Do Young Children Understand Anonymity & Does Anonymity Influence their Sharing?

by

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Dedication Page

To Mom.
If there is such a thing as vicariously earning a PhD, you've earned it.
(And you won't even have to wear the floppy hat.)

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Abstract

Previous research has confirmed that numerous variables influence children's sharing; however, little work has investigated whether children share differently in anonymous and non-anonymous contexts. Manipulating anonymity affords one way of testing whether children, like adults, share strategically less as anonymous donors than as identified donors. Testing children's anonymous sharing allows speculation on factors that may motivate children's sharing. Thus, the goals of this dissertation were to (1) shed light on children's understanding of anonymity, (2) examine whether anonymity influences generosity, and (3) test for preferences for anonymous versus non-anonymous sharing. This dissertation explored 3- and 5-year-old children's anonymous sharing through four experiments, which empirically tested the following research questions: (1) Do young children understand anonymous sharing?; (2) Does anonymity influence how much children share?; and (3) Do children prefer to share as, and receive from anonymous or identified donors? These questions contribute to the understanding of motivational and contextual factors that could influence children's sharing. Experiments 1 and 2 assessed children's understanding of anonymous sharing. Results indicated that children understood identified sharing; however, 5-year-olds understood anonymous sharing more reliably than 3-year-olds. In Experiments 1, 2, and 4, dictator games were used to test whether anonymity impacted children's generosity. Results suggested that children shared similarly regardless of whether they were anonymous or identified donors; even when children chose whether they shared as anonymous or identified donors. Finally, Experiments 3 and 4 examined whether children preferred to share as, and receive from anonymous or identified donors. Results demonstrated that children strongly preferred to both share as, and receive from identified donors. Together, information from these experiments suggests that (1) 5-year-olds' understanding of anonymous sharing has begun to develop; this understanding has emerged for 3-year-olds but is more fragile; (2) at age 5 years, anonymity may not influence children's generosity; and (3) school-aged children have a preference for identified versus anonymous sharing. In summary, this dissertation provides information on a relatively unexamined area of children's prosocial development. This work offers direction for future research and influences the interpretation of previous research that tested very young children in paradigms featuring anonymity.

List of Abbreviations Used

ANOVA   Analysis of Variance

M   mean

N   number in the sample

n   number in the subsample

p   p-value indicating probability

SD   standard deviation

t   t-value calculated from a *t*-test

ToM   Theory of Mind

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"There is a crack in everything. That's how the light gets in." – Leonard Cohen

Chapter 1: Introduction

1.1 The Value of Prosociality

As adults, we spend many of our waking hours interacting with others, either by choice (e.g., pub nights with friends) or by necessity (e.g., Monday morning meetings at work). These social interactions serve a variety of purposes; indeed, humans benefit from, and depend on, cooperative and social interactions with others (Boyd & Richerson, 2006). Maintaining positive social exchanges requires some finesse. For example, it is better to ask politely for a friend's assistance than to demand it. By asking for help, it engenders a more positive experience for the other person, which could increase the likelihood of procuring a favourable outcome. Some of the actions that facilitate positive social exchanges include *prosocial behaviours*. Prosocial behaviour refers to actions such as helping, sharing, and caring; prosocial acts have been described as voluntary behavior to benefit another (Eisenberg, Fabes, & Spinrad, 2006, p. 774). Prosocial behaviour has been observed across the lifespan, even among very young children.

In addition to benefiting others, behaving prosocially is also beneficial to the self. For instance, prosocial behaviour helps adults maintain personal and professional relationships, promotes their image as kind and generous, and increases the likelihood of having favours returned in the future. Thus, although prosocial behaviour clearly benefits the recipient, those who conduct themselves prosocially are also often rewarded (e.g., Fehr & Fischbacher, 2003). Accordingly, adults' prosocial behaviour may be motivated by a number of factors, including the desire that they will eventually benefit from seemingly altruistic prosocial behaviour. In the current studies, prosocial behaviour that

are conducted in order to yield future benefits are termed, *strategic*. For instance, *strategic sharing* refers to acts of sharing that are anticipated to benefit the donor at a later time. Some research indicates that 3-year-olds may not initially consider strategies, but with repeated trials they can develop strategies (e.g., Hala & Russell, 2001).

Adults have demonstrated strategic prosocial behaviour in experimental manipulations (e.g., Ben-Ner, Putterman, Kong, & Magan, 2004; Engelmann & Fischbacher, 2009). A series of computerized helping trials were used to examine if adults' helping behaviour was correlated with whether or not their helping was public (i.e., reputation-building) and whether or not participants knew if a recipient had helped in the past (i.e., the recipient's past behaviour may give the participant a sense of whether the person was likely to help again; Engelmann & Fischbacher, 2009). Results revealed that the majority of adults provided help if their helping was public and/or if the other persons' helping behaviour was known. Conversely, a minority of adults provided help in trials where their helping was private (i.e., their helping could not improve their reputation) or when the other person's helping behaviour was unknown. Interestingly, approximately one third of participants provided help even when their helping was not public *and* when they did not have information about the other person's past helping behaviour. Taken together, Engelmann and Fischbacher's (2009) findings illustrate that adults behave prosocially in a variety of contexts; however, adults augment their prosocial behaviour in scenarios in which they may benefit from their actions.

It is clear that one way in which people try to benefit from their prosocial behaviour is by striving to attain a positive reputation, which is sometimes referred to as *reputation management*. Studies such as these helping and sharing studies suggest that

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reputation is sometimes an underlying motive for adults' prosocial behaviour. Reputation refers to individuals' positive and negative evaluations and beliefs of other people, which is based on social information (De Cremer & Sedikides, 2008). Adults may increase their generosity when they are identified, and when their degree of sharing is known as a strategy to enhance their reputation. Adults are concerned with appearing generous as evidenced by the fact that adults behave more generously when it may help them develop a positive reputation (Hoffman, McCabe, Shachat, & Smith, 1994). Those with good reputations are often rewarded through successful social interactions and improved social standing (Baumeister, 1982). By creating a positive reputation for themselves, individuals can enjoy successful social interactions.

Just as adults may be motivated to improve their reputations, increased generosity may also be a strategy motivated by the desire for reciprocity. Adults have been shown to engage in strategic prosocial behaviour. In a study that assessed sharing behaviour after adults received resources from a donor, half of the participants were informed that they would have an opportunity to share reciprocally with a donor, and half were informed that they would have an opportunity to share with a different person rather than reciprocate (Ben-Ner et al., 2004). Participants who reciprocated with the same donor shared approximately the same amount as the donor shared with them, whereas participants who shared with a different donor shared less generously than the donor who had shared with them. These differences in generosity across recipients suggest that adults are more generous when they think they are sharing reciprocally compared to when they are sharing with a random, novel person with whom they are not reciprocating.

Theoretical explanations attempt to account for adults' strategic prosocial behaviour. Falk and Fischbacher's (2006) proposed a theory of reciprocity wherein positive actions and intentions are postulated as strategic ways to increase the likelihood of future positive reciprocal interactions. Falk and Fischbacher's theory of reciprocity posits that all actions are judged as having either kind or unkind intentions; accordingly, all actions are reciprocated with either positive or negative consequences. That is, individuals respond to, or reciprocate, both kind and unkind acts. They also suggest that positive actions and intentions are strategic ways to increase the likelihood of future positive reciprocal interactions. Similarly, Trivers' (1971) proposed a theory of reciprocal altruism wherein prosocial behaviours are offered based on how many prosocial responses are anticipated in return. According to this theory, prosocial behaviour directed at strangers could be perceived as setting up reciprocal exchanges by initiating friendships, which could lead to future reciprocity. Indeed, Trivers' theory of reciprocity posits that prosocial behaviour is motivated by the goal of ultimately benefiting from one's own actions in the form of future reciprocity.

Little is known about when, in the developmental timeline, children engage in prosocial behaviour with the goal of eventually benefiting from the behaviour. Adults engage in strategic prosocial behaviour, but it is unknown if children are strategically prosocial and motivated by reputation or reciprocity. Indeed, little is known about children's underlying motivations for prosocial behaviour, although Fehr and Fischbacher (2003) argue that usually there are motives that underpin altruistic actions. By examining what motivates children's prosocial behaviour, one can promote these behaviours in children. To promote children's prosociality, it is helpful to answer the following

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questions: when in development do children begin to act prosocially for strategic purposes as adults do? And what drives children's prosociality?

Within the scope of this dissertation, experiments were used to test children's prosocial behaviour with the goal of gaining insight into whether children are strategically prosocial. One way to test whether individuals are strategically prosocial for reasons of reputation and reciprocity is by removing the possibility that they can benefit in the future from their prosocial act. Indeed, examining children's prosocial behaviour in anonymous versus identified (i.e. non-anonymous) contexts is a useful way to examine if children are strategically prosocial for reasons of reputation and reciprocity. Specifically, anonymous prosociality cannot improve children's reputation or increase their opportunity for future reciprocity, whereas if children are associated with their prosociality, their actions may improve their reputation and chance of reciprocity. Thus, if children are motivated to act generously for strategic purposes (e.g., in order to improve their reputation and reciprocity), one would expect to see children behaving more prosocially in identified situations where they may benefit from their actions, and less prosocially in anonymous situations where they cannot reap any benefits. By manipulating anonymity, it is possible to develop a better understanding of whether reputation and reciprocity motivate children's prosocial behaviour.

1.2 Dissertation Rationale and Goals

The aim of this dissertation was to examine sharing in anonymous and identified contexts with the hope of providing insight into whether motives of reputation and reciprocity underlie children's prosocial behaviour. In becoming more knowledgeable about children's sharing motives, it is possible to support the development of prosociality

in childhood. Theories on reputation and reciprocity postulate that prosocial behaviours are committed with the overarching goal of personally benefiting from future reciprocity or a positive reputation. If the goal of prosocial behaviour is personal gain, then there ought to be a decrease in prosocial behaviour within the context of anonymity because anonymous prosocial behaviour neither increases the likelihood of reciprocity, nor does it enhance one's reputation as prosocial acts are undetected. Thus, if someone acts less prosocially when they are anonymous compared to when they are not anonymous, it supports the idea that prosocial behaviour are conducted with the goal of benefiting the individual who engages in them.

In the studies described in this dissertation, children's prosocial behaviour was examined in experimental paradigms to test whether children behaved strategically prosocially. To test this empirically, children participated in sharing paradigms where they were given opportunities to share as anonymous or identified donors. Anonymous sharing contexts eliminate the possibility of future reciprocity and the possibility of reputation management. Thus, in the context of anonymity, it is possible to examine whether underlying factors (such as reputation and reciprocity) motivate children's prosociality. In other words, anonymity is a valuable manipulation that allows one to tap into whether children's sharing is motivated by reputation and reciprocity, and generate a better understanding of whether or not children share strategically. If children share with the ultimate goal of personally benefiting, then children ought to share less as anonymous donors, and share more as identified donors.

1.3 The Emergence of Prosocial Behaviour and Influential Factors

      1.3.1 Prosociality is influenced by age. Children show a proclivity to share at a

very early age. For instance, Hay, Caplan, Castle, and Stimon (1991) found that children as young as 1 year of age shared with unfamiliar children. In their study, 1- and 2-year-olds were assigned to triads comprised of three child participants. Children were presented either two or six toys to play with in their triads; half of the trials included duplicate toys. Children were observed to see if they spontaneously shared toys with each other. Hay and colleagues found that sharing was present at both ages, although 2-year-olds were more likely than 1-year-olds to share in conditions with duplicate toys compared to conditions without duplicated toys. Hay and colleagues concluded that these findings indicated that 2-year-olds have a rational way of sharing. In a separate child-parent sharing study, 1-, 1.5-, and 2-year-olds were presented sets of toys and observed to determine if they shared spontaneously (Hay, 1979). Results revealed that children shared toys with their parents as early as 1 year, but 1.5- and 2-year-olds shared more frequently than 1-year-olds. These studies provide evidence that children are willing to share with parents and unknown peers as early as 1 year of age, and that by 2 years of age, children may share strategically based on the availability of resources.

Dunfield, Kuhlmeier, O'Connell, and Kelley (2010) demonstrated that 1.5-year-olds could identify when someone else can benefit from specific types of prosociality and they behaved prosocially, accordingly. That is, Dunfield and colleagues studied 1.5- and 2-year-olds' helping and sharing behaviour. In experimental helping trials, the experimenter appeared to need help grasping an object (control condition: the experimenter looked neutrally at the out-of-reach object). In experimental sharing trials, participants received four crackers and the experimenter received no crackers; the experimenter looked sad and held out an open hand toward the participant (control

condition: the participant and experimenter each received two crackers). In both the helping and sharing conditions, 1.5- and 2-year-olds were more likely to engage in prosocial behaviour in the experimental versus control conditions. These findings indicate that even very young children are capable of appropriately helping and sharing with adult strangers.

