a "knowledge-behavior gap" in children's sharing behavior. Children, from very early years of age, know that people (both themselves and others) should share with others and expect equal resource allocation during sharing (Smith et al., 2013; Blake et al., 2014). By at least 15 months of age, they can quickly identify whether or not other people violated the equal sharing norms (Olson & Spelke, 2008; Geraci & Surian, 2011; Schmidt & Sommerville, 2011; Chernyak et al., 2019). However, when they are given chances to share their things with others, most of them fail to do a fair sharing in many situations (Fehr et al., 2008; Paulus & Moore, 2014). Among literature, scholars have proposed two major reasons to explain such a gap—insufficient motivation and insufficient cognitive resources, though they have also admitted that the underlying processes are still not well understood yet (Ongley & Malti, 2014; Smith et al., 2013; Chernyak et al., 2019). Typically, factors such as fairness concerns and empathy are common in motivational studies of sharing behaviors, while accounts of theory of mind, executive functions, and claim of ownership are examined to provide evidence for cognitive mechanisms.

Motivational Mechanisms

When distributing resources between two third parties, preschoolers are found to be capable of making an equal allocation (Peterson et al., 1975; Rochat et al., 2009; Baumard et al., 2012), probably because their own motivation and interest are not at stake (Chernyak & Sobel,

2016). Therefore, some scholars assume that children's failure of equal sharing when it would cost resources of themselves might result from selfish motivations, including a desire to keep advantages over others (Sheskin et al., 2016) and a lack of interest to please or comfort others (e.g., the recipient and/or the observer) (Moore, 2009). However, other researchers have suggested that we should not presuppose the selfish nature of children because growing evidence regarding fairness concerns and empathy ability of children found that they understand and wish to share equally with others before they can actually implement those desires (Smith et al., 2013; Chernyak & Sobel, 2016).

Fairness Norms

Miller (2006) suggests that fairness reasoning is a universal ability across cultures. However, like care and consideration for others, the sense of fairness is not given; it develops through children's socialization processes (Eisenberg & Mussen, 1989; Fehr & Fischbacher, 2004; Rakoczy & Schmidt, 2012). While in later infancy, children have begun to appreciate fairness norms, the mechanism hasn't yet been completely figured out (Schmidt & Sommerville, 2011). One hypothesis is that it develops through imitative learning from caregivers (Lancy, 2014). Theorists have also hypothesized that children's experience in daycare centers may be an essential resource for them to learn and act according to the social norms (Paulus & Moore, 2014).

Generally speaking, the process of making sharing behaviors consistent with children's sense of fairness happens as children learn to compromise their own desires with the social norms and others' feelings, and control their behaviors accordingly. Smith et al. (2013) proposed three stages of fairness reasoning development: 1) self-centered and self-interested reasoning, 2) belief in strict equality, and 3) merit- and need-based resource allocation strategy. In their study,

children aged 3-to-8 years old, from various socioeconomic backgrounds in the US, were shown to have already endorsed the fairness norms. However, their actual behaviors during sharing were not necessarily in line with their thinking. Typically, preschoolers would explain their actual sharing through the lens of their own desires and, surprisingly, would predict that they wouldn't be able to do a fair split even though they understood that they should share equally. In contrast, 7-to-8-year-olds shared not only fairly but also frequently referred to norms, their moral reputations, and others' feelings when justifying their behaviors. Fehr et al.'s (2008) study also uncovered another finding—children's aversion to sharing that violates fairness norms is limited to members of their own social groups, which they concluded as "parochialism."

Blake et al. (2015) dived deeper into this inequality aversion phenomenon, which they considered an indispensable component of children's sense of fairness. While they didn't pay much attention to the "in-group favoritism" factor, their cross-culture study (including populations from Canada, India, Mexico, Peru, Senegal, Uganda, and the US) found that 4- to 15-year-old children from all listed societies have a disadvantageous inequality aversion (DI—receiving less than peers) while only teenage-year children from the US, Canada, and Uganda show an advantageous inequality aversion (AI—receiving more than peers). However, Paulus's (2015) study didn't find such an AI effect for children from low socioeconomic backgrounds in the Ugandan sample. Taken together, the process of how fairness manifests its impact on children's sharing behaviors is not a simple linear model that only related to age but a more dynamic and complex one that must incorporate other cultural and contextual factors (e.g., schooling experience, parenting style, relationship to the recipients) into the analysis.

Empathy

While infants lack the ability to tell others' feelings from their own, they have already exhibited empathy (e.g., distress and concerns) when observing unhappy feelings of others (Hoffman, 1977). When they reach two years old, they begin to separate their own reactions from others' distress feelings; with increasing age, they also attempt to ease others' concerns through various actions, including allocating more resources during sharing scenarios to others than they originally planned (Williams et al., 2014).

Hoffman (2001) contended that empathy, as an important moral emotion indicator, is one of the antecedents of prosocial behaviors. A number of cross-sectional studies have revealed that empathic distress and concern are crucial predictors for sharing behaviors in early childhood (Li et al., 2013; Williams et al., 2014). Scholars have also detected that empathy is another important justification for fair sharing in later years of early childhood (Eisenberg, Eggum, & Di Giunta, 2010; Eisenberg, Spinrad, & Sadovsky, 2006). Research that traces the developmental trajectory of the effect of empathy on sharing behaviors is limited. But two factors are prominent in studies that evoke or make up for children's empathy during sharing activities. First, children are found to be more likely to share fairly when the recipient exhibits or even verbalizes that they feel depressed due to a lack of resources (Rheingold et al., 1976; Ongley & Malti, 2014). Second, negatively valenced moral emotions (NVME), including feeling guilty, bad, or sad, after the failure of doing other closely related prosocial behaviors, would compensate for children's low levels of empathy. That is to say, when children's empathy level is low, higher NVME level could predict higher levels of sharing both in its frequency and quantity. (Malti et al., 2016; Ongley & Malti, 2014). While empathy is such an early-emerged and vital ability for children to share, questions remain as to how empathy intertwines with self-desire and why self-desire would "defeat" empathy in most cases during children's early years.

Cognitive Resources

Contrary to theories that center on sufficient motivation (e.g., knowledge of fairness, engagement in empathy) as the most significant reason for children's active and fair sharing, some studies proposed that cognitive underpinnings are the prerequisite for the manifestation of their motivational abilities, and limitations of such resources restrict children in observing social norms and sharing resources with others (Laible & Karahuta, 2014; Chernyak et al., 2017). Moreover, unlike early knowledge of fairness norms and empathy, equal and active sharing demands the overall coordination of some highly developed cognitive processes and abilities that young children are not capable of yet. A growing body of research has identified that children's sharing behaviors are associated with several socio-cognitive capacities that grow robustly during early years of life, including theory of mind (Moore & Macgillivray, 2004; Takagishi et al., 2010; Cowell et al., 2015), executive function (Zelazo & Carlson, 2012; Blake et al., 2015; Cowell et al., 2016), and claim of ownership (Friedman & Neary, 2008; Brownell et al., 2013).