Toddlers also exhibit reciprocal prosocial behaviour. Levitt, Weber, Clark, and McDonnell (1985) paired toddlers in the laboratory, and gave only one toddler a toy for a period of time. Then, the situation was reversed while the other toddler received a toy. Parents were instructed not to interfere unless, after four minutes, their child had not offered the toy to the other toddler. Results showed that, typically, children did not initiate toy sharing without parental prompting. However, toddlers were significantly more likely to reciprocally offer their toy to the other toddler after they had been offered a toy than if they had not been offered a toy. Even 2.5-year-olds appeared motivated to share based on reciprocity.

While the propensity to share has been shown from an early age (Hay, 1979), some researchers suggest that children share more generously with age (e.g., Benenson, Pascoe, & Radmore, 2007). In their study, Benenson and colleagues (2007) asked children aged 4, 6, and 9 years to select 10 stickers from an array that they wanted to keep. Participants were then told that the stickers belonged to them, but if they wanted to - and only if they wanted to - they could share their stickers with another child. Children participated in a dictator game. The dictator game is an experimental paradigm where participants unilaterally decide how many resources to distribute to themselves and to a recipient in a single allocation. In this paradigm, the recipient does not have the option to

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decline or reciprocate offers. Generous offers can be seen as an indication of prosociality. In Benenson and colleague's study, the experimenter stressed that children's sticker allocation in the dictator game would remain anonymous. There was a significant effect of age, in which 9-year-olds shared significantly more stickers (approximately 3 to 4 stickers) than 4-year-olds who shared approximately 2.5 stickers. On average, children donated between 20% and 30% of their stickers to another child. This study demonstrated that in anonymous sharing contexts children as young as 4 years of age share, and that sharing generosity increases until age 9 years. Taken together, past work indicates that the dictator game is a developmentally appropriate paradigm to assess sharing in children as young as 3 years.

Other research, such as Harbaugh, Krause, and Liday (2003) suggested that the association between increased generosity and age may not follow a linear trajectory. Using a within-participants design, Harbaugh and colleagues tested children in Grades 2, 4/5, 9, and 12 in both dictator game and ultimatum game paradigms. In the ultimatum game, one party proposes an offer to recipients, and recipients choose to either accept or reject the offer. If recipients accept the offer, they keep the amount of resources offered, and proposers keep the amount allocated to themselves. However, if the recipients reject the offer, they do not keep any of the resources, nor do the proposers. Results from the ultimatum game indicated a linear relationship between age and sharing, in which sharing generosity increased with age. However, Harbaugh et al. demonstrated a non-linear relationship between age and generosity in the dictator game. On this task, children in Grades 2 and 9 offered less than children in Grades 4/5 in a dictator game. This increase of generosity in middle school-aged children could be taken as a sign of a generalized

preference for fairness, where similar amounts of resources are allocated to the self and the recipient. Perhaps children at this age endorse fairness norms more strongly than participants who were a bit younger (who may behave more selfishly) and compared to participants who were slightly older (who may have considered more sophisticated contextual cues in deciding how to allocate resources; e.g., *this person cannot reject my offer, therefore, I can share as much or as little as I want*).

Grunberg, Maycock, and Anthony (1985) also found a non-linear relationship between sharing and age but showed the opposite pattern of generosity compared to Harbaugh et al. (2003). In Grunberg and colleagues' two field studies, 7- and 8-year-olds shared pennies and candies less generously compared to younger and older children. Recent work continues to indicate that generosity may not linearly increase with age (e.g., Gummerum, Keller, Takezawa, & Mata, 2008). As pointed out by Eisenberg and Fabes (1998), "there has been little consensus on whether or not there are age-related changes in the development of prosocial tendencies" (p. 747). One aim of this dissertation is to test developmental sharing differences between 3- and 5-year-olds.

Together, these findings indicate that children's sharing may be influenced by age, although the pattern is not clear. Furthermore, the use of different paradigms makes it difficult to compare findings across experiments. That is, participants seem to share less in game-based research contexts in which they have the final say in how much they wish to share without any negative repercussions (i.e., dictator paradigm) compared to game-based research contexts in which they know that their resource allocations could be rejected (i.e., ultimatum paradigms).

1.3.2 Prosociality is influenced by the recipient. Prosocial behaviour toward certain

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individuals may be more beneficial than arbitrary prosocial behaviour toward random strangers. Historically, acting prosocially toward others may have increased our ancestors' chances of survival in harsh environments (Baschetti, 2007). Nowadays, prosocial behaviour continues to benefit individuals, indeed, research indicates that individuals are differentially prosocial toward recipients based on numerous recipient factors, which are outlined below. For example, Fehr, Bernhard, and Rockenbach (2008) assessed 3- to 8-year-olds' resource allocation toward different recipients. First, children were shown photographs of the recipients and then they had opportunities to allocate candies to recipients whom participants did not know (i.e., out-group recipients) or to recipients whom participants knew from their community (i.e., in-group recipients). Children preferred to share fairly with in-group recipients, and less fairly with out-group members, which supports the fact that the recipient influences sharing behaviour.

Moore (2009) also tested the influence of recipients on sharing. Specifically, Moore used a sticker resource allocation paradigm to test 4- to 6-year-olds' sharing choices across friends, familiar non-friends, and strangers. In this study, children were more inclined to share (rather than keep all the stickers for themselves) with friends than with non-friends or strangers. Indeed, children allocated resources to friends even when sharing meant incurring a cost, including giving up a sticker and enduring a time delay before receiving their sticker. This provides evidence for selective sharing behaviour among preschool-aged children dependent upon their relationship with the recipient.

Expanding on Moore's (2009) work, 4.5- to 5-year-olds' decision-making on behalf of a third party was assessed through Paulus and Moore's (2014) resource allocation paradigm. In Paulus and Moore's study, children were introduced to Blue Bear

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and were asked how Blue Bear would want to allocate stickers or balloons between himself and two recipients: Yellow Bear (who was Blue Bear's friend), and Red Bear (whom Blue Bear disliked). Results revealed that 4- and 5-year-olds chose to share more generously on behalf of a third party with friendly recipients rather than disliked recipients.

Moreover, findings from Paulus (2014) suggest that by age 5 years (but not 3 years) children have developed the ability to assess recipients' needs and respond prosocially without prompts. That is, Paulus (2014) manipulated recipients' wealth to test children's underlying motivation for prosociality. Specifically, the aim of Paulus' experiments was to test if preschool-aged children distributed resources differently with wealthy versus poor recipients. Results indicated that 5-year-olds, but not 3-year-olds, shared their own stickers, at a cost to themselves. Likewise, 5-year-olds, but not 3-year-olds allocated third party stickers, where there was no associated cost, more generously with poor than wealthy recipients. Interestingly, 3-year-olds allocated more generously to wealthy than to poor recipients. Paulus' (2014) findings revealed that older children behaved prosocially when recipients were associated with having needs. Thus, past work shows that children share differently based on characteristics of the recipient, such as the recipient's relative wealth (Paulus, 20014). Indeed, children's differential sharing appears strategic in nature (e.g., sharing more with a friend than a foe; giving more to the wealthy than the poor).

1.3.3 Prosociality is influenced by fairness. The affinity for fairness is another factor that influences children's sharing. Children may develop a preference for fairness based on endorsing social norms that are rooted in the notion that everyone deserves

equality. Alternatively, some researchers argued children may share fairly in order to personally benefit from appearing fair (e.g., Shaw, et al., 2013). Behaving fairly allows individuals to act in a way that both benefits another person, while maintaining their own interests.

An awareness of fair sharing is evident among young children. In a series of experiments, Smith, Blake, and Harris (2013) used interviews, measures of inhibitory control, and a resource allocation task to assess 3- to 8-year-olds' understanding of fairness and their sharing behaviour. Results revealed that younger children recognized the fairness norms in their interviews, but they failed to make equitable sharing decisions in the resource allocation task. Interestingly, even young children performed well on measures that assessed their inhibitory control, which ruled this out as an explanation for young children's behavioural mismatch between their knowledge and their actions. Meanwhile, results from interviews with 8-year-olds revealed that they were aware of fairness norms; moreover, they behaved in a way that was congruent with these norms and expectations during the resource allocation task. It seems that older children were more likely than their younger peers to share in accordance with the fairness norms.

Fair sharing is exhibited by older children, around age 7 or 8 years, when their preference for fairness becomes more engrained. Gummerum and colleagues (2008) assessed 9- to 17-year-olds' allocations. They also assessed participants' fairness preferences using a task in which participants hypothetically chose to either allocate more coins to themselves and fewer to another person, or equal quantities of coins between themselves and another person. Then participants rated how much they liked their hypothetical allocations. Participants of all ages who allocated 10 or more of their 20

coins to the recipient almost exclusively used fairness justifications as rationale for their generosity. Regression analyses revealed that participants' preference for fairness predicted their generosity – interestingly, age did not predict sharing. That is, participants who allocated more coins to the recipient also endorsed more statements related to fairness.

Children may behave fairly because they are interested in fairness itself; or, they may behave fairly due to an interest in *appearing* fair (Shaw et al, 2013). In a series of experiments, Shaw and colleagues (2013) tested 6- to 8-year-olds' interest in appearing generous. Children allocated erasers more fairly when their allocations were known to the experimenter, and were less fair when there was doubt as to whether the experimenter would know their allocations. In a separate experiment, Shaw and colleagues asked 6- to 11-year-old children to flip a coin in private to determine whether a good prize should be allocated to them or to a recipient. All children were more likely to keep the good prize for themselves than to give it to a recipient, although the older children were more likely to actually flip the coin. Together, these findings indicate that children may be motivated to behave in a way that seems fair or generous. Children might behave fairly because of their increased awareness that their generosity is associated with them, or due to children's increased interest in abiding by social expectations pertaining to fairness.

Indeed, children's awareness and expectations related to fairness may be linked to age. It seems that older children even prefer fair offers rather than offers that are advantageous to them. Another aspect of Fehr and colleagues' (2008) study was to test children's preferences for equal sharing across development. Among 3- to 8-year-olds, they tested *advantageous inequality*, which refers to unequal allocations that are more

favourable for the self, and *disadvantageous inequality*, which refers to unequal allocation that are more favourable for the other. On the one hand, results revealed that 3- and 4-year-olds preferred to keep more candies for themselves (i.e., advantageous inequality). On the other hand, 7- and 8-year-olds displayed a predilection for equal sharing between themselves and a recipient. Moreover, 7- and 8-year-olds also preferred fair allocations rather than allocations that either were disadvantageous (i.e., disadvantageous inequality) or advantageous (i.e., advantageous inequality). These findings that older, but not younger, children reject unequal distributions that are advantageous to themselves are supported by Blake and McAuliffe (2011). In Blake and McAuliffe's experiment, 4- to 8-year-olds sat across from an unfamiliar peer and chose to either pull a red handle to reject, or a green handle to accept distributions of candies between themselves and the unfamiliar peer. While participants of all ages rejected offers that were disadvantageous to them (i.e., more candies allocated to the peer than to the participant), only 8-year-olds rejected advantageous allocations (i.e., more candies allocated to themselves than to the peer). Taken together, older children are averse to inequality even if the inequality is advantageous to them.

Children have a propensity toward sharing and fairness early in childhood, even though fair sharing is not demonstrated until around age 7 or 8 years (e.g., Smith et al. 2013). These studies are helpful for making predictions that quite young children will likely share some of their resources but they are unlikely to share equally (e.g., Smith et al., 2013). Children's penchant for fairness likely means that they will predict that *others* will share fairly (even though they do not act in accordance with their own standards for fairness). This is relevant to the current work as some of the experiments in this

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dissertation asked children to make predictions about others' generosity.

1.4 Research on Prosociality and Anonymity

In this dissertation, children's anonymous prosocial behaviour was studied in order to (1) assess whether children understand anonymous sharing and (2) shed light on the effects of anonymity on children's prosocial behaviour. Studying anonymous sharing provides one way to empirically test whether theories of reciprocity and reputation (as discussed above) apply to children's prosocial behaviour because these motives cannot be applied in anonymous contexts. As described earlier, it can be advantageous for individuals' prosocial behaviour to be made known. For example, if a donor's sharing is made known to another party, then that party is likely to view the sharer in a positive light. However, prosocial acts that go unnoticed do not yield the same personal benefits. That is, someone who shares anonymously is no more likely to be seen in a positive light than if they had not shared at all.

There are various ways in which an individual may be anonymous. For instance, a prosocial behaviour may be completely anonymous, or a prosocial behaviour may be anonymous to some individuals and known to others. In this dissertation, children's sharing was manipulated such that their sharing was either anonymous or not to a recipient. Across conditions, the experimenter was always blind to donor's generosity so as to avoid children sharing for the purposes of social desirability. In this dissertation, children's sharing was tested in anonymous and identified contexts. If children's sharing differs in anonymous versus identified contexts, it suggests that children's rationale for sharing may be different in these two contexts. Differential sharing across anonymous and identified contexts provides insight into the motives underlying children's sharing. If

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the primary underlying mechanism of children's sharing is altruism, one would expect to see the same sharing in anonymous and non-anonymous contexts as the ultimate goal is to benefit another person. However, if there are strategic reasons for children's sharing (e.g., reputation, reciprocity), there is little motivation to share anonymously because the donor cannot benefit.

1.4.1 Adults' anonymous sharing. It is relevant to review adults' anonymous sharing as it informs us that strategic sharing is present in adulthood. Generally, the adult sharing literature indicates that adults typically opt to share something when given an opportunity to do so; however, their generosity tends to increase when they think they are being observed (e.g., Haley & Fessler, 2005) and when their generosity is made known to others (e.g., Hoffman, et al., 1994). Thus, at some point in development people choose to share strategically. By understanding adult sharing in various contexts it may help to predict children's sharing, and helps locate children's sharing within a developmental timeline. Furthermore, knowledge of adult sharing informs hypotheses about children's motivations for anonymous sharing.

The dictator game is a useful resource allocation paradigm for studying anonymous prosocial behaviour. Borrowed from the field of behavioural economics, the dictator game is a research paradigm used in psychology to measure how generously individuals share (Kahneman, Knetsch, & Thaler, 1986). Understanding how adults strategically share in a dictator game provides important information about anonymous sharing at this stage in development.

Studies with adults have demonstrated that adult participants typically share some of their resources in a dictator game. In Edele, Dziobek, and Keller's (2013) study,

undergraduate students could anonymously share zero to 20 coins with a recipient in a dictator game. Edele and colleagues were interested in how empathy affected participants' resource allocations. Using a battery of measures, participants' cognitive empathy (i.e., perspective-taking abilities and inferential skills) and affective empathy (i.e., asking participants how they felt upon viewing emotional evocative stimuli) were assessed. Although participants' offers were anonymous to the recipient, they were not private from the experimenter. Results showed that affective empathy, but not cognitive empathy, predicted adults' sharing behaviour in this dictator game. On average, adults shared approximately 30% of their money with a recipient. Nearly one third of participants split their money equally and only 11% kept all 20 coins for themselves. This study illustrates the amount of generosity that adults display when they are not identifiable to recipients, and demonstrates that the majority of adults chose to share something in the context of a dictator game.

Although adults have a tendency to share some resources rather than not share at all (e.g., Edele et al, 2013), they also share less generously in explicitly anonymous situations (e.g., Hoffman, et al., 1994). Hoffman and colleagues (1994) had participants complete two types of dictator games where (1) experimenters were present and (2) experimenters were not present in double-blind dictator games paradigms. They found that participants were less generosity when anonymous. In double-blind paradigms, participants divided $10, in private, while remaining anonymous to the recipient. When the participants were assured anonymity from recipients (and privacy from the experimenter), two thirds of participants chose to share nothing, and 84% of participants offered either $0 or only $1. Conversely, in non-double blind paradigms, only 20% of

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participants chose to share none of their money. Hoffman and colleague's results revealed that participants shared less generously when participants' offers were anonymous from the recipient and private from the experimenter compared to when experimenters were aware of participants' generosity.

Subtle manipulations of anonymity also influence adults' generosity. Anonymous adults shared less than adults who *thought* they were being observed (Haley & Fessler, 2005). In Haley and Fessler's (2005) study, undergraduates decided how much money to allocate to an anonymous partner in a dictator game with various experimental manipulations. One condition included implicit cues of being observed using two stylized eye-like shapes (i.e., eyespots); another condition included a skewed version of the eyespots; and the control condition did not include eyespots. Thus, while participants' allocations were always anonymous to the recipient, participants' donations may not have seemed completely unobserved. Participants allocated significantly more money when they were in the eyespot condition compared to the skewed eyespot condition. Participants shared significantly more money in eyespot versus no-eyespot conditions. Haley and Fessler concluded that even subtle cues of perceiving human eyes increased adults' generosity.

Taken together, the findings from the adult sharing literature suggest that adults share approximately 20-30% of their resources (e.g., Edele et al. 2013), and that their generosity is influenced by contextual factors, including the degree of anonymity afforded to individuals (Hoffman et al., 1994). Indeed, even implicit cues, such as eyespots increase adults' generosity (Haley & Fessler, 2005). Thus, adults allocate more resources when their generosity is known rather than anonymous.

1.4.2 Children's anonymous sharing. Theories and findings from the adult sharing literature help situate children's sharing behaviour within a research context and within the broader context of prosocial development across the lifespan. Although studies have shown that adults share differently in anonymous and non-anonymous contexts, little is known about whether children share differently when they are anonymous or non-anonymous donors. Anonymity has rarely been experimentally manipulated in child sharing experiments. Indeed, in experiments that manipulated anonymity, the effect of anonymity was rarely directly tested. Given that so little work has tested anonymous sharing in children, it remains challenging to make predictions about how anonymity might influence children's generosity.

Few studies have examined children's anonymous sharing, and those that have, have often failed to include control conditions where children shared in non-anonymous contexts and failed to directly test children's understanding of anonymity. For example, as previously described, Benenson and colleagues (2007) studied 4- to 9-year-olds' anonymous sticker sharing. They found increased generosity with age. However, although Benenson and colleagues reportedly "went to great lengths to ensure that the child understood that the child's decision was completely anonymous" (p.171; experimenters cover their eyes to afford privacy to the donors during their allocation decisions), children were not formally tested to assess if they understood that their allocations were anonymous. This is problematic given that children as young as 4 years old participated in this study and anonymity may have been a developmentally complex concept for young children to grasp. Although this study tested anonymous sharing, it is unclear if children understood anonymity in this paradigm. Moreover, although Benenson

et al.'s (2007) experiment *featured* anonymity, they did not include a non-anonymous

sharing condition to test for sharing differences across conditions. Similarly, Grunberg,

Maycock, and Anthony (1985) assessed children's sharing in an anonymous sharing

context. Using a naturalistic setting, over the course of four consecutive Halloweens,

children aged 3 to 16 years who were trick-or-treating were given candies as well as ten

pennies. Children then had an opportunity to donate pennies anonymously to UNICEF.

The donations were completely anonymous because recipients did not know who donated

money and no one observed the children donating. Findings indicated that 7- and 8-year-

olds shared less generously compared to younger and older children. Sharing means were

not reported; however, a published graph revealed that 3- to 6-year-olds, and 9- to 12-

year-olds shared approximately 7 or 8 pennies, meanwhile 7- and 8-year-olds shared

between 5 and 6 pennies. This provides evidence that, across development, children share

anonymously when given the opportunity. Unfortunately, there was no sharing condition

where children's UNICEF donations were not anonymous; therefore, anonymous and

non-anonymous types of sharing were not compared. Moreover, children's understanding

of anonymous sharing was not assessed.

Dreman and Greenbaum's (1973) experiment represents one of the few studies

that manipulated and assessed anonymity among children. In this study, 5-year-olds from

middle or lower socioeconomic backgrounds were offered seven candies. Children were

then told they could share their candies with another kindergartener who had not received

candies. Children were told that their candy sharing would either be anonymous (i.e.,

"s/he won't know who gave him/her candies because I won't tell") or identified (i.e., "I'll

tell him/her that you gave him/her candies"). Five-year-olds shared, on average, 3.32 (*SD*

= 1.47) of their 7 candies across both conditions. Dreman and Greenbaum were primarily

curious if children's sharing, which was categorized as 'generous' or 'non-generous',

would differ based on their socioeconomic status. They found that anonymity did not

affect sharing for lower class boys; however, boys from middle class socioeconomic

backgrounds were more likely to share generously in identified versus anonymous

sharing conditions. Anonymity did not affect sharing among girls in either socioeconomic

status groups. Based on a table published in their paper, it seemed that middle class girls

were more likely to share non-generously (regardless if they were in anonymous or

known conditions), whereas lower class boys and girls appeared to share randomly across

the anonymous and known conditions with a slight tendency to share non-generously.

Dreman and Greenbaum (1973) also examined self-reported reasons why children shared.

Participants were interviewed and verbal responses were coded, resulting in four

categories: (1) altruism: children wanted recipients to be happy; (2) social responsibility:

children felt obligated to share due to social norms; (3) in-group: children felt obligated

to help people they liked and they wanted to perpetuate friendship; (4) reciprocity:

children felt obligated to help to get possible future rewards, or because of immediate

services rendered. Results revealed that 95% of children reported sharing for reasons of

'altruism', 'social responsibility', or 'in-group'. Only 5% of children reported reciprocity

as a sharing motivation, which the authors concluded was due to the fact that participants

were only aged 5 to 6 years, and they may not have understood the sophisticated concept

of reciprocity.

 Leimgruber, Shaw, Santos, and Olson's (2012) work did not directly examine

anonymous sharing, but it did test children's sharing across different levels of privacy.

They found that 5-year-olds' shared more generously when their sharing was observed by a recipient, rather than when their sharing was unobserved by the recipient. In this paradigm, 5-year-olds shared in conditions where they were observed or not observed by a classmate who was the recipient of their allocations. In this study, participants were not truly anonymous because experimenters were present at all times to ensure the paradigm ran smoothly, even when participants sat across from recipient. However, participants' degree of privacy during resource allocation was also manipulated. Resources were allocated to the recipient using transparent or opaque containers. Recipients could see the amount of resources being shared with them in trials that used the transparent containers, but not in trials that used the opaque containers. As expected, children shared most generously when the least amount of privacy was afforded to participants. That is, children shared more generously when participants were observed by recipients, and when resources were allocated using transparent containers. On the other hand, children shared less when their offers were not directly visible and when their allocations were private in opaque containers. Indeed, the fact that children shared more generously when their donations were more observable suggests that, like adults, children's underlying motives for sharing may be to *appear* generous. It seems that children may use generous sharing as a way to manage their reputation (e.g., Leimgruber et al., 2012) and enhance their chance of future reciprocity (e.g., Dreman & Greenbaum, 1973). However, this notion is based on limited evidence.

Understanding anonymity necessitates that children comprehend that their actions will not be associated with them (i.e., their actions are separate from other people's knowledge). To do so, *Theory of Mind* (ToM; Premack & Woodruff, 1978) abilities

should be present. ToM refers to individuals' ability to understand their own and others' mental states (e.g., thoughts, feelings, desires), that these are private, and that individuals act on the basis of their own mental states. Indeed, the development of these cognitive skills has been described as critical for social interactions (e.g., Sinclair, 1996), which is particularly interesting given that one of the aims of this dissertation is to better understanding whether children consider social payoffs (e.g., reputation management) when sharing anonymously. As Moore (2006) noted, during the preschool years considerable gains are made in commonsense psychology (e.g., the understanding that the self and other are separate psychological entities with their own subjective experiences). Moore also commented that, by around age 4 years, preschoolers can disentangle their own perspective from others' perspectives and their social actions begin to reflect this ability to understand diverse perspectives; this is around the same time (between ages 3 and 5 years) that children develop cognitive abilities that are captured under the ToM umbrella term.

One measure of ToM includes knowledge-ignorance tasks, which have been used to distinguish what children know from what they do not know. Interestingly, 3-year-olds in Wellman and Liu's (2004) study, failed their investigator-created knowledge-ignorance task, which assessed children's understanding of other people's knowledge. This is not especially surprising given that 3-year-olds have been shown to fail tasks that ask them to assess another person's knowledge (e.g., 3-year-olds failed such a task in Wellman and Woolley's [1990] study). Thus, by the age of 3, while children have developed a variety of important psycho-social, cognitive skills, it is unclear if children as young as 3 years old understand something like anonymous actions (i.e., anonymous

actions are behaviours that others do not know about and cannot be linked to the anonymous agent). The current work tests 3- and 5-year-olds' understanding of anonymous sharing.

It is important to test whether or not children understand anonymity given that children as young as 3 years of age have participated in experimental paradigms featuring anonymity (e.g., Grunberg et al., 1985). By including 3-year-olds, the current work may be compared to other studies that have tested children this young. Moreover, this is the lower age range in which children could cope with the task demands of the experimental paradigms used in the dissertation. By age 5, developmentally, children ought to have a clearer understanding of anonymity based on their cognitive development and thus, this age group is included as the upper age range for comparison purposes (e.g., Hala and Russell [2001] noted that, by age 5, typically developing children should have developed cognitive abilities that allow them to consider strategic actions). That is, compared to 3-year-olds, 5-year-olds should have the cognitive flexibility to think about strategically sharing less as anonymous donors for the purposes of personal gain.

If young children understand anonymity and strategic sharing, they ought to share differently in anonymous and identified contexts given that they should recognize the potential outcomes of sharing in both contexts (Singer & Fehr, 2005). If children do not understand anonymity, or if they do not care about strategic motives, such as reputation or reciprocity, presumably they will not share differently in anonymous versus identified contexts. For this reason, it is critical to assess understanding of anonymity independently from sharing motives. Otherwise, if children do not have a clear understanding of anonymity and they are tested in paradigms featuring anonymity, researchers might draw

the wrong conclusions (e.g., incorrect conclusions from a lack of differential sharing, or incorrect conclusions based on results yielded from children who participated in studies they did not understand).