Theory of Mind

Piaget's (1965) theory of children's stage development may shed light on children's engagement in theory of mind (ToM) as they have to transit from centration (preoperational thinking) to decentration (operational thought), indicating their move from an egocentric cognitive style to a more considerate and thoughtful stage. In this century, scholars explored a more detailed sequence of steps for children to gain a comprehensive ToM. For example, Wellman & Liu (2004) concluded that ToM ability doesn't just suddenly present at four years of age. To fully engage in ToM, children have to first understand that people would have diverse desires and beliefs about the same thing, then acknowledge that others may not have the same

information as them, grasp false belief ability, and finally realize that they can deliberately hide their emotions.

As such, ToM is defined as the ability of perspective-taking in this context. Some scholars assume that with the development of ToM, children could be more concerned with people's emotions, desires, and welfare, thus exhibiting more prosocial behaviors (Caputi et al., 2012; Farrant et al., 2012). Nevertheless, the role of ToM on children's development of sharing behaviors has been debated for a long time.

Dating back to 1978, Iannotti believed that role-taking experience and ability (i.e., ToM) would enable children to share generously. However, later, Baron-Cohen et al.'s (1985) study showed no relationship between ToM and children's sharing behaviors, though they found it was less likely for children with impaired ToM ability to reject an unfair resource distribution. Among studies of this century, the disagreement lies in whether the first- or second-order false belief within the ToM domain is a strong indicator of fair sharing, with a trend towards the second-order false belief being a more reliable predictor. Takagish et al. (2010) found first-order false belief ability would enhance 5-year-olds' fair resources distribution. By contrast, Rochat et al. (2009) didn't detect such a significant relationship for 3- and 5-year-olds. Sally and Hill (2006) found that it was second-order false belief understanding that made children perform fair sharing among 6-10 years olds. Yu et al. (2016) provided more evidence that, for a Chinese 3-10 year old sample, children who succeeded in the second-order false belief tasks were five times more likely to do an equal sharing with out-group members but not in-group recipients. Cowell et al.'s (2017) cross-culture studies among Canada, China, Turkey, South Africa, and the US further indicated that independent of age, gender, and culture, second-order false belief ability

was strongly related to sharing while first-order false belief understanding couldn't predict fair and active sharing.

Executive Function

Zelazo and Carlson (2012) contended that the pattern of executive function (EF) development parallels the growth of the prefrontal cortex, which is vital to performing complex behaviors. While researchers still argue about whether EF emerges in late infancy, they agree that EF skills rapidly develop in early childhood, continue into teenage years, and develop well into early adulthood. Some scholars have proposed that improvement in working memory, cognitive flexibility, and inhibitory control would make children share more generously (Cowell et al., 2016). A very recent study even found an opposite direction of effect that prosocial behaviors, including sharing resources with others would enhance children's executive function (Moriguchi et al., 2020).

To my knowledge, there are few studies that directly examine how the three main areas of EF respectively contribute to children's sharing behaviors or vice versa, especially for working memory and cognitive flexibility. Regarding the relationship between inhibitory control function and sharing behaviors, a few research studies show mixed results. Aguilar-Pardo and colleagues (2013) reported that kindergarteners who shared fairly and generously had a better score in inhibitory control tasks than those who were not "altruistic enough." Thus, they put forward the theory that inhibitory control could undermine children's natural tendency to be self-maximized. Similar results have been shown in Paulus et al.'s study (2015). Nonetheless, Smith et al.'s (2013) research presented that inhibitory control is not linked with children's fair sharing and couldn't explain the gap between what children think they need to share and what they

shared. Therefore, more research is required to explore and understand how three measures of EF play a role in sharing.

Claim of Ownership

In general, scholars think that claim of ownership is a necessary ability for children to relinquish their possessions (Tobin et al., 1989), which is also a sign for children to grasp social power, especially the feeling of controlling the environment during the process of observation and negotiation within sharing. Faigenbaum (2005) found that as early as nine months old, infants have already shown possession of things and gradually develop a sense of property as they grow up. By two years old, they could explicitly claim property over objects and make a clear statement that the object belongs to themselves and not anybody else (Tomasello, 1998). When they reached age three, they could even attach values to things and recognize things they like or possess are exclusive to them, causing frequent arguments and conflicts with peers (Dunn, 1988). Studies have found that the claim of ownership ability is positively related to sharing in toddler years (Brownell et al., 2013) but negatively related to generosity when they enter preschool ages (Eisenberg et al., 1979; Friedman & Neary, 2008). However, we fail to find how understanding of ownership affects sharing among older children, probably because it is a very basic ability for younger children, but with the age increase, other more dominant factors with higher socio-cognitive demands come into place.

Beyond the above listed cognitive factors, a recent study uncovered that numerical cognition influences equal sharing for preschool- and kindergarten-aged children (Chernyak et al., 2019). They propose that limitation in knowledge of cardinal principles would constrain children's ability to share equally in dictator games but not their engagement in fairness norms. While such a finding hasn't been echoed in other studies from different cultures or contexts, its

logic aligns with other studies that speak to the effect of cognitive mechanisms—children are aware and motivated to make a fair sharing; however, it is their under-developing cognitive abilities that keep them from following the norms. More research is needed to explore how other kinds of knowledge, such as vocabulary, are related to equal sharing.

Putting the two aspects of psychological measures together, we may conclude that the tension between self-desire or self-interest and awareness of the necessity to adhere to social norms make equal sharing a complex behavior for children. We could also notice that the development of different psychological accounts may have opposite effects on promoting equality in sharing. For example, ownership understanding has a negative effect on preschoolers' equal sharing while their developing theory of mind ability, fairness sense, and feeling of empathy promote generosity. However, questions including what the most dominant factor is in different developmental stages, how various psychological factors intertwine with each other, and how they make a combined effect on children's display of sharing are still underexplored. This adds to the mystery of the mechanism behind the developmental trajectory of children's sharing behavior described in later part of this article.

Additionally, unless otherwise stated, most studies and theories examined above are generated by western scholars and based on western populations. Although some cross-cultural studies show similar effects of those psychological factors on different populations, we should still be aware of the differences in when, how, and to what degree they affect children's sharing.

Cross-cultural Development of Sharing Behaviors

While the previous part shows that motivation mechanisms and cognitive development are critical foundations for children to share, such universal psychological abilities fail to explain

and predict variances in children's sharing behavior across cultures for two reasons. First, the process of moral reasoning and the sense of fairness in motivation mechanisms are grounded in different cultural values (Trommsdorff et al., 2007), making children's sharing behaviors a cultural practice rather than natural abilities. Second, it's almost impossible to generalize a single global pattern of children's sharing behaviors because cultural and social contextual factors deeply affect the quantity, frequency, and willingness of sharing in spite of shared psychological mechanisms. Research has documented cross-cultural differences in children's sharing behaviors through examining varieties of detailed contextual factors. However, we still know little about what cross-culture patterns in sharing behaviors look like (e.g., patterns of how culture orientations or social-contextual factors affect sharing) and how cultural-related factors exercise their effects on children's developing sharing behaviors.

Positioning Culture Perspectives

When we try to capture the multifarious complexity of children's sharing behavior through the lens of culture, it's necessary to first "position" the role of culture correctly and notice how other perspectives also contribute to the unique and universal patterns of sharing behavior across groups before we dive deep into culture theories. Therefore, I propose a model that combines biological, developmental, and cultural approaches to explain how nature and nurture interplay to make similarities and diversities of sharing behaviors stated above.

Specifically, biological psychology supposes the emergence of adaptive behaviors (e.g., sharing from kinship and reciprocity to members outside of the group) as the result of the interaction between genetic dispositions and environmental conditions (Chasiotis, 2011). Developmental approaches answer questions about how behaviors are expressed in certain ways through the growth of age (e.g., how motivational and cognitive mechanisms play a role in

children's development of sharing at different ages) (Biorklund & Hernández Blasi, 2005). Constructing on them, I propose that cross-cultural theories and approaches explain how behaviors are shaped, not elicited, through social and cultural learning (e.g., the impacts of broad cultural dimensions and detailed socio-contextual factors).

In other words, biological and developmental psychology could answer that children have to possess some schemes (i.e., motivational and cognitive foundations) in their minds to exhibit fair sharing behaviors. However, such perspectives cannot account for the variances of children's developing sharing behaviors under different social contexts. It is the culture that decides how much, how fair, and how willing children are to share with others throughout their process of socialization into the world.

Cross-cultural Patterns

In 1976, Whiting highlighted the necessity for social and behavioral studies to look closely into children's learning environments rather than just conclude discrepancies into superficial cultural group differences. Details within children's learning and social contexts could provide deeper insights into children's behaviors. Under such spirits, Birch and Billman's (1986) influential study on preschoolers' food sharing with friends and acquaintances set the tone for the majority of later studies. They point out an almost complete set of social factors that impact children's sharing behaviors, including the sharer's gender, previous experience as a recipient, relative acquaintance with the recipient, and the recipient's behavior. Based on their research, scholars have segmented those factors into more detailed contexts, tried to make connections between them, and explored their combined effects on children's sharing behaviors. For example, in terms of children's closeness with the recipient, studies have explored situations

including when the recipient is anonymous or public (Stewart & McBride-Chang, 2000), liked or disliked by the sharer (Paulus & Moore, 2014), and gender differences when confronted with different recipient situations (Fehr et al., 2008; Gummerum et al., 2008; Asscheman et al., 2020). Beyond factors inspired by Birch and Billman (1986), researchers have also probed into the impact of parenting style (Brownell et al., 2013), the types of sharing (i.e., costly or non-costly; spontaneous sharing, elicited sharing, or passive sharing) (Paulus & Moore, 2014; Song et al., 2020; Rao & Stewart, 1999), the characteristics of the sharer (e.g., acceptance among peers)(Song et al., 2020), and the object to be shared (e.g., degree of importance or desirability of the items, the way children gained the object) (Balcı et al., 2021; Ulber et al., 2016) on children's sharing behaviors. A few studies also speak to broader cultural dimensions (i.e., collectivism vs. individualism; power distance) and attribute distinct manifestations of children's sharing behaviors to them (e.g., Rao & Stewart, 1999; Rochat et al., 2009; French et al., 2011).

While studies generate fruitful results that help us know more about why and how children share, they also add complexity to detect clues of cross-cultural patterns since factors seem to lie in different aspects and intertwine with each other. Thus, this paper puts forward a system that consists of different layers of factors to analyze cross-cultural patterns (see *Figure 1*), aiming to provide a clear view of the magnitude of diverse factors. There are three levels in this system, concluded as level 1, level 2, and level 3, respectively. Level 1 speaks from psychological foundations discussed in the previous part; level 2 contains social-contextual factors such as parenting style, gender, the recipient's characteristics, etc.; and level 3 examines abstract cultural dimensions. The increase in levels (level 1 to level 2; level 2 to level 3) means the factor has less direct effects but more cultural function on sharing behaviors. However, this

system cannot capture the developmental changes of sharing. Thus, when examining children's sharing behaviors, we should also consider developmental trajectories that are affected by the combined effects of these factors. With such scope, this paper discusses similarities and diversities in cross-cultural patterns.

Similarities

Among studies across different populations, there are some universal characteristics of children's sharing behavior. Callaghan and Corbit (2018) stated that "humans are biologically predisposed towards prosociality, and social factors shape its development once it emerges" (p. 102). Since children are believed to have an innate nature of altruistic sharing, and the mechanism of some social factors are alike across cultures, we could find similar patterns through the lenses of the developmental trajectories and different level 2 social-contextual factors.

Developmental trajectories

Across most cultures, young children have an altruistic and natural tendency to share. Among experts who studied prosocial behaviors throughout their careers, there is a joint agreement that prosocial behaviors and emotions are an innate capacity of human beings (e.g., MacDonald, 1984; Hoffman, 2007; Wynn, 2009), no matter whether they believe that the prosocial development of very young children (i.e., infants) has already been affected by the socialization of culture or not (Dunfield et al., 2011; Brownell et al., 2013). Ongley and Malti (2014) point out that, among all prosocial behaviors, sharing is especially "an exemplar of children's altruistic intentions." Ulber et al.'s (2016) study provides evidence to this notion as they found that young children have a unique and natural aversion to the inequitable allocation of resources in sharing. Nevertheless, chimpanzees show no sense of such fairness towards sharing,

only maximizing their own gains. Plotner et al.'s (2021) study also shows an intrinsic inclination of generous sharing among young children through their finding that young children significantly share more with peers under the time pressure condition (i.e., limited time for consideration) than in the delay condition. While theories such as kin selection (Hamilton, 1964) and reciprocal altruism (Trivers, 1971) from the last century suggest that children expect long term rewards that sharing may bring, a growing body of research shows a different phenomenon—they suggest that irrespective of any incentives, rewards, or encouragement, young children's sharing behavior itself would bring them happiness (Brownell, 2013; Aknin et al., 2018). A recent study conducted among Dutch and Chinese toddlers and preschoolers further endorsed such theory as they found sharing behaviors could give children emotional rewards even when they didn't receive positive feedback for their behaviors from adults (Song et al., 2020).

Most studies suggest that young children's sharing development is at similar levels under non-costly or low-costly situations. While human beings have a biological propensity towards sharing with others, children exhibit different levels of sharing behaviors as they grow up and socialize into the world. However, when sharing is at non- or low-cost levels (i.e., does not significantly involve the loss of a material possession), children across societies share a steadily increasing development of their sharing behaviors. Thompson et al. (1997) and Fehr et al. (2008) found that children aged 3 to 8 years old are more likely to make an equitable distribution of resources when there is almost no cost to themselves in Swiss and Canadian samples respectively. Furthermore, House et al. 's (2013) study documented the increasing trend of willingness, frequency, and quantity of objects of sharing behaviors among 3-14-year-olds in non- or low-costly situations across six distinct societies of Americas, Oceania, and Africa.

However, when sharing is costly, they detected a dropping sharing rate among all children as they approached middle childhood.

Children's costly sharing behaviors reveal a V-shaped trajectory independent of culture, economic contexts, and the scale of the society. Typically, studies show a high frequency of sharing from infancy to toddlerhood (Hay et al., 1991; Brownell, 2013), diminishing through 3-6 years old (e.g., Birch & Billman, 1986; Paulus & Moore, 2014; Robbins et al., 2016), and increasing again when children approached middle childhood (e.g., Fehr et al., 2008; Rochat et al., 2009; Ongley & Malti, 2014). A plot of change in sharing generosity (i.e., the combined effects of frequency, quantity, and willingness of sharing) with age is illustrated in *Figure 2*. While this plot could represent a general developmental trend of children's sharing behaviors across studies, we shouldn't regard it as an accurate trajectory for all children and emphasize a lot on its details since most of the studies' targeted populations are from western countries and their research methods and experiment contexts are varied from one another.