In addition to the prediction that children would share differently as anonymous and identified donors, children could also have preferences about sharing in an anonymous or identified fashion. As reviewed above, children have been shown to demonstrate preferences that influence their sharing (e.g., children's preference for fairness often results in children sharing equally; Fehr et al., 2008). Children may also display preferences to share as either anonymous or identified donors. Based on the theories of reputation and reciprocity discussed above, anonymous donors ought to be stingier than identified donors. Therefore, children may prefer to share as anonymous donors themselves in order to share ungenerously without anyone knowing of their stinginess. Additionally, if children believe that identified donors are generous, children may prefer to receive from identified donors who may be deemed more apt to share generously in an effort to improve their reputation and chance of reciprocity. Thus, examining children's preferences to share and receive in anonymous or identified ways provides a unique way of indirectly tapping into children's understanding and motivations about anonymous sharing.

1.5 Current Work

The goals of this dissertation were to test whether children understood anonymity, to examine whether anonymity influenced children's generosity, and to test whether children had a preference for sharing anonymously or not. Anonymity is interesting to study because it sheds light on sharing motives of reputation and reciprocity given that

these motives cannot be applied in anonymous sharing contexts. Given the paucity of research in the domain of anonymous sharing, the aim of the current work was to manipulate anonymity in order to gauge if children understand anonymous sharing and to assess whether children share differently in anonymous and non-anonymous contexts.

Thus, the experiments in this dissertation directly tested children's understanding of anonymity independent of whether or not children preferred to share anonymously, with the goal of indirectly assessing children's motives for sharing. To test this, children's understanding of anonymous sharing was assessed, and their sharing was analyzed separately in a dictator game. The dictator game is a useful paradigm to use because it is possible to manipulate participants' anonymity. Thus, three of the four experiments in this dissertation used paradigms involving the dictator game.

The developmental questions of interest are: (1) do young children understand anonymity and (2) does anonymity impact generosity in early childhood? As an alternate way to assess children's understanding of anonymous sharing, this program of research assessed whether children preferred to share as, and receive from donors who are anonymous or identified. By assessing these sharing and receiving preferences, it was possible to test whether children predicted that anonymous donors were generous or not. Together, this allowed us to consider underlying factors that might contribute to children's prosocial behaviour and examine the effect of anonymity.

Experiment 1 goals. The goals of the first experiment were to design a task that could be used to assess whether young children understood anonymity and, subsequently, test if anonymity influenced children's generosity. These goals were accomplished by

giving children an opportunity to share stickers in a dictator paradigm as either an anonymous or an identified donor.

Experiment 2 goals. One goal of the second experiment was to improve upon methodological shortcomings of the first study in order to be more confident in the assessment of children's understanding of anonymity. A second aim of Experiment 2 was again to test whether anonymity influenced children's sharing.

Experiment 3 goals. One goal of the third experiment was to analyze whether children preferred to receive from anonymous or identified donors. This experiment did not use a dictator game. Rather than allocating stickers, participants were asked to participate in the role of the recipient and predict how many stickers they anticipated anonymous and identified donors might allocate to them.

Experiment 4 goals. The goals of the fourth experiment were to test whether children preferred to share as anonymous or identified donors and whether this preference corresponded to differences in sharing. Additionally, Experiment 4 replicated Experiment 3 with the goal of increasing confidence in the findings pertaining to children's receiving preferences.

Chapter 2: Experiment 1

2.1 Rationale

Research has shown that adult donors share less when they are anonymous (e.g., Haley & Fessler, 2005); but little research has assessed this phenomenon among young children. Learning about children's anonymous sharing helps to provide insight into their motivations for prosocial behaviour; this is helpful for better understanding prosociality across development. One goal of Experiment 1 (E1) was to assess if children shared different amounts of resources as anonymous or identified donors. Another goal of E1 was to independently test if young children understood what it means to be anonymous; specifically, whether young children understood anonymous sharing independent of their willingness to share. Independently assessing children's understanding of anonymous sharing is particularly important given that past research that included anonymity (e.g., Grunberg et al., 1985) primarily aimed to assess children's sharing in anonymous contexts without separately testing children's understanding of anonymity. Thus, E1 provided important contributions to the study of children's anonymous sharing by first directly testing children's *understanding* of anonymous sharing, and then testing the impact of anonymity on children's generosity.

Children of ages 3 and 5 were recruited for E1. Three-year-olds were included as the lower age range given that previous studies have included children as young as 3 in paradigms featuring anonymity (e.g., Grunberg et al., 1985). Five-year-olds were recruited for the upper age range because children at this age demonstrate that they are capable of understanding diverse perspectives (i.e., their own and others; e.g., Moore, 2006); thus, it is a reasonable age to test if children also understand whether or not others

are aware of their anonymous actions. Additionally, between these two ages there are interesting changes in social and emotional development, which may affect children's sharing. For example, compared to younger children, around age 5 years, children have more opportunities for social interactions through their classroom environments. Indeed, children begin to hone sophisticated social skills, from demonstrating empathy toward peers in the preschool years to displaying prosocial skills based on peers' emotional state in the early school years (e.g., Saarni, 2011). Given the socio-emotional and cognitive developments that occur between ages 3 and 5, these age groups were tested in order to assess developmental changes in anonymous sharing behaviour across this timeframe.

In order to test whether children understand anonymous sharing, participants were randomly assigned to share as anonymous or identified donors, and then were asked whether or not recipients would know who shared with them. It was predicted that 5-year-olds would understand anonymous sharing. This was based on the fact that typically developing 5-year-olds have well-developed theory of mind capabilities, which are cognitive abilities that assist participants in understanding what they know versus what others know in an anonymous sharing paradigm (e.g., Astington & Edward, 2010). By age 5 years, children recognize that they have thoughts and beliefs that can differ from others' thoughts and beliefs and that people act in accordance with their mental states. So, 5-year-olds are capable of understanding that if they do something privately (e.g., share stickers anonymously) no one else will be aware of their actions. Meanwhile, it was predicted that 3-year-olds would not understand anonymous sharing based on the fact that at this age, children are still developing the ability to understand that other people's thoughts and belief differ from their own and that these differences impact people's

behaviour (e.g., Moore, 2006, Astington & Edward, 2010). For example, if a 3-year-old shares stickers with someone else, they may believe that everyone knows that they shared simply because they, personally, have this knowledge (i.e., *If I know it, everyone knows it too*). Thus 3-year-olds' immature cognitive abilities may not impede their ability to complete a task that assesses their understanding of *identified* sharing, but their developmental stage may hinder their performance on a task that assesses their understanding of *anonymous* sharing.

In terms of sharing, given that previous resource allocation research with adults has shown that adults are stingier when they are anonymous versus when they are not anonymous (e.g., Haley & Fessler, 2005), a dictator game was used to test the hypothesis that children would share less in anonymous sharing conditions than in identified sharing conditions. Specifically, it was predicted that 3-year-olds would share similarly across anonymous and identified sharing conditions (given that it was predicted that 3-year-olds would not understand anonymous sharing and therefore would not demonstrate differential sharing across condition). Conversely, it was hypothesized that 5-year-olds would share more generously as identified than as anonymous donors. This hypothesis was based on the prediction that 5-year-olds would understand anonymous sharing, and would share differently across conditions given Leimgruber, et al.'s (2012) research showed that 5-year-olds are interested in being associated with generosity. In Leimgruber and colleague's study, participants shared more generously when their sharing was observed than when it was not observed. Although neither the experimenter nor the fictitious recipient in the current study observed children's actions, generosity was manipulated in E1 such that sharing was either associated with participants (i.e.,

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identified sharing condition) or not associated with them (i.e., anonymous sharing condition). Given that Leimgruber and colleagues suggest that children want to be associated with their generosity, it was hypothesized that children whose sharing behaviour was associated with them in identified sharing conditions would behave more generously than those whose sharing behaviour was not associated with them in anonymous sharing conditions.

2.2 Method

 2.2.1 Participants. Eighty-nine participants were recruited from Nova Scotia, Canada. Recruitment was conducted by contacting parents included in a database of parents interested in having their child participate in developmental psychology research. Of these participants, 67 were retained for analyses ($n = 32$ girls, $n = 35$ boys). Six early participants were excluded because they had a pilot protocol administered to them, which was subsequently modified; nine participants were excluded because they were unable to complete testing; five participants were excluded because they did not allocate all ten stickers to themselves or a recipient (e.g., some children kept stickers for a third party); and two were excluded because they were not typically developing. Of the final 67 participants retained, 36 were 3-year-olds ($M_{age} = 48$ months; $n = 13$ girls) and 31 were 5-year-olds ($M_{age} = 55$ months; $n = 16$ girls). Participants were randomly assigned to an Anonymous ($n = 37$; 3-year-olds $n = 20$; 5-year-olds $n = 17$) or an Identified Sharing condition ($n = 30$; 3-year-olds $n = 16$; 5-year-olds $n = 14$).

 2.2.2 Procedure. In this paradigm, participants received windfall resources and then had an opportunity to share with a fictitious child. Subsequently, participants learned how to share in an anonymous or identified fashion using envelopes. Then, participants'

understanding of anonymous and identified sharing was assessed and their sharing generosity was examined. Participants were tested individually in a laboratory setting. Participants believed they were brought into the laboratory to help the experimenter identify toys from an array that children would enjoy using. Within the selection of toys, the experimenter had planted 10 similar looking stickers in a clear bag (e.g., 10 owl stickers in different colours). Stickers were used as the sharing resource because stickers are highly motivating for, and valued by, young children (e.g., Prencipe & Zelazo, 2005).

Upon discovery of the planted stickers, participants were informed that they could keep the stickers because they had the good luck of finding them. Participants were then presented a blank envelope to put their stickers in to take home. Participants' names were printed on their envelope. Then, participants were introduced to a sharing opportunity with a child named Casey[1].

Participants were told that they could share their stickers with Casey, who had been scheduled to visit the laboratory that day. Participants heard the following script, "If you want to, you can share your stickers with another child, Casey, who didn't get to come into the lab today. You could mail Casey however many stickers you want. You can share some of the stickers, all of the stickers, or none of the stickers." Then, the experimenter showed participants another blank envelope and printed Casey's name and mailing address on the envelope. Some deception was involved in this paradigm as participants were informed that the envelope would be mailed to Casey's home (see Figure 2.1).

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[1] The name 'Casey' was chosen because it is a relatively uncommon, gender-neutral name according to name websites such as www.babycenter.com.

Then participants were taught how they could share as anonymous or identified donors with Casey using two types of envelopes. Three-year-old participants heard the following script, "If Casey gets an envelope that says, from [*participant's name*], Casey would know this envelope is from you, right?" Scripts for 3-year-olds included a question that prompted participants to clarify whether or not they understood the paradigm so that the experimenter could ascertain whether 3-year-olds understood the significance of having their name printed on an envelope. Generally, participants agreed that Casey would know the envelope was from them. Any confusion or disagreement was followed by an explanation of how Casey would know that the envelope was from the participant. Five-year-old participants heard the following script, "I'm going to write [*participant's name*] on the envelope. So Casey will know this envelope is from you." Unlike scripts for 3-year-olds, the scripts for 5-year-olds did not include a question that asked children to confirm whether or not they understood the relevance of having their name printed on an envelope. This question was not included in the script for older children as it was predicted that 5-year-olds would understand that having their name printed on an envelope would mean Casey would know it was from them.

Subsequently, participants were shown a third envelope, which was addressed to Casey. This time, 3-year-olds heard a different script, "What if I have an envelope for Casey that does *not* say it's from you? If Casey gets this envelope that does not say, from [*participant's name*], Casey would *not* know this envelope is from you, right? Again, often participants agreed that Casey could not know the envelope was from the participant if their name was not written on it. Any confusion or disagreement was followed by an explanation of how Casey would not know that the envelope was from the

participant. Five-year-old participants heard the following script, "I'm not going to write [*participant's name*] on the envelope. So Casey will *not* know this envelope is from you."

Then, all participants were taken to a pretend mailbox. Three-year-olds were once again asked if Casey would know who the envelope was sent from. Corrective feedback was provided if participants answered incorrectly. See Appendices A and B for complete protocols.

Depending on the condition to which participants were randomly assigned, the experimenter held up either the envelope that said it was from the participant (i.e., the Identified Envelope) or the envelope without the participant's name on it (i.e., the Anonymous Envelope). Then the experimenter said, "Let's give Casey this envelope!" By selecting one envelope, participants were assigned to share anonymously or not.

Then participants' understanding of anonymous sharing was examined. To assess whether participants understood anonymity, the experimenter held up Casey's envelope, which included the participant's name (if they were randomly assigned to the Identified Sharing condition), or did not include the participant's name (if they were randomly assigned to the Anonymous Sharing condition). Participants were asked, "If you put stickers in this envelope, will Casey know the stickers are from you?" If participants answered this question incorrectly, they were scored as "not understanding anonymous sharing". If participants answered correctly, they were scored as "understanding anonymous sharing".

Next, all participants were given an opportunity to share their stickers with Casey, without the experimenter observing them. The experimenter demonstrated how to allocate stickers so that stickers would either be shared with Casey, or kept for

themselves. Participants were informed that "you get to choose if you want to share stickers, or keep stickers", and were led into a private partitioned section of the room where they could not be directly observed. After reminding participants that they could share "some stickers, all of the stickers, or no stickers", they were informed that the envelope would be mailed to Casey "no matter what [they] decide[d]". Sticker sharing data was only analyzed from participants who correctly answered the anonymous sharing question.