Sharing behaviors blossom when children reach toddlerhood. A large body of research has confirmed that as early as 8 months old, children begin spontaneously sharing food and toys with parents (Hay, 1979; Hay & Murray, 1982); and during toddler years, children actively engage in voluntarily sharing not only with their parents but also with peers (Rheingold 1973; Hay et al., 1991; Brownell et al., 2009). Brownell (2013) concluded that children's sharing behaviors bloom during toddlerhood in the frequency and quantity of objects to share. However, when they enter early childhood, their sharing behaviors are not as frequent in every situation as when they were toddlers. Birch and Billman (1986) directly point out that preschoolers are

particularly ungenerous sharers as they only give one piece of food to peers while reserving ten pieces for themselves.

3-to-5-year-olds are likely to optimize their own gains but begin to distribute equally around middle childhood. A study conducted in seven highly distinct places around the world (China, Peru, Fiji, United States, and three distinct sites in Brazil) found that children at about three years of age exhibit especially unequal distributions of their resources during the dictator game even though they are already capable of perspective-taking. It is not until they approach 7 to 8 years old that they are able to show more fairness during sharing since they start to adhere to the social norms of the society they live in and are further socialized to the culture at this age (Rochat et al., 2009). Even in "a compassion-based society (Tibetan Buddhist)", 3-5-year-old children from a monastic school who are intensively immersed in an environment that values "heightened generosity" are still prone to maximize resources for themselves in sharing (Robbins et al., 2016). One exception is that when the objects that children share are gained for free (i.e., windfall) or through collaborative activities, even 3-year-olds would share more equitably (Benenson et al., 2007; Fehr et al., 2008; Hamann et al., 2011). Researchers have not reached a consensus on whether sharing behaviors decrease, remain unchanged, or increase beyond age nine (Leman et al., 2009; Ongley & Malti, 2014; Malti et al., 2016).

Level 2: Social-contextual factors

Characteristics of the recipients: relative acquaintance. A lot of cross-sectional studies have found that 4–6-year-old children would share more with friends than strangers or disliked peers (Rao & Stewart, 1999; Moore, 2009; Paulus & Moore, 2014; Asscheman et al., 2020), though sharing with anonymous peers exhibit mixed results. However, as they grow up, such preference tends to be weakened as research has shown that elementary school students didn't

share a differentiated amount of items with friends or disliked ones. Therefore, we may conclude that, during preschool years, the relationship between the sharer and the recipient is an important factor related to children's sharing; as the age increases, children begin to share equally with different people even if they have a different sequence of relative acquaintance to them.

The object: earned by windfall or hard work. The value of the item to be shared is also an important indicator of how much children share with others. Some believe children's desirability of the item matters. Particularly, when the item is earned by hard work rather than received for free, children across all cultures and ages share significantly less with others (Rochat et al., 2009; Warneken et al., 2011; Ulber et al, 2016; Balcı et al. 2021). However, we should notice that most of these studies have focused on populations from western countries like Germany and the US; only Balcı et al. 's (2021) participants are from a comparatively eastern country, Turkey.

The sharer: experience as a recipient and peer acceptance. Researchers also think that having experience as a recipient affects children's generosity (Birch & Billman, 1986; Rao & Stewart,1999). Typically, children would like to share more when they are frequently given something in their daily life. Meanwhile, Asscheman et al. (2020) found children who are disliked by classmates share less with others while those who are liked by classmates share more, particularly with friends. However, these conclusions may lack validity as few studies have also proved them.

Diversities

Plentiful studies show mixed results in children's sharing behavior, and some of them even contradict each other. However, when grounding them in a culturally diverse perspective,

we can find some explanations for the discrepancies and draw patterns of differences. This part of the paper will explore how children share differently through a broad cultural dimension perspective (level 1 of *Figure 1*) and a detailed socio-contextual perspective (Level 2 of *Figure 1*). Factors in Level 1 categorize different countries by collectivism versus individualism or via power distance (Hofstede, 1980 & 2001). While six factors are listed in level 2, we mainly discuss two of them, including parenting style and gender, since others will either be examined together with them or have been examined in previous similarity patterns.

Level 3: culture dimensions

Collectivism versus individualism. Researchers that compare children's sharing behaviors in different countries often use Hofstede's (1980 & 2001) work to categorize countries into collectivistic or individualistic cultures, within which many eastern countries (e.g., China, Indonesia, and Pakistan) and some small scale or rural societies (e.g., Fiji, Peru) are identified to be collectivism while many western countries (e.g., United States, Germany, Australia) are considered individualistic societies. A large body of research has shown that different cultural orientations influence the quantity, frequency, and reasons for sharing behavior (Birch & Billman, 1986; Roa & Stewart, 1999; Stewart & Mcbride-Chang, 2000; Rochat et al., 2009; Wu et al., 2018). From these studies, we could draw the following two lines of patterns.

First, children from collective societies share more in quantity and frequency and are more likely to share spontaneously than peers from individualistic cultures. For example, Rao and Stewart (1999) found that 4-year-old Asian children share more frequently and more food than their American peers during the dictator game. Rochat et al. (2009) observed that 3 and 5-year-old Peruvian and Fijian children are more generous and fairer in resource distribution,

probably because they grew up in small scale and traditional societies which are inclined to collectivism, compared to children from rich and urban cultures which are thought to promote individualistic values. Moreover, Asian children were less likely to resist requests from the recipients than Americans, though Chinese children usually share even before the recipients asked while Indian sharers are more passive in sharing because the Indian recipients would take materials without asking the sharers (Birch & Billman, 1986; Rao & Stewart, 1999; House et al., 2012). Researchers explain those differences in that individualistic cultures value self-expression, personal goals, and interpersonal boundaries, whereas collectivist cultures emphasize harmony, group goals, and connectedness (Stewart & McBride-Chang, 2000; Wu et al., 2018). As such, Asian children are more compliant with and tend to satisfy the recipients' demands and American children care more about their own interests during sharing.

Second, children's motivation to share tends to be affected by external influences (e.g., norms, social expectations, authority figures) in collective cultures, while children are probably guided by internal reasons (e.g., individual will) to share in individualistic cultures. There are two sets of evidence supporting this statement. For one, when the recipient is identified, Asian children, particularly Asian girls, share more than when the recipient is anonymous. However, there is no difference in either condition among western samples (Stewart & McBride-Chang, 2000). The plausible explanation may be that the pressure of moral obligation in collective societies pushes children to be generous even when they are internally not willing to do so. Thus, when the recipient is identified, they act to share under such social expectations. But when they don't know the recipient, their feeling of the obligation to share becomes less compelling. For another, Wu et al. 's (2018) study found that 3-to-5-year-old Chinese children are more generous

when their sharing behavior is under the experimenter's eye gaze, but American children show no difference in sharing under such conditions. Interestingly, some American children even refuse to share at all when they feel the pressure of eye gaze from the experimenter, showing that personal will is the most substantial reason to share. However, viewing experimenters as authority figures, Chinese children are inclined to "comply" with them, because Confucianism treats the philosophies of *guai (乖)* as a merit of children, which emphasize obedience and good behavior (Chao, 1994).

Power distance. Hofstede (1991) defines power distance as the degree of inequality between a less powerful individual and a more powerful other in a hierarchically ordered system of social relationships. In his Power Distance Index (PDI), high scores indicate a strong social hierarchy, while lower scores mean that ordinary people have opportunities to work closely with authority figures. In terms of the relationship between power distance and children's sharing behaviors, we could use this lens to see how culture impacts children's sharing under limited resource provocations. French and colleagues (2011) conducted a study between Chinese and Canadian 7-year-olds, during which four children in a group had to share just one toy with each other. The results show that though Chinese children were more actively engaged in spontaneous giving (giving the toy to others without being asked) when confronted with a conflict situation (other children didn't give the toy to them when it's their turn), Chinese children used more physical or verbal action to gain control. Contrarily, Canadian children exhibited more turn-taking bids and frequently referred to norms of sharing. Researchers also observed that Chinese groups were more likely to show or ask for a leadership figure who coordinates the group's actions than Canadian groups. Referring back to PDI, China has a moderately high score, and Canada scores relatively low in power distance (Hofstede, 1991). Bond and Kwang (1986)

suggest that Chinese people expect the leader to resolve conflicts and regulate activities due to the impact of hierarchical structures in Chinese societies. This study revealed that such authority hierarchies have already existed in children's sharing. In contrast, children from Canadian societies are prone to resolve conflict through turn-taking and negotiation, which fits the norms of individual rights and equity in the society. Similar dynamics of power distance in children's sharing behavior are also found in the materials exchange situation between the Chinese and American children in Navon and Ramsey's (1989) studies. Therefore, we may conclude that cultural power distance affects children's strategies to solve conflicts in sharing behavior. Typically, lower power distance may bring less assertive but more norm-referring actions in sharing, and higher power distance may generate or find leadership figures (e.g., teachers) to regulate other children's sharing behaviors.

Level 2: social-contextual factors

Parenting style. The development of children's sharing behaviors is impacted by parenting-style behaviors not only through their own observation and imitation but also by deliberate training from parents, which are deeply affected by cultural values. As an essential and influential candidate for children to learn behaviors, parents' sharing models how their children share. For instance, even 12-month-old infants were more likely to offer their materials to others when they saw their mothers offer objects at others' request (Hay & Murray, 1982). Blake et al.'s (2016) study showed that 3-8 years old Indian children followed both generous and stingy models of their parents' sharing, with the increasing influence of the generous model over age. However, in the US sample, children across ages only followed the stingy models, indicating another mechanism of parenting styles that influences children's sharing. Researchers throughout time have found that different parenting styles (i.e., responsiveness, harshness, intrusiveness) are

related to various sharing patterns, but such an effect depends on if there is an optimal fit between parenting practices and children's characteristics (Whitesid-Mansell et al., 2004; Wang et al., 2006; Kartner et al., 2010). While most individualistic western parents adopt an "autonomous" parenting style (i.e., inductive reasoning, non forceful control) towards their children's sharing behaviors (Radke-Yarrow et al., 1983), Asian parents often deliberately train children to think of others and value the approval from others as an important source of identity (Markus & Kitayama, 1991). Thus, it's not strange at all to see that Asian children are found to share more across studies (e.g., Birch & Billman, 1986; Rao & Stewart, 1999; Stewart & Mcbride-Chang, 2000; Rochat et al., 2009) because they have more chances to be taught about being generous and higher exposure to contexts with opportunities to learn and practice sharing. However, researchers argue about whether the sharing behaviors induced by training and demandingness show true altruism of children or just a form of obedience (Chao, 1994; Stewart et al., 1999). Besides, variability within households from the same culture backgrounds should also be considered, including parental expectations and socialization goals for children, household patterns, and mechanics of everyday activities between family members (Keller et al., 2006;Therborn, 2009; Weisner, 2014).

Gender. Previous studies of gender differences in sharing show mixed, inconsistent, and inconclusive results, partly due to variances in the context of sharing and the characteristics of the recipient. In terms of recipient-related aspects, boys share significantly less with friends in competitive tasks than in noncompetitive situations, while girls choose to share equally between friends and acquaintances if not more with friends (Berndt, 1981; Birch & Billman, 1986). When the recipient is identified, Asian girls share more than Asian boys, whereas western boys and

girls share equally in all conditions (Stewart & Mcbride-Chang, 2000). Asscheman et al. (2020) found that when the recipient is an anonymous other or disliked peer, both boys and girls share less compared to sharing with best friends in the Netherland sample. Nevertheless, girls are liable to share more than boys across conditions (e.g., Birch & Billman, 1986; Radke-Yarrow et al., 1983; Asscheman et al., 2020). Some scholars try to explain such phenomena through differences in gender expectations during children's socialization into societies. In some cultures, girls are early assigned with responsibilities such as family chores and caretaking, during which they are forced to be more generous. Graves and Graves's (1983) study in the Cook Islands of Polynesia found that girls are included in household work to help elders and care for younger siblings while boys are not expected to do so and learn sharing during peer play. Gummerum et al. (2008) suggested that in most cultures, parents more frequently and consistently reinforce altruistic behaviors for girls. Such differences in nurturance and expectation contribute to the general trend that girls share more than boys.

Culture Theories

While cross-cultural patterns present some clues to understand children's sharing behaviors through developmental trajectories and different factors, scholars still wrestle with how cultural mechanisms are placed on children's decision of sharing and how cultural influences interplay with other factors. This part of the paper will review research that touched upon the intersection between culture theories and sharing behaviors and attempt to trace cultural sources to explain major differences in children's sharing behaviors across societies.

Culture dimensions: Collectivism vs. Individualism

Societies and cultures differ in various dimensions that have implications for sharing behaviors. However, the collectivism-individualism (CI) dichotomy is the most popular

dimension to frame and examine group differences among literature. In the above examined research, most research studies place nations or unique cultural groups as units to decide whether they belong to the definition of collectivism or individualism.

Feygina and Henry (2014) concluded two main differences between the two kinds of cultures. First, the extent to which the individual is interdependent with others varies vastly as "collective norms, expectations, and obligations contextualize personal identity and development" (p. 13) in collectivist cultures while "personal goals, experiences, and beliefs" (p. 13) are the essential elements to build the concept of self in individualistic cultures. Second, the relationship between the individual and the group is different. In collectivist cultures, individuals are obligated to think, prioritize, and even sacrifice for the benefit of the bigger group, and there is limited possibility of mobility within groups and switching between groups. However, people usually value personal benefit over the group good, and they are free to leave or switch groups when they feel the membership costs too much for them in an individualist culture.

According to most studies we discussed above, the broad CI variable is related to children's sharing behaviors in both direct (e.g., through the effect of social norms and values children engage with daily) and indirect ways (e.g., through impacting parenting styles and expectations, then influencing children's behaviors). The typical pattern is that children from societies that promote collectivist values tend to, and feel obligated to share more in frequency and quantity, especially on public occasions, compared to their peers from societies that value individualism. Some research assumes that children will consider more external reasons to share with others in collectivist culture because their reputation and responsibility for others are valued while those from individualist culture usually only share out of personal willingness.