A video camera recorded participants' behaviour. Behind the partition, participants allocated stickers to themselves by putting stickers in their own envelope, or shared stickers with Casey by putting stickers in Casey's envelope. After all 10 stickers had been allocated into envelopes, participants "mailed" the envelope to Casey using an experimenter-created mailbox (see Figure 2.1). Occasionally, participants asked how the envelope would be delivered to Casey; the experimenter replied generically that all of the mail would be collected from the university and would be delivered using the address written on the envelopes.

2.3 Results

    2.3.1 Understanding anonymity. Binomial tests were used to examine if participants correctly identified whether or not Casey would know that stickers came from them based on whether an envelope included the participant's name. Participants' 'yes' or 'no' answers to whether Casey would know that the stickers were from the participants were used as a measure of whether participants understood how to share as anonymous or identified donors. In total, 57 of 67 participants (85%) provided the

correct answer, indicating that they understood how to share stickers as anonymous or identified donors (binomial test, $p < .001$).

To better understand 3- and 5-year-olds' understanding in both Anonymous and Identified Sharing conditions, log-linear analysis was used to compare participants' understanding of anonymity (based on their verbal response) across age groups and sharing conditions. Two of the expected frequency cell counts were less than one, which violated the assumption of log-linear analysis that all expected frequencies are greater than one (Tabahnich & Fidell, 2007), the consequence of which, is a loss of power. Nonetheless, statistically significant findings were detected.

The three-way log-linear analysis produced a final model that retained a higher-order two-way interaction. The likelihood ratio of this model indicated that a two-way interaction was significant, $K = 2$; $\chi^2 (4) = 15.13$, $p = .004$. This analysis revealed that the Age X Understanding Anonymity interaction was the significant finding, $\chi^2 (1) = 14.06$, $p < .001$ (see Table 2.1). For 5-year-olds, there was a significant association between age and their understanding of the task, such that all 5-year-olds provided the correct verbal response, indicating that they understood anonymous sharing. Examining the counts, the pattern was less reliable for 3-year-olds. That is, 26 of the 36 (72%) of 3-year-olds provided the correct verbal response. Taken together, these results indicated that 3-year-olds' ability to succeed in this task was less developed compared to the 5-year-olds, irrespective of condition. It was hypothesized that 5-year-olds, but not 3-year-olds would provide the correct answer in a task that assessed their understanding of anonymous sharing. The results supported this hypothesis given that 5-year-olds reliably understood

anonymous and identified sharing (based on task performance), whereas 3-year-olds'
understanding was above chance, but still developing.

2.3.2 Sticker sharing. To test the hypothesis that 5-year-olds, but not 3-year-olds,
would share less as anonymous donors compared to identified donors, a 2 (Age) X 2
(Sharing condition) univariate analysis of variance (ANOVA; α = .05) with the Number
of Stickers Shared as the dependent variable was conducted (see Figure 2.2). Sixty-seven
participants completed this paradigm, of whom, 57 correctly answered the question that
tested their understanding of anonymous sharing. The 10 who did not understand
anonymous sharing were excluded from the following sticker sharing analyses because
their sticker sharing was not affected by the experimental manipulation (i.e., these
children were essentially sharing stickers randomly given that they did not understand
how to differentiate between anonymous and identified donors). The goal was to test for
sharing differences across anonymous and identified donor, therefore it was critical to
ensure that the data retained for analyses came from children who understood anonymous
sharing. This resulted in unequal sample sizes in the Identified Sharing condition *(n = 27)*
and the Anonymous Sharing condition (*n* = 30). A Levene's Test revealed that the
assumption of homogeneity of variance was met despite unequal samples (Levene's Test
$F(3, 53) = 1.53$, $p = .218$); therefore, the following results were interpreted with
confidence. Effect sizes are reported using Cohen's *d*. Overall, the mean number of
stickers shared was 4.30 (*SD* = 2.56) out of 10.

Results from the ANOVA revealed no main effect of Age (*F1*[1, 53] = 0.01, *p* =
.924, *d* = 0.027). The number of stickers shared by 3-year-olds (*M* = 4.35, *SD* = 3.08) was
very similar to the number shared by 5-year-olds (*M* = 4.28, *SD* = 2.06). Likewise, there

was no main effect of Sharing condition (F[1, 53] = 0.08, p = .772, d = 0.077), such that sharing was not influenced by whether participants were anonymous (M = 4.41, SD = 2.43 stickers shared) or identified donors (M = 4.21, SD = 2.74 stickers shared). Finally, counter to the hypothesis, Age and Sharing condition did not interact to influence the Number of Stickers Shared (F[1, 53] = 0.86, p = .358; see Figure 2.2).

2.4 Discussion

Although, overall children appeared to understand anonymous sharing, upon closer examination, 3-year-olds were less likely to respond correctly compared to the 5-year-olds. In order to successfully complete the task, children needed to understand that having their name printed on an envelope conveyed information (i.e., Casey will know who the stickers are from); and a *lack* of information (i.e., *not* having participants' names printed on an envelope) conveyed information (i.e., Casey will *not* know who the stickers are from). Three-year-olds' understanding was less developed than 5-year-olds, who displayed reliable understanding of anonymity based on their correct task performance.

The current findings lent support to the hypothesis that 3-year-olds would not understand anonymous sharing, but 5-year-olds would. Indeed, the current results suggest that previous studies that assessed 3-year-olds using paradigms that featured anonymity should be interpreted cautiously, especially if past studies did not independently assess children's understanding of the anonymous sharing paradigm. For example, Grunberg, et al. (1985) examined anonymous penny donations on Halloween among children aged 3 years and older. While children as young as 3-years-old *may* have understood how to share anonymously, the current findings suggest that children's understanding of anonymous sharing should not be assumed at this stage of development.

The findings from E1 did not indicate that participants' generosity was influenced by whether they shared as anonymous or identified donors. This was counter to the hypothesis that, at least among 5-year-olds, less sharing would be observed in the anonymous condition compared to the identified condition. It was surprising that, in this context, anonymity did not affect children's sharing given that past work has shown that children's sharing is influenced by various factors. For instance, 4-year-olds share more with friends than with non-friends or strangers (Moore, 2009) and 3-year-olds share more with in-group than out-group members (Fehr et al., 2008). With cueing, even toddlers engage in contextually appropriate prosocial responses (Dunfield et al., 2010), and by age 5 years, without prompting, children share more when a recipient is poor than when the recipient is wealthy (Paulus, 2014). Thus, children of similar ages to the ones tested in this experiment have been shown to be capable of sharing differentially based on the sharing context.

Despite the fact that anonymity influences sharing at some point in development, as evidenced by the fact that adults share less generously when they are anonymous, anonymity may not influence young children's decisions about generosity. Thus, while children display motivation to share with in-group members, friends, and those in need, children do not appear to be motivated to share less as anonymous donors. Although children cognitively understand anonymous sharing, perhaps they cannot yet conceptualize why it may be prudent to share differently in both sharing contexts. By sharing similarly as anonymous and identified donors, this might suggest that children cannot, or do not, yet consider sharing strategically (e.g., in order to enhance their reputation or improve their changes of future reciprocity).

2.5 Limitations & Future Directions

This paradigm was created to assess if young children understand anonymous sharing. These results were interpreted as preliminary findings, on the basis that aspects of the paradigm that assessed children's understanding of anonymous sharing would benefit from modifications. For example, the paradigm in E1 lacked counterbalanced conditions regarding the order in which information was presented to participants. Specifically, all participants in E1 were *first* taught how to share as an identified donor, and *then* taught how to share as an anonymous donor. As a result of this order, a participant who was randomly assigned to an Anonymous Sharing condition heard how to share anonymously immediately before being asked if they knew which envelope to select to be an anonymous sharer, whereas a participant who was randomly assigned to an Identified Sharing condition heard a protocol that most recently described how to share anonymously before asking them if they knew which envelope to select to be an identified sharer. To ensure that participants' answers were not unduly influenced by the more recent information they heard in the protocol, subsequent protocols used counterbalanced conditions such that how to share as an anonymous and identified donor was explained in counterbalanced order.

Additionally, this paradigm relied on children's verbal responses to test whether they understood anonymous sharing. Verbal demands can be unreliable and difficult to obtain from young children. Therefore, the protocol in the next experiment reduced verbal demands by asking children to physically select an appropriate envelope. Also, the subsequent protocol was be more simplistic in an effort to increase task completion. This

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was accomplished by omitting the component of 'mailing the envelope to Casey', which decreased the level of abstractness of the protocol.

Finally, and on a more general note of improvement for future paradigms, different protocols were used for 3- and 5-year-olds in E1. Specifically, 3-year-olds' protocols had more detailed scripts, including a teaching aspect to help ensure that they understood the significance of having a name printed on the envelope. This was done to maximize 3-year-olds' understanding so that the groups could be compared in terms of their sharing amounts. However, by scaffolding younger children's performance, the different protocols likely served to underestimate potential differences in understanding of anonymity between the age groups. The next experiment aimed to replicate findings from E1 using the same protocols (without a teaching component) for both 3- and 5-year-olds to allow for clearer comparisons across age groups in assessing their understanding of anonymity.

Chapter 3: Experiment 2

3.1 Rationale

The goals of Experiment 2 (E2) were essentially the same as the goals of E1. Like E1, E2 sought to investigate whether 3- and 5-year-olds understood anonymous sharing; in E2 a revised dictator game paradigm was created. The second goal of E2 was to assess the influence of anonymity on children's sharing. E1 used different protocols for both age groups, such that 3-year-olds' heard scripts that included information about the relevance of having their name printed, or not printed on an envelope. Conversely, the protocols in E2 were the same for both 3- and 5-year-olds, and did not include information highlighting the relevance of having participants' names printed on the envelopes. It was hypothesized that, due to the revised E2 protocols, only 5-year-olds would select the correct envelope. That is, it was hypothesized that 3-year-olds would not select the correct envelope as the script did not provide cues to assist their understanding that having their name printed on the envelope rendered their donation identified, and that not having their name printed on the envelope rendered their donation anonymous (see section 3.2.2 for the procedure). Given that it was hypothesized that only 5-year-olds would understand anonymous sharing, it was hypothesized that 5-year-olds, but not 3-year-olds, would share less as anonymous donors than as identified donors.

3.2 Method

3.2.1 Participants. Eighty-three participants ($n = 44$ girls) were recruited from Nova Scotia, Canada. Recruitment was conducted by contacting parents who were listed on a database, which indicated that they were interested in having their child participate in developmental psychology research. Fifteen participants were excluded: eight were practice participants for an undergraduate student who was responsible for running 48

participants as part of her honours thesis, five participants did not complete the task, and two were excluded due to experimenter error. Of the 68 participants retained for analyses, 40 were 3-year-olds ($M = 39$ months; $n = 20$ girls) and 28 were 5-year-olds ($M = 63$ months; $n = 14$ girls). At each age, an equal number of participants were assigned to Anonymous ($n = 34$; 3-year-olds $n = 20$; 5-year-olds $n = 14$), and Identified Sharing conditions ($n = 34$; 3-year-olds $n = 20$; 5-year-olds $n = 14$).

3.2.2 Procedure. As for E1, participants had an opportunity to share windfall resources with a fictitious child named Casey. The overall approach for testing participants' understanding of anonymous sharing and for testing whether anonymity influenced participants' sharing was the same as described in E1 (e.g., participants were tested individually in the laboratory, participants discovered 10 planted stickers, etc.). See Appendices C and D for protocols.

The participant's name was printed on a blank envelope and the experimenter informed the participant that they could put their stickers in the envelope to take them home. Then, participants were introduced to a sharing opportunity with Casey. Participants heard the following script, "If you want to, you can share your stickers with another child, Casey, who didn't get to come into the lab today. You could mail Casey however many stickers you want. You can share some of the stickers, all of the stickers, or none of the stickers."

Then, the experimenter showed participants two more blank envelopes and printed "*To Casey*" on both. The experimenter printed the participant's name on one of the envelopes, "*From [participant's name]*. To help ensure that the participants understood that their name was on the envelope, the experimenter explained that she was

putting the participant's name on one of the envelopes as she printed the participant's name. On the other envelope, the experimenter did not include the participant's name, and the experimenter highlighted that she was not going to print the participant's name on this envelope. Depending on the condition to which participants were assigned, participants heard scripts prompting them to share as either anonymous donors (i.e., *We do not want Casey to know the stickers are from you. So, which envelope do we use so that Casey does* not *know the stickers are from you*?) or identified donors (i.e., *We want Casey to know the stickers are from you. So, which envelope do we use so that Casey knows the stickers are from you*?). After hearing the script that prompted participants to share as anonymous or identified donors, participants were asked whether they should use the envelope with or without the participant's name to give to Casey. Envelope selection was recorded and was used to indicate whether participants understood how to make themselves anonymous or identified donors.

Irrespective of whether participants selected the correct envelope according to the script they heard, all participants proceeded to distribute their stickers, using the envelope they selected. Akin to E1, participants were shown how to allocate stickers using the envelopes. Participants allocated stickers in a private booth, without the experimenter observing them in an attempt to decrease the likelihood of participants behaving in a socially desirable manner.

3.3 Results

3.3.1 Understanding anonymity. It was hypothesized that 5-year-olds, but not 3-year-olds would correctly perform the task (i.e., select the appropriate envelope for their sharing condition), thereby demonstrating an understanding of anonymous sharing. An

overall binomial test revealed that participants selected the correct envelope to make themselves anonymous or identified donors at above chance levels (binomial test, $p <$ .001). That is, 75% (51 of 68 participants) correctly performed the task that assessed their understanding of anonymous and identified sharing.

To better understand 3- and 5-year-olds' understanding in both Anonymous and Identified Sharing conditions, log-linear analysis was used to compare participants' envelope selection (i.e., their understanding) across age groups and sharing conditions. One of the expected frequency cell counts fell below one (see Table 3.1), which violated the assumption of log-linear analysis (Tabahnich & Fidell, 2007), the consequence of which is a loss of power. Nonetheless, statistically significant findings were detected.

The three-way log-linear analysis produced a final model that retained all effects. The likelihood ratio of this model indicated that the highest-order interaction (Age X Sharing condition X Envelope Selection) was significant, $K = 3$; $\chi^2(1) = 4.26$, $p = .039$. To break down this interaction, separate chi-square tests split by Sharing condition and Age were conducted separately to understand which variables influenced children's Envelope Selection.

First, a follow-up chi-square looked separately at 3- and 5-year-olds. Findings indicated that, among 3-year-olds, there was no significant difference between Envelope Selection in the Anonymous Sharing condition (13 out of 20 selected the correct envelope) compared to 3-year-olds' Envelope Selection in the Identified Sharing condition (14 out of 20 selected the correct envelope), $\chi^2(1) = 0.11$, $p = .736$. However, there was a significant difference in terms of 5-year-olds' envelope selection across conditions. Specifically, all 5-year-olds selected the correct envelope in the Identified

Sharing condition, whereas 10 out of 14 selected the correct envelope in the Anonymous Sharing condition, $\chi^2(1) = 4.67$, $p = .031$. Given that the chi-square test among 5-year-olds was significant, 5-year-olds' task performance was analyzed with follow-up binomials. Binomial tests showed that 5-year-olds did not select the correct envelope reliably above-chance in the Anonymous Sharing condition ($p = .180$), but they did in the Identified Sharing condition ($p < .001$).

Another way to understand the three-way interaction is to examine Envelope Selection by looking at both Sharing conditions separately. Follow-up chi-square tests revealed that there was no significant difference in children's Envelope Selection in the Anonymous Sharing condition, $\chi^2(1) = 0.16$, $p = .693$. Specifically, 13 out of 20 3-year-olds selected the correct envelope, and 10 out of 14 5-year-olds selected the correct envelope in the Anonymous Sharing condition. Conversely, chi-square tests revealed a significant difference in the Identified Sharing condition, $\chi^2(1) = 5.10$, $p = .024$. That is, in the Identified Sharing condition, significantly more 5-year-olds selected the correct envelope (100%) compared to 3-year-olds (14 out of 20 selected the correct envelope). Given that the chi-square test that examined Envelope Selection in the Identified Sharing condition was significant, it was followed-up with binomial tests. Binomial tests revealed that, in the Identified Sharing condition, 3-year-olds did not select the correct envelope reliably above-chance ($p = .115$), but 5-year-olds did ($p < .001$; see Table 3.2 for a breakdown of envelope selection across ages and sharing conditions across E1 and E2).

The findings from E2 differed somewhat from E1 insofar as the best model fit in E2 included a three-way (Age X Sharing condition X Envelope Selection) interaction, whereas the best model fit in E1 included a two-way (Age X Understanding Anonymity)

interaction. The analyses for E2 suggested 5-year-olds' performance on a task that assessed their understanding of identified sharing (i.e., the Identified Sharing condition) was perfect. Conversely, 5-year-olds performance on a task that assessed their understanding of anonymous sharing was not reliable; 3-year-olds also failed to reliably succeed in a task that assessed their understanding of anonymous sharing. Moreover, 3-year-olds' performance on the Identified Sharing condition was significantly worse than 5-year-olds'. Thus, all children are developing an understanding of anonymous and identified sharing, however, 3-year-olds' understanding of identified sharing was notably more fragile than 5-year-olds. Compared to understanding identified sharing, understanding anonymous sharing appeared more difficult. Nonetheless, 72% of 5-year olds and 65% of 3-year-olds understood anonymous sharing, indicating that this understanding has certainly begun to emerge at this point in development.

The current results are in line with the hypothesis that 3-year-olds' understanding of anonymous and identified sharing is still developing given that 65% and 70% of 3-year-olds answered correctly in Anonymous and Identified Sharing conditions, respectively. Also in line with the hypothesis, 5-year-olds reliably understand the task, but only in the identified condition. These findings are cautiously interpreted given that the assumption of the original log-linear analysis was violated.

3.3.2 Sticker sharing. It was hypothesized that 5-year-olds would share less as anonymous donors than as identified donors, but that there would be no sharing differences across conditions among 3-year-olds. Participants who selected the incorrect envelope were excluded from the following analyses because they did not understand how to share anonymously and therefore did not understand the paradigm to participate

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in it meaningfully. Excluding these participants resulted in unequal sample sizes across conditions (N = 51); however, a Levene's Test revealed that the assumption of homogeneity of variance was met (Levene's Test $F(3, 47)$ = 1.11, p = .355). Therefore, the following results were interpreted with confidence.

A between-participants 2 (Age) X 2 (Sharing condition) univariate analysis of variance (ANOVA; α = .05) was conducted on the Number of Stickers Shared with Casey. Effect sizes are reported using Cohen's d. Overall, the mean number of stickers shared was 3.51 (SD = 2.70) out of 10 stickers.

Results revealed that the number of stickers shared by 3-year-olds (M = 3.59, SD = 2.72) was similar to the number shared by 5-year-olds (M = 3.42, SD = 2.73; $F[1, 47]$ = 0.05, p = .817, d = 0.062). Likewise, there was no main effect of Sharing condition ($F[1, 47]$ = 0.23, p = .635, d = 0.138) indicating that participants' sharing was similar whether they were anonymous (M = 3.30, SD = 2.43) or identified donors (M = 3.68, SD = 3.04). Finally, counter to the hypothesis, Age and Sharing condition did not interact to influence the Number of Stickers Shared ($F[1, 47]$ = 0.05, p = .825; see Figure 3.1).

3.4 Discussion

As in E1, overall, all children across both sharing conditions in E2 reliably performed the task that assessed their understanding of anonymous and identified sharing. This suggests that children's understanding of anonymous and identified sharing has begun to develop by age 3 years. These findings also indicate that children were not simply biased toward selecting an envelope with their name rather than an envelope without their name in this experimental task. However, 5-year-olds' understanding of identified sharing was better developed than their understanding of anonymous sharing.

Specifically, 100% of 5-year-olds understood how to share as an identified donor, and although 71% succeeded in a task that assessed 5-year-olds' understanding of anonymous sharing, their understanding of anonymous sharing was not yet perfect. In terms of 3-year-olds' understanding, it appeared that 3-year-olds' understanding of identified sharing was more fragile than 5-year-olds'.

As shown in E1, results from E2 also demonstrated that 3-year-olds and 5-year-olds shared similar amounts of stickers in both Anonymous and Identified Sharing conditions. These results indicated that children did not alter their sharing according to whether or not they were anonymous or identifiable. These findings did not support the hypothesis that 5-year-olds would share more generously as identified donors than as anonymous donors. However, these findings were in line with the hypothesis that 3-year-olds would share similarly across sharing conditions. There was no clear evidence for developmental differences in children's anonymous sharing between the 3- and 5-year-olds age groups.

Unlike adults (e.g., Haley & Fessler, 2005), findings from E1 and E2 suggested that children did not share less as anonymous donors than as identified donors. As discussed in Chapter 2, research has shown that a variety of factors influence children's generosity, even at a very young age (e.g., 3-year-olds shared more generously with in-group members than out-group members; Fehr et al., 2008). Thus, clearly children are capable of sharing differentially; however, anonymity may not yet influence young children's decisions about generosity the same way it influences adults.

Sharing similarly as an anonymous and as an identified donor might indicate that children simply do not fully understand the repercussions of anonymous sharing at this

age, or they do not have specific reputation or reciprocity motives. The findings to date do not allow us to distinguish between these alternatives. Rather than asking children to share anonymously, another way to tap into children's understanding of anonymous sharing is to ask them to make predictions about *other* people's identified or anonymous donations when they themselves are the recipients. If children recognize the implications of anonymous sharing, then children ought to demonstrate a preference to receive from identified donors and predict that identified donors share more generously than anonymous donors. If this is the case, it would suggest that children understand anonymous sharing and they may recognize that there are underlying motives for sharing. On the other hand, if children show no preference, this finding would be consistent with the current data, which show a lack of differential sharing, which might suggest that children do not yet consider motivations for sharing.

The next experiment explored children's predictions about others' generosity, and whether children have receiving preferences. To facilitate recruitment, and because findings from E1 and E2 indicated similar sharing results across 3- and 5-year-olds, the subsequent study focused on recruiting children in the upper age range through the school system. By testing 5-year-olds, it is possible to tap into the youngest age group wherein children successfully complete some tasks featuring anonymity. That is, by recruiting 5-year-olds, it was hypothesized that children would be more likely to understand anonymous and identified sharing as suggested by E1, thus yielding more reliable differential sharing data across sharing conditions. Furthermore, this recruitment decision was based on the fact that both age groups displayed similar patterns of sticker sharing in E1 and E2, suggesting that developmental sharing differences are not present within this

age range, making it unnecessary to test for age-related sharing differences across these

ages.

Chapter 4: Experiment 3

4.1 Rationale

The aim of Experiment 3 (E3) was to test directly whether children displayed preferences to receive from anonymous or identified donors. Assessment of children's preferences to receive from anonymous or identified donors potentially provides an alternative way of learning about children's understanding of anonymous sharing by differentiating between children's lack of understanding of the consequences of anonymity versus their lack of motivation for differentiating between anonymous and identified sharing. In other words, by developing a clearer picture of children's preferences about anonymous sharing, it potentially provides insight into their motives for anonymous sharing.

Whereas participants in E1 and E2 were in the role of the donor, participants in E3 participated in the role of the recipient. Participants in E3 were tested to assess whether they preferred to receive from donors who intentionally remained anonymous, or from donors who intentionally identified themselves. This approach provided another method of tapping into whether children are sensitive to anonymity in the context of sharing. Additionally, to better understand why children may have preferences, children were asked to predict how generously each donor might have shared. If children think about anonymous and identified donors similarly to the way adults do, children ought to prefer to receive from identified donors under the pretext that identified donors might share more generously than anonymous donors. Conversely, children should prefer not to receive from anonymous donors, under the assumption that they might share less generously than identified donors.

Previous sharing research has shown that younger children tend to keep more resources for themselves than they donate; however, when asked how many resources *ought* to be shared, children as young as 3-years-old adhere to equal sharing rules (e.g., Smith, Blake, & Harris, 2013). For instance, children as young as 3 to 4 years of age endorsed fairness norms when making decisions for a third party (e.g., Olson & Spelke, 2008) but when participating in sharing paradigms themselves, they donated less than half of the resources (e.g., Moore, 2009). Furthermore, Smith and colleagues (2013) found that 3 to 5-year-olds who commented on the importance of equal and fair sharing did not actually engage in equitable sharing during resource allocation tasks. Thus, research has shown that children under the age of 5 are aware of, and endorse fairness norms despite sharing in a way that benefits them until later in childhood (i.e., approximately age 8).

Aguilar-Pardo, Martínez-Arias, and Colmenares (2013) examined why sharing may be challenging for younger children. They tested 4- to 6-year-olds' candy allocations and theorized that prosocial behaviour necessitated that children inhibit their urges to maximize their own payoffs. Specifically, they hypothesized that children require executive functioning abilities, particularly inhibitory control, in order to behave prosocially – especially if the prosocial act comes at a cost, such as giving up their own candies. They predicted that children's sharing in a dictator game would correlate with their performance on the day-night inhibitory control task. Results supported their hypothesis given that children who performed better on an inhibitory control task were also more generous in the dictator game. This was interpreted as support that children's

ability to inhibit predicts generosity (i.e., children's ability to successfully inhibit their desire to maximize their outcomes correlates with increased sharing).

The findings in E1 and E2 examined children's understanding of anonymous sharing by assessing children's actions when they were in the role of the donor. By using a different paradigm wherein children were in the role of a recipient, it was possible to indirectly tap into children's understanding of anonymous sharing using a different angle from which to examine whether children understand anonymous sharing. Specifically, children participated in the role of the recipient, and made predictions about other donors' generosity. It was hypothesized that children would prefer to receive from identified rather than anonymous donors. Accordingly, it was also hypothesized that participants would predict that identified donors were nicer and more generous than anonymous donors, and that children's preference for identified donors would correlate with how generously children believed identified donors had shared. These hypotheses were based on the notion that, although 5-year-olds may not be motivated to share differentially themselves (as found in E1 and E2), 5-year-olds might understand that identified donors could have a vested interest in being strategically generous given that they are associated with their generosity.