Nonetheless, we still know little about what sources account for the differences between individualist and collectivist cultures in sharing behaviors.

Sources of CI Differences in Sharing Behaviors

Research studies that directly speak to how subconcepts of CI affect sharing behaviors are limited. In light of Hofstede's (2000) comparative culture theories and other cultural-specific research (e.g., Feygina & Henry, 2014), I conclude the following factors as sources of CI differences: cultural norms and expectations (Brett, 2001; Stewart & Mcbride-Chang, 2000), status and power (Probst et al., 1999; Kopelman, 2008), social environment (Brett & Kopelman, 2002), and embeddedness (Yamagish et al., 2008) (see Table 1).

Cultural Norms and Expectations

House (2018) stated that norms guide people to do what most members of the community are doing and what they believe they should do. He also proposed that norms affect people's behaviors by changing people's expectations. For example, in a situation where people have chances to get a free ride and let others do more, social norms would prevent such results by changing their expectations in two ways. First, people would be aware that others expect them to contribute and they probably will get punished for being selfish. Second, in people's set of preferences, contributing to others would let them expect the highest payoff (e.g., they would feel good and rewarded). The degree of others' expectations that matters to individuals and the sequence of the preference set vary in societies with different CI values.

Collective cultures (e.g., China) value social norms that everyone has a commitment to each other, and people take for granted that they prioritize others' expectations and feelings. By contrast, in individualistic cultures (e.g., US), commitment for the group or other members is established on communication and shared vision. So people don't have such strong expectations

that others should take the same actions they did (Brett, 2001). From another perspective, how people perceive norms are different between CI cultures. Especially in terms of fairness in sharing, people from collectivist cultures would consider equal resource allocation to be fair and people in the power status to have the responsibility to act fairness to those who are in need. However, people would think fair sharing should be based on the contribution or performance of community members in individualistic cultures (Brett 2001, Kashima et al., 1988).

In terms of children's understanding and engagement with cultural norms and expectations, studies have hypothesized that imitative learning is one possible pathway (Lancy, 2014). Children learn cultural norms and expectations through observing and interacting with their parents. In the meantime, their sharing behaviors are formed and reinforced by parenting practices, which align with social norms and expectations of the culture (Stewart & Mcbride-Chang, 2000).

Status and Power

While status and power are also pertinent to the dimension of power distance discussed above, some scholars tend to include such concepts under the umbrella of the CI dimension since 1) the structural hierarchy of societies is closely related to their CI values (Probst et al., 1999, Kopelman 2009), and 2) most countries' ranking in power distance index (PDI) is similar to their position in the CI dimension continuum (Hofstede, 1980 & 2001). I include status and power as a source of CI differences because evidence suggests that such differences are more prominent when adding the scope of hierarchy and power concerns.

Feygina and Henry (2014) concluded that cultures that endorse horizontal power strive for equality while those who have vertical structures accept inequality. While few studies directly talk about the intersection of children's sharing behaviors and horizontal-vertical CI

differences, Probst and colleagues (1999) found that on cooperative tasks that require self-sacrificing, vertical individualist cultures have the lowest scores, whereas vertical collectivist cultures have the highest scores, with horizontal individualist and collectivist cultures in the middle. Similarly, when it comes to situations where people have the power to decide resource allocations, people from the Israeli population (vertical individualist culture) tend to be self-benefitting. In comparison, the US sample (horizontal individualist culture) exhibits lower egocentrism and more fairness (Kopelman, 2009). Although these results are based on adult populations, we still think young children's sharing behaviors have already more or less been affected by the combined effects of power hierarchy and CI differences in their culture. This is because as early as three years old, they begin undergoing early stages of socialization to the culture (Rakoczy & Schimidt, 2012). However, the mechanism of how power and status exercise their effect on young children's sharing behaviors is still a puzzle.

Social Environment

In a general sense, the social environment in collective culture promotes prosocial decisions that benefit both parties in an interaction. If there has to be a sacrifice or less benefitting one, the self is obligated and expected to shoulder such responsibilities. On the other hand, individualistic cultures orient people to increase personal gain within the boundary of social norms and expectations (Brett & Kopelman, 2002). In this context, social environment is an abstract concept that consists of and interplays with numerous factors such as social values, economic backgrounds, power structure, parenting styles, etc. It's hard to detail how the social environment impacts children's sharing. However, it is still an indispensable element to trace the sources of difference in CI dimensions, since recent empirical studies have proved that children's

prosocial behaviors are shaped and adapted by their learning and living environments (Villardon-Gallego, 2018; Koss et al., 2020).

Embeddedness

People in collectivistic cultures are embedded in more interconnected social networks, which are characterized by limited mobility. As a consequence, they are cautious and afraid of violating social norms because their reputation and interpersonal relationships will be damaged (Weber & Morris, 2010). Another product of strong embeddedness is in-group favoritism, manifested by an emphasis on prioritizing and maximizing the welfare of members in the same group. While children across most cultures tend to cooperate, help, and share more with peers from the same group, scholars have found that those embedded deeply in collectivist cultures have a stronger tendency to benefit in-group members. Nevertheless, their peers in individualist cultures are more likely to benefit strangers as well. (Kemmelmeier et al., 2006).

Through examining the four lines of sources of IC differences in sharing, it is clear that children's sharing behaviors are fundamentally shaped by the culture they live in. Culture manifests its effect by scaffolding the social environment children live in, deciding the degree to which they are embedded within the social group, structuring the power hierarchy system that affects people's beliefs about equity, and consistently reinforcing cultural values through social norms and expectations they engage with daily. Of course, these sources just describe the general trend of sharing behaviors between cultures with different collectivist and individualistic values. Detailed mechanisms of how smaller factors related to the four sources affect sharing behaviors are still needed to be explored by future researchers. Additionally, since limited literature directly speaks to the intersection of culture and children's sharing behaviors, our scope of culture theories is restricted to the collectivism and individualism dichotomy. We certainly need

more studies and theories that investigate other aspects of culture to deepen our understanding of cultural influences on sharing behaviors.

Based on the above cross-cultural patterns and culture theories, two findings can be concluded. First, the differences in sharing behaviors across different CI cultures are not whether children would like to share, but the questions of how much they would like to share, under what circumstances they are sharing, and what is the intrinsic reason that motivates them to share. How children approach these questions during sharing is rooted in and deeply reflected by their cultural values. Second, the "V-shape" trajectory of sharing behaviors from infancy to middle childhood verifies the culture positioning model we proposed in the beginning of this section of the paper. Biological and developmental foundations provide opportunities for children's high frequencies of sharing during infancy and toddlerhood. Around three years old, the tension between their developmental resources and the process of realization of cultural norms causes the diminishing period. However, when they approach age seven, their behaviors become aligned with adults since they begin to fully engage with the social world.

Conclusions

As the studies reviewed in this paper reflect, while a certain level of motivational and cognitive abilities may provide foundations for children to make a fair resource allocation with others, their sharing behaviors are malleable and fundamentally shaped by the culture they live in. Thus, some research has put forward strategies that could promote the quantity and frequency of sharing behaviors for young children. For infants and toddlers, studies found that deliberately eliciting children's attention and description of emotions in age-appropriate picture books during parent-child reading times would help children share more quickly and frequently (Brownell et al., 2013). For children with pre- or formal schooling experiences, their sharing behaviors can be

positively related to the teacher's guidance. Detailed actions such as whether the teacher modeled, induced, reinforced, and provided opportunities to practice sharing behaviors can make a difference in children's decision of making a fair sharing (Bergin, 2014; Steinbeis & Over, 2017). However, if we place too much importance on strategies to increase children's sharing behaviors, we may deviate from the initial intention of human sharing behaviors because children may share with others out of obedience rather than their willingness and altruism.