4.2 Method

4.2.1 Participants. Five- and 6-year-olds were invited to participate in a study that was occurring in various public schools in Nova Scotia, Canada. Parents who wished to have their child participate in the study, signed and returned consent forms to classroom teachers. Children with signed forms were tested individually at their schools. Seventy-three participants were recruited from classrooms. Four participants were

excluded: one participant did not complete the task, one participant had not yet turned 5 years of age, and two participants were not typically developing. Of the 69 participants retained for analyses, children had a mean age of 5 years; 4 months (64 months; $n = 39$ girls).

4.2.2 Procedure. Participants were individually brought into a quiet room located near their classrooms. They were informed that they received 10 stickers for participating in the study. Participants' receiving preferences were assessed using the following protocol (See Appendix E for protocols):

I have two envelopes with stickers inside, from two different kids. You get to take one of these envelopes home with you! Each kid had 10 stickers to share. They could have shared some of their stickers, all of them, or none of their stickers. I don't know how many stickers either kid shared. So, I don't know how many stickers are in this envelope (indicate one envelope)*, or in this one* (indicate the other envelope)*. I do know that any stickers in this envelope are from Casey* (show one sealed envelope with 'From Casey' printed on it). *Casey put his/her[2] name on the back of this envelope* (show the back of the envelope) *because s/he wanted you to know that the stickers are from him/her! This envelope is from another kid* (show a plain, sealed envelope). *I don't know who the stickers in this envelope are from because this kid did not print a name on the envelope* (show the back of the envelope) *– this kid did not want you to know who the stickers are from. Both Casey* (indicate Casey's envelope) *and this kid* (indicate the other

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[2] In Experiments 1 to 4, minimal pronouns were used in the protocol scripts. However, when gendered pronouns were required, they were matched to the participant's gender. For example, boy participants heard, *"Casey put his name on the back of this envelope because he wanted you to know…"* whereas girl participants heard, *"Casey put her name on the back of this envelope because she wanted you to know…"*.

envelope) *could have put stickers in these envelopes to share. Which one do you want?*

Unbeknownst to participants, both envelopes contained 10 stickers. The two envelopes were held in front of participants. Each participant was then asked to select either the anonymous or identified (i.e., 'From Casey') envelope to keep. Envelope selection could have been made by verbal responses (e.g., "I want the one from Casey"), or by simply pointing to the envelope they wished to keep. Envelope selection was recorded as the participant's preference to receive either from an anonymous or identified donor.

After selecting the donor from whom they wished to receive, participants were asked follow-up questions to better understand participants' decision-making processes. The aims of these questions were to assess whether participants might be considering social or material payoffs when selecting the donor from whom they wished to receive. To attempt to tap into whether participants considered social and material payoffs when making decisions about which donor they prefer, participants were asked to predict which donor was more generous (i.e., "*Which envelope do you think has more stickers?*"). Children were also asked to predict exactly how many stickers were in both envelopes (i.e., "*How many stickers do you think are in this one?*"). Additionally, participants were asked to assess the donor's character (i.e., "*Which child do you think is nicer?*"). Participants' responses were recorded on protocol forms.

Participants were randomly assigned to counterbalanced conditions. Half of participants were first asked to select from which donor they wished to receive and then were asked follow-up questions (e.g., which envelope do you think has more stickers?).

The other half of participants were first asked questions about the quantity of stickers in the envelopes and which donor was nicer, and then were asked to select the donor from whom they wished to receive. Each time the experimenter referred to an envelope, she pointed to it to help direct participants' attention to the correct envelope.

4.3 Results

   4.3.1 Children's receiving preferences. Binomial tests were used to assess if participants preferred to receive from either donor at above chance rates. In accordance with the hypothesis, results revealed that 60 of the 69 participants (87%) preferred to receive from the identified donor, indicating a non-random preference to receive from identified donors rather than anonymous donors (binomial test, $p < .001$). There were no order effects.[3]

   4.3.2 Children's predictions about donors' sharing. Follow-up questions were asked in order to elucidate why children preferred to receive from the chosen donor. Binomial tests revealed that, as hypothesized, participants predicted that the identified donor was nicer than the anonymous donor at above-chance levels ($p < .001$). Specifically, 65 of the 69 participants (94%) predicted that the identified donor was nicer than the anonymous donor. Similarly, 55 of the 69 participants (80%) predicted that the identified donor shared more generously than the anonymous donor at above chance levels (binomial $p < .001$). A paired samples t-test revealed that, overall, participants predicted that the identified donor had shared significantly more stickers ($M = 7.86$, $SD = 2.55$) than the anonymous donor ($M = 5.39$; $SD = 3.63$; $t(68) = 5.23$, $p < .001$).

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[3] Binomial tests were used to examine children's receiving preference across Counterbalance Condition A and Counterbalance Condition B to see if there was an effect of order. In both counterbalanced conditions children preferred to receive from the identified donor ($p < .001$). These analyses replicated the omnibus analysis across counterbalanced conditions. There were no order effects. See Appendix E for differences across counterbalanced conditions in E3.

Prior to analyzing whether participants' receiving preferences interacted with their sticker predictions, a Levene's Test was conducted to verify that the assumptions of ANOVA were not violated given that participants had not been randomly assigned to conditions. Indeed, far fewer participants preferred to receive from the anonymous donor ($n = 9$) compared to how many preferred to receive from the identified donor ($n = 60$). Despite the unequal samples in both conditions, Levene's test revealed that the assumption of homogeneity of variance was met (Levene's Test for Identified Sticker Prediction, $F[1, 67] = 0.25$, $p = .616$; Levene's Test for Anonymous Sticker Prediction, $F[1, 67] = 0.06$, $p = .802$]). Therefore, the ANOVA findings were interpreted with confidence.

To examine whether participants' sticker predictions were influenced by their receiving preferences, a mixed model ANOVA was conducted. The within-participants variable was Sticker Prediction, with two levels (Anonymous Sticker Prediction and Identified Sticker Prediction). The between-participants variable was children's receiving preferences. Findings revealed a significant main effect of children's sticker predictions, $F(1, 67) = 4.57$, $p = .036$, $d = 0.787$, indicating that participants predicted that identified donors shared significantly more stickers ($M = 7.86$, $SD = 2.55$) than anonymous donors ($M = 5.39$, $SD = 3.63$). However, of particular interest was whether children's receiving preference influenced their sticker predictions. A significant interaction indicated that, as hypothesized, children's receiving preference correlated with the amount of stickers they predicted were shared by anonymous and identified donors, $F(1, 67) = 3.90$, $p = .052$; see Figure 4.1.

Paired samples *t*-tests were used to better understand the interaction between receiving preference and sticker predictions. Children who preferred to receive from identified donors predicted that there were significantly more stickers shared by identified donors ($M = 7.92$, $SD = 2.51$) than by anonymous donors ($M = 5.10$, $SD = 3.60$; [$t(59) = 5.68$, $p < .001$). On the other hand, the 9 children who preferred to receive from the anonymous donor did not predict significant differences between anonymous donors' sticker sharing ($M = 7.33$, $SD = 3.43$) and identified donors' sticker sharing ($M = 7.44$, $SD = 2.96$; [$t(8) = 0.09$, $p = .931$]. Together, these findings support the notion that children who preferred to receive from identified donors believed that individuals shared strategically more when they were identified. Moreover, although not statistically significant, if anything, children who preferred to receive from anonymous donors predicted that they would have received slightly more stickers from the donor that they did not choose, suggesting that they did not fully understand the role of anonymity in sharing behaviour.

4.4 Discussion

Findings from E3 supported the hypothesis that children preferred to receive from identified donors rather than anonymous donors. Also, as hypothesized, most children assessed identified donors as being nicer and more generous compared to anonymous donors. Likewise, children who preferred to receive from identified donors predicted that identified donors shared significantly more stickers than anonymous donors. Together, these findings support the idea that children may consider others' self-serving motives for sharing given that children perceived anonymous and identified donors as distinctive. These findings did not reveal which motives, if any, children

considered when sharing. Nonetheless, it is interesting that participants' responses are in line with theories of reputation and reciprocity, which purport that identified donors should be more generous than anonymous donors because their reputation is at stake or their generosity could influence their opportunities for reciprocity. In this study, children's preference for identified donors seemed to be linked to their belief that identified donors were nicer and shared more generously than anonymous donors. It is possible that children believed that donors who wished to be identified had positive reputations (i.e., nice, generous), and donors who wish to be anonymous had nefarious intentions to share ungenerously.

As predicted, children's receiving preferences correlated with their predictions about how many stickers were shared by anonymous and identified donors. Specifically, children who preferred to receive from identified donors (compared to anonymous donors) predicted that identified donors shared more generously than the anonymous donors. It seems like the majority of children opted to select the envelope that they believed would have the greatest payoff for them. Perhaps children associated being identified with being generous because children considered underlying reasons about donors' sharing. Conversely, the few children who selected the anonymous envelope did not predict significant differences in the amount of stickers in either envelope. It seems these children did not understand, or did not consider, underlying motives for sharing.

It is interesting to note that in experimental scenarios in E1 and E2, 5-year-olds did not share differentially when they were assigned to be anonymous and identified donors. Yet children of the same age in E3 distinguished between anonymous and identified donors and demonstrated a clear preference for identified donors. Generally,

children predicted that identified donors shared 24% more than anonymous donors; this translates into children predicting that anonymous donors shared approximately two to three stickers less than their identified peers. These findings could suggest that children understand anonymous sharing, and, indeed, they may understand that identified donors could have a vested interest in sharing generously.

In terms of children's predictions about others' generosity, children expected others to be very generous, or (at a minimum) conform to fairness norms given that children predicted that donors shared half, or more, of their resources. This finding was aligned with Smith and colleagues' (2013) experimental findings. In their study, which examined the difference between children's actual sharing and their thoughts on sharing, Smith et al. found that younger children (e.g., 3-year-olds) endorsed fairness norms but did not engage in fair sharing until later in childhood, around age 7 or 8. Like Smith and colleagues, the current findings indicated that around age 5 children predicted that others would share at least half of their resources, yet 5-year-olds sharing (as observed in E1 and E2) did not conform to fairness norms. That is, just as Smith et al. noted, sharing data suggests that 5-year-olds might not share in accordance with their predictions. Considering E1, E2, and E3 together, children expected donors to share differentially across anonymous and identified donors even though they did not share differentially when they were donors themselves.

There are numerous ways in which experiments can be used to study children's understanding of anonymous sharing. In E1 and E2 children were randomly assigned to share as anonymous or identified donors; in E3 children chose whether they preferred to receive from anonymous or identified donors; another way of testing children's

understanding is by examining whether children prefer to share as anonymous or identified donors. Given that E3 revealed that children preferred to receive from identified donors, would children also prefer to share as anonymous or identified donors? Moreover, if children demonstrated a preference to share in a particular way and if they had the opportunity to choose whether they shared as anonymous or identified donors, would they subsequently demonstrate differences in how generously they shared? The final experiment sought to answer these research questions. Additionally, to test the robustness of the findings from E3, the following experiment attempted to replicate E3 findings after children participated in a sharing paradigm as donors.

Chapter 5: Experiment 4

5.1 Rationale

Adults share more generously in circumstances when they know their sharing amount is known to others, and associated with them (e.g., Haley & Fessler, 2005). Interestingly, E1 and E2 results with children did not follow this pattern. Findings from E1 and E2 indicate that young children do not share less when they are anonymous and more when they are identified. In E1 and E2, participants were randomly assigned to share as anonymous or identified donors and they shared similarly in both conditions. However, findings from E3 demonstrated that children strongly preferred to receive from identified donors (rather than anonymous ones). Could children also prefer to share as either an anonymous or identified donor? Following from this, if children were given the chance to *choose* whether they wanted to make their generosity known or not by opting to share as identified or anonymous donors would strategic sharing patterns emerge? A literature review suggests that, to date, there has been no research conducted to test whether adults have sharing preferences. Thus, the goals for Experiment 4 (E4) were to better understand children's understanding of anonymity by assessing whether children preferred to share as anonymous or identified donors, and subsequently test if children shared differently across conditions after they opted to share as anonymous or identified donors.

The first goal of E4 was to assess whether children preferred to share as anonymous or identified donors (i.e., children's sharing preferences). This was of interest as E1 and E2 results indicated that children shared the same when assigned to anonymous and identified donor conditions, yet, E3 findings showed that children preferred to receive from identified donors and that they thought that identified donors were more

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likely to be generous and nicer than anonymous donors. E3 findings demonstrated that children associated identified donors with being generous. Moreover, children's preference to receive from identified donors was taken as evidence that children think strategically about sharing insofar as children predict that identified donors are vested in generous sharing whereas anonymous donor are not. While E1 and E2 might suggest that children do not discern across anonymous and identified sharing, findings from E3 suggests that children can, and do, discern across these types of sharing – even if this distinction is not reflected in their own sharing behaviour. By examining whether children preferred to share as anonymous or identified donors, E4 attempted to develop a better understanding of children's anonymous sharing in concert with the findings from E1, E2 and E3. Based on E3 findings, it was hypothesized that children would prefer to share anonymously in order to strategically keep more resources for themselves without their stinginess being associated with them.