Moreover, those strategies may be useless in the scenarios like the one described at the beginning of this paper in which the young me was so heartbroken because my belongings were forced to be taken away and the kindergarteners in my class were so angry to give up the toys to others. Thus, in addition to promoting children's sharing behaviors for the sake of their better social relationships and academic development, parents and educators across cultures should see children's needs and take care of their emotions related to their materials. Instead of requiring sharing behaviors among children, we need to give them enough time with their favorite toys or food and have a fair reason to encourage their sharing behaviors (Tondreau, 2019).

This review presented developmental trajectories, a multi-level system of factors that affect sharing, and culturally diverse patterns of young children's developing sharing behaviors and addressed previously neglected cultural influences. While it may be the first literature review that holistically addresses previous patterns of research about sharing behaviors and traces sources of cultural differences, it certainly has several limitations due to the way of categorizing cultures by countries, neglected populations, and the analysis of software algorithms. First, besides the single perspective of individualism-collectivism dichotomy, some conclusions about cultural differences among children from different societies may be over-generalized as they may neglect variabilities within them. For example, we sometimes use "US children" or "Asian

children" to present a generally recognized sharing pattern. However, there are certain differences among children's sharing behaviors even if they all live in the US or come from Asian countries since smaller cultural groups and children's experiences within them will cause diverse forms of sharing behaviors. Second, the psychological development of and cultural influences on sharing behaviors of children with special needs was not included in this review, which may otherwise provide more information about the relationship between brain functions or gene foundations and children's sharing behaviors. Third, the visual patterns of previous literature may be biased not only from the lens of the writing language and database selection but also because of the analyzing algorithms of the software CiteSpace. As we know, those labeling dots (set by thresholds) in visual patterns created by CiteSpace are based on how many times this software detects the exact same words or phrases among literature databases. However, unlike disciplines such as nature or engineering science, which have fixed terms to describe a concept or phenomenon, scholars in our field may have more flexibility to describe our research topics in the abstract and keywords part of the paper. Thus, we may be unable to see or combine some keywords that are also widely discussed among literature since CiteSpace didn't present them, making the analysis based on virtual patterns not as accurate as what papers from other disciplines do when they adopt the tool of CiteSpace.

Future research can benefit from the following research directions. First, the mainstream research methods in the current field are cross-sectional studies. However, longitudinal studies about the development of young children's sharing behaviors would be more helpful to clearly inform age differences and developmental trajectories that are influenced by cultural factors. Also, tracing children with bicultural or multicultural backgrounds and their developing sharing behaviors may help uncover cultural mechanisms to a certain degree. Studies may adopt

ethnographic methods to explore in-depth sources of cultural differences and the process they exercise on the effects on sharing behaviors. Additionally, we need to include more countries and cultures that are not presented, especially those in eastern or other less studied societies. If given opportunities, data from studies that are written in other languages should also be examined and added to the current English writing field.

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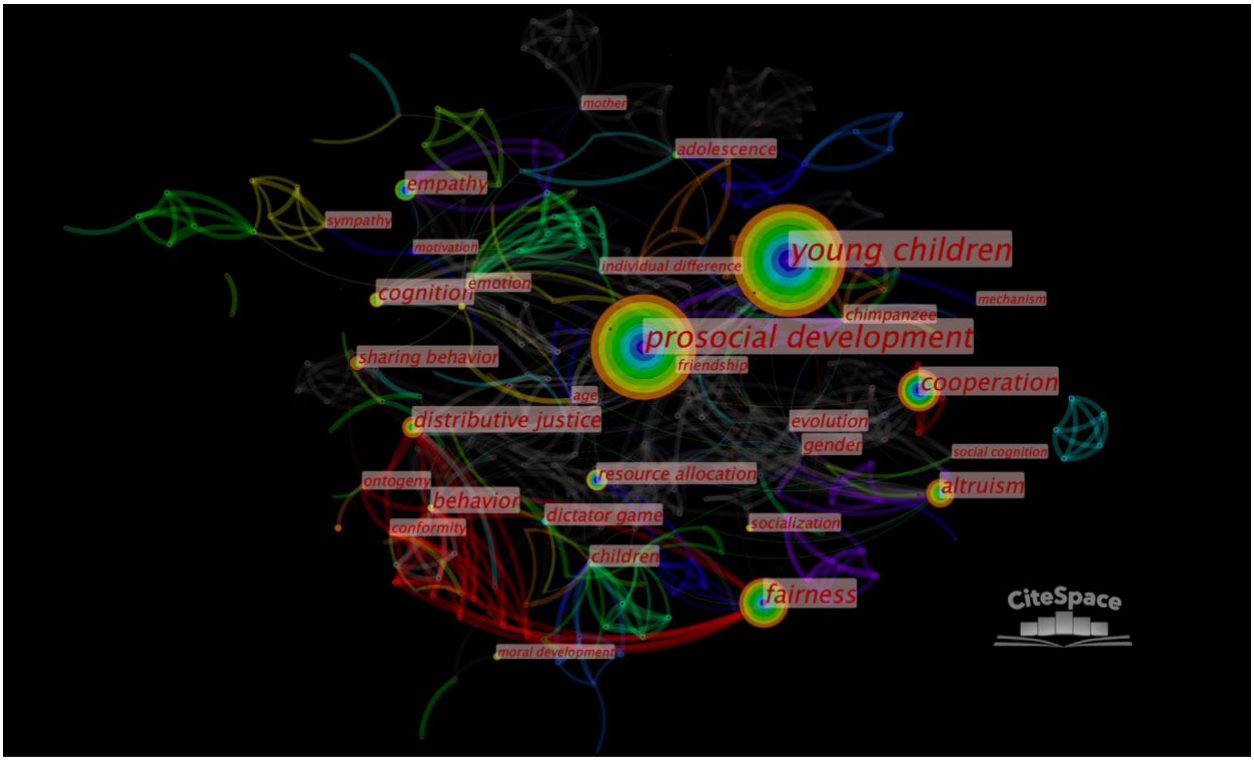
Picture 1