The second goal of E4 was to assess if children shared differently as anonymous or identified donors after they had had the opportunity to select their donor status. By giving children the opportunity to select their donor status, rather than being assigned a status, it was thought that this manipulation might prompt children to consider differences between sharing as anonymous or identified donors, which in turn, was predicted to result in differential sharing across conditions. It was hypothesized that, like adults, children would share less as anonymous donors than as identified donors. This was based on the assumption that more children would want to share anonymously so that they could be selfish and share fewer stickers without negative repercussions. This hypothesis complemented the E3 results, which revealed that children predicted that

anonymous donors were stingy. It was thought that a small percentage of children might prefer to share as known donors for reasons unrelated to strategically keeping more resources for themselves (e.g., motives of improving their reputation by sharing in an identified fashion). For children who might prefer to share as identified donors, it was predicted that they might share stickers on the basis that (any amount of) sharing might be viewed as a positive prosocial act. Although E1 and E2 results showed that children did not share differently across conditions, E3 was different because children were first allowed to select whether they wished to share as anonymous or identified donors. Indeed, it was thought that giving children the opportunity to select their donor status might prompt children to think about why they preferred to share in a particular way, and this reflection could result in differential sharing.

The third goal of E4 was to replicate E3 findings, and to see if the results held up even after children had been given the opportunity to first participate in a sharing paradigm. The procedure of E3 was conducted again, this time using a larger sample size. Children participated in the E3 replication immediately after they completed the E4 sharing paradigm to see if children continued to predict significant differences in another donor's generosity after participants had just chosen how to share as anonymous or identified donors themselves. Based on E3 results, it was hypothesized that children in the E3 replication study would prefer to receive from identified donors rather than anonymous donors, and children would indicate that identified donors were nicer and more generous than anonymous donors. Likewise, it was hypothesized that children would predict that anonymous donors shared significantly fewer stickers than identified

donor. Replicating the E3 findings would indicate that findings about children's receiving preferences are quite robust.

5.2 Method

5.2.1 Participants. Five- and 6-year-olds were invited to participate in a study that was conducted in several public schools in Nova Scotia, Canada. It was important to recruit children of a similar age in both E3 and E4 in order compare across the two research questions (i.e., do children demonstrate receiving preferences; do children demonstrate sharing preferences) and also because another goal was to replicate E3 findings, which tested children of this age. Thus children aged 5 and 6 were recruited for E4.

Parents who wished to have their child participate, signed and returned consent forms to classroom teachers. Children with signed forms were tested individually at their school. A total of 84 participants were recruited from classrooms. Two participants were excluded because they were not typically developing. Eighty-two participants with a mean age of 5 years; 7 months (69 months; girls $n = 41$) were retained for analyses.

5.2.2 Procedure. Each participant was brought into a quiet room located near their classrooms. Participants were informed that they received 10 stickers for agreeing to participate in the study. To assess sharing preferences, participants were informed that they had an opportunity to share their stickers with a child named Alex[4]. Participants' sharing preferences were assessed using the following protocol (See Appendix F for protocols):

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[4] The name Alex was chosen because it is a gender-neutral name.

If you want, you can share your stickers with another kid named Alex. All you'd have to do is put the stickers you want to share with Alex, inside Alex's envelope, like this (demonstrate)*. You could share some of your stickers with Alex, all of them, or none of them. I'll take this to Alex* (indicate envelope)*, but I won't look inside, so I won't know if you shared or not. Remember, these stickers are yours now, so it's up to you if you want to share them with Alex. There are two ways you can share your stickers. One way to share is to put your name on the envelope, like this* (demonstrate)*, so that when Alex sees this envelope, s/he will know this is from you. The other way to share is to NOT put your name on the envelope, like this* (demonstrate)*, so that when Alex sees this envelope, s/he will NOT know this is from you, and I won't tell him/her.* (display both envelopes) *Which envelope do you want to give to Alex?*

Participants were in counterbalanced conditions. Half of participants were first taught how to share as an identified donor and then taught how to share as an anonymous donor (as shown in the script above). The other half of participants were first taught how to share as an anonymous donor and then taught how to share as an identified donor. Any time the experimenter referred to an envelope, she pointed to it to guide participants' attention to the appropriate envelope.

Both envelopes were held in front of participants; one envelope showed the participant's name and the other did not. Participants were asked to select either the anonymous or identified envelope to use to give to Alex. Envelope selection could be made by verbal responses, or by pointing to the envelope they wished to use. Upon selecting the envelope they wished to use, the experimenter held up the selected envelope

and questioned, "Will Alex know this envelope is from you when he sees this?[5]". All participants answered this correctly, suggesting that they understood how to share as anonymous and identified donors. Envelope selection was used to denote participants' preferred donor status (i.e., whether they preferred to share as anonymous or identified donors).

Then, in a dictator game, out of view of the experimenter, participants had an opportunity to share some, all, or none of their stickers with Alex, using the envelope they had selected. Participants kept stickers for themselves by putting stickers in their own envelopes. After participants' allocated stickers, they participated in the E3 replication study to assess their receiving preferences. Participants' receiving preferences were assessed using the same script and method procedure from E3 (See section 4.2.2). Participants' responses were recorded on protocol forms.

5.3 Results

5.3.1 Children's sharing and receiving preferences. A binomial test was used to test the hypothesis that participants would prefer to share as anonymous donors rather than identified donors. Counter to the hypothesis, findings revealed that 56 of 82 participants (68%) chose to share using the identified envelope ($p = .001$), meaning that participants preferred to share as identified donors rather than as anonymous donors, at above-chance rates. All children correctly answered manipulation check questions wherein children were asked whether or not Alex would know that the envelope s/he received was from the participant, based on the envelope the participant opted to use.

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[5] As described in Section 4.2.2, all protocol scripts were matched to the gender of the participant. That is, the fictitious child, Alex, was referred to using feminine pronouns if the participant was a girl, whereas 'Alex' was referred to using masculine pronouns if the participant was a boy.

Given the results from E3, it was hypothesized that participants would prefer to receive from identified donors. As hypothesized, binomial results revealed that 64 of the 82 participants (78%) preferred to receive from the identified donor ($p < .001$), indicating that participants preferred to receive from identified donors at above chance rates. This replicated E3 findings. There was no effect of order on children's sharing or receiving preferences.[6]

Given that the hypothesis was supported in the E3 replication (i.e., children would prefer to receive from identified donors), but the E4 hypothesis that children would prefer to share as anonymous donors was not supported, an exploratory non-parametric McNemar Test was conducted to assess whether sharing and receiving preferences were correlated (see Table 5.1). The McNemar Test revealed no relation between these variables indicating that, proportionally, participants' sharing preferences did not correlate with their receiving preferences ($p = .185$). Interestingly, the majority of participants (65.8%) preferred to share as and receive from the same donor status. That is, follow-up binomial test showed that of the 56 participants who preferred to share as identified donors, the majority (82%; 46 participants) also preferred to receive from identified donors at above chance levels ($p < .001$). Interestingly, 26 participants preferred to share as anonymous donors, of whom 18 preferred to receive from identified donors, as hypothesized; however, this was not at above chance rates ($p = .076$). It seems that, regardless of how children preferred to share, they generally still preferred to receive

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[6] Binomial tests were used to examine children's sharing and receiving preference across Counterbalance Condition A and Counterbalance Condition B to see if there were order effects. In both counterbalanced conditions, children preferred to share as, and receive, from the identified donor (across all binomial tests, $p < .05$). These analyses replicated the findings insofar as children preferred to share as, and receive from, identified donors regardless of the counterbalanced condition to which they were assigned. There were no order effects.

from identified donors (e.g., 82% of children who shared as identified donor, preferred to receive from identified donors; 69% of children who shared as anonymous donors preferred to receive from identified donors).

5.3.2 Sticker sharing as a donor. Although E1 and E2 results revealed no difference between the number of stickers shared among anonymous and identified donors, it was hypothesized that sharing differences would emerge in E4. This hypothesis was primarily due to the fact that participants in E4 were allowed to select their preferred donor status before allocating resources, which was predicted to prompt children to consider differences associated with sharing as anonymous or identified donors. In line with this hypothesis, given that E3 showed that participants thought that other donors shared significantly different amounts of stickers based on their donor status, it was hypothesized that participants would prefer to share anonymously on the basis that children in E3 thought that anonymous donors shared fewer stickers (compared to identified donors) and presumably children in E4 would be motivated to keep stickers for themselves without their greediness being associated with them.

Data analyses included unequal sample sizes because participants were not randomly assigned to anonymous ($n = 26$) or identified ($n = 56$) sharing conditions. Therefore, a Levene's Test was completed prior to conducting an ANOVA to assess for sharing differences. The Levene's test revealed that the assumption of homogeneity of variance was met (Levene's Test $F[1, 80] = 1.55$, $p = .216$). Therefore, the ANOVA findings were interpreted with confidence.

A between-participants univariate ANOVA ($\alpha = .05$) tested for differences in the number of stickers shared by participants who preferred to share as anonymous and

identified donors. Overall, participants shared a mean number of 3.27 ($SD = 2.67$) out of 10 stickers. Counter to the hypothesis, results revealed no effect of sharing preference on sticker sharing (F[1, 80] = 1.71, $p = .195$, $d = 0.298$; see Figure 5.1). That is, even when participants selected their donor status, they shared similarly as anonymous donors ($M = 2.77$, $SD = 2.69$) and identified donors ($M = 3.50$, $SD = 2.19$). Although this was counter to the hypothesis, these findings were in line with the sharing results in E1 and E2.

5.3.3 Children's predictions about donors' sharing. As part of the replication study that assessed children's receiving preferences, participants were asked follow-up questions to tap into whether children considered social and material payoffs when deciding if they wanted to receive from an anonymous or identified donor. Binomial tests revealed that, as hypothesized, participants thought that the identified donor was nicer than the anonymous donor at above-chance levels ($n = 64$; 78%; $p < .001$) and more generous than the anonymous donor at above-chance levels ($n = 60$; 73%; $p < .001$). A paired samples t-test revealed that, overall, participants predicted that the identified donor had shared significantly more stickers ($M = 7.49$, $SD = 2.91$) than the anonymous donor ($M = 5.23$; $SD = 3.33$; t(81) = 5.04, $p < .001$). These results replicated E3 findings.

To examine whether sticker predictions were influenced by whether children preferred to receive from anonymous or identified donors (i.e., children's receiving preference), a mixed model ANOVA was conducted, using receiving preferences as the between-participants variable, and using the number of stickers predicted in the anonymous and identified envelopes as the within-participants variable. Levene's tests showed that the assumption of homogeneity of variance was met for the analysis of the

anonymous envelope sticker predictions and the analysis of the identified envelope sticker predictions (F[1, 80] = 0.22, p =.643; F[1, 80] = 3.76, p =.056).

ANOVA findings revealed a significant main effect of sticker predictions (F[1, 80] = 10.44, p = .002, d = 0.723). That is, overall, participants predicted that significantly more stickers were shared by identified donors (M = 7.49, SD = 2.91) than by anonymous donors (M = 5.23, SD = 3.33). Of primary interest was whether children's receiving preference influenced their sticker predictions. Children's receiving preference was not significantly correlated with the amount of stickers they predicted were shared by anonymous and identified donors (F[1, 80] = 3.15, p = .080). Unlike E3, the interaction did not reach significance in E4. Although the interaction trended toward significance, the findings did not support the hypothesis that children's receiving preference influenced their sticker predictions. Based on the main effect, it seemed that more stickers were predicted to be shared by identified donors (from both children who wanted to receive from identified donors [7.81(SD = 2.70)] and from children who wanted to receive from anonymous donors [6.33 (SD = 3.40)], whereas fewer stickers were predicted to be shared by anonymous donors both by children who wanted to receive from anonymous donors [5.56 (SD = 3.05)] and by children who wanted to receive from identified donors [5.14 *(SD* = 3.42).

5.4 Discussion

5.4.1 Sharing and receiving preferences. E4 afforded an alternative approach to examine whether children are sensitive to anonymous and identified sharing by testing if children preferred to share as anonymous or identified donors. The results from this experiment demonstrated that children preferred to share as, and receive from, identified

donors - the latter result replicated E3 findings. Indeed, children assessed identified donors as more generous and nicer than anonymous donors. Although children displayed strong sharing and receiving preferences, these preferences did not correlate with each other. Interestingly, among children who preferred to share as identified donors, they were also more likely to prefer to receive from identified donors (than from anonymous donors). It was hypothesized that the majority of children would prefer to receive from identified donors and share as anonymous donors; although a few children displayed this pattern of preferences, results did not reach significance and therefore, the findings did not support this hypothesis. E4 served to both replicate the previous findings from E3 and demonstrated that children preferred to share as identified donors.

Children's sharing and receiving preferences might be interpreted as support for the idea that children think strategically about sharing behaviour. Certainly children are strategic about their sharing in other contexts. For example, the fact that 4-year-olds