Key topics among literature about children's sharing behaviors



Picture 2

Targeted populations among literature about children's sharing behaviors

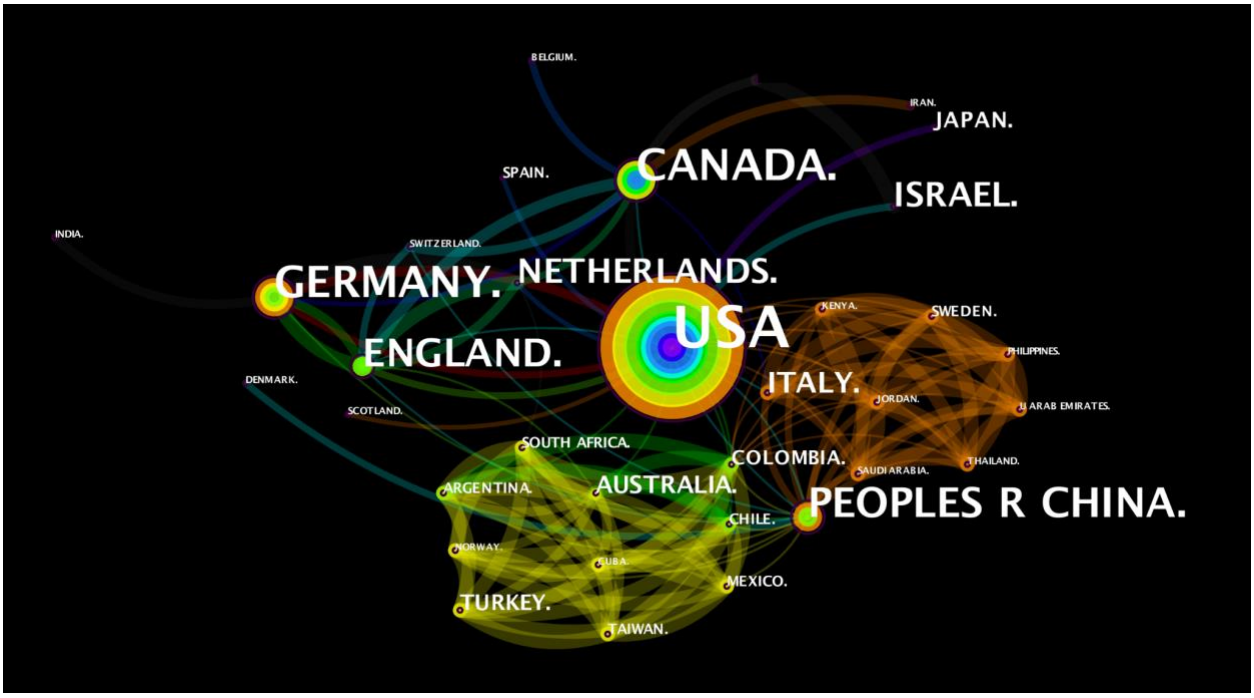


Figure 1.

A 3-Level System of Factors that Impact Sharing

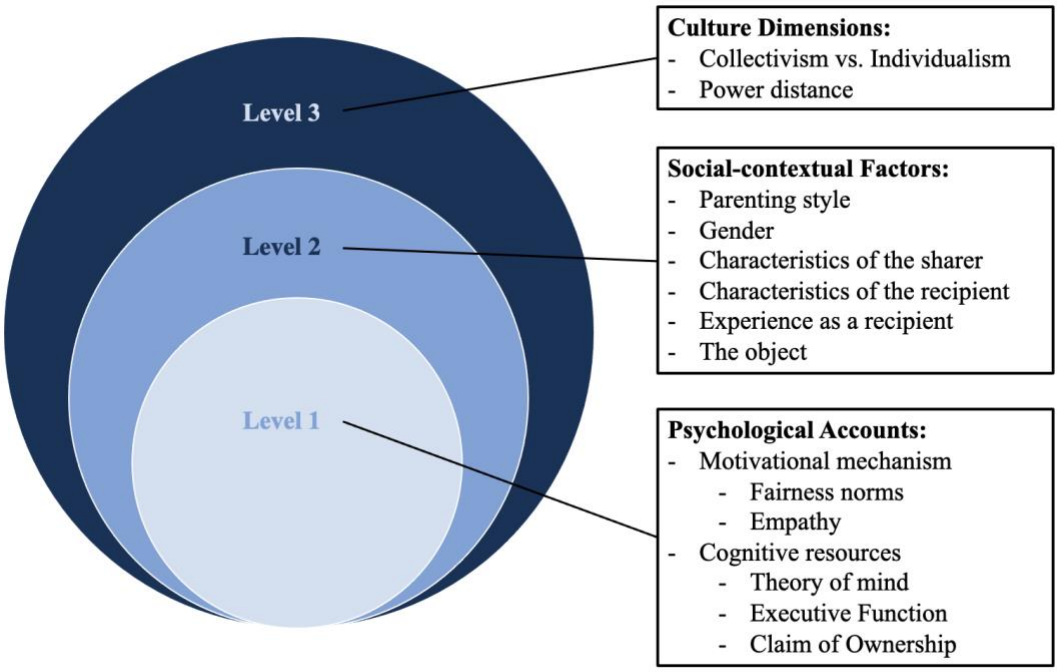


Figure 2.

Developmental Trajectory of Costly Sharing Behavior from Infancy to Middle Childhood

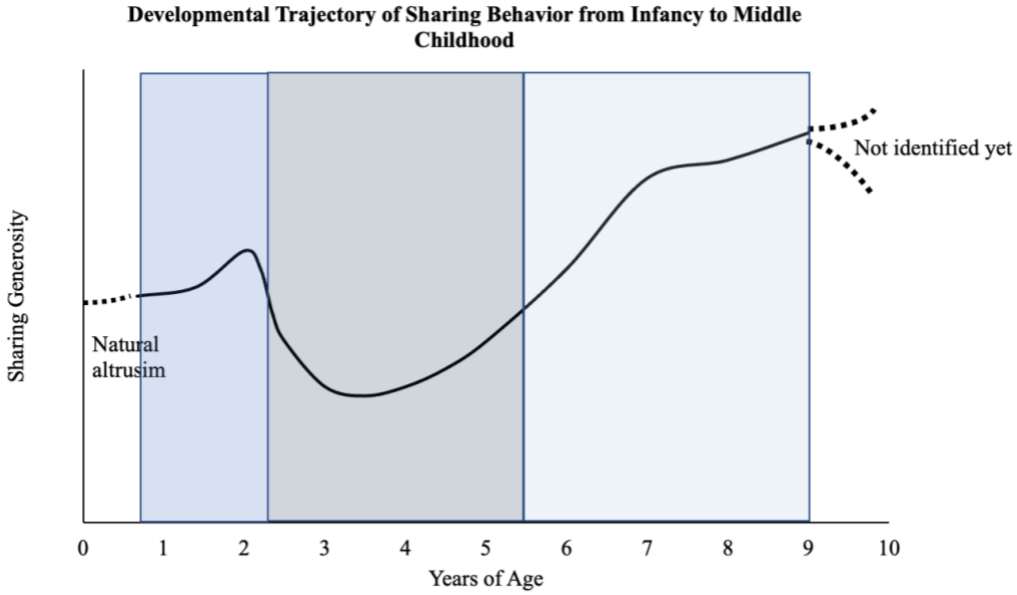


Table 1

Sources of Collectivism-Indivdualism Differences in Sharing

Differences	Collectivist Culture	Individualistic Culture
Cultural norms and expectations	Prioritize others' expectations and feelings. Have strong expectations that others should share fairly as they did.	Commitment for others is based on communication and shared vision.Consider contributions and performance of group members.
Status and Power	Vertical collectivist cultures have the highest scores in self-sacrificing.	Vertical individualist culture (e.g., Israeli) < Horizontal indivdiualst culture (e.g., the US)
Social Environment	Promote sharing decisions that benefit both parties.	Increase personal gain within the boundary of social norms and expectations.
Embeddedness	Benefit in-group members.	Also benefit strangers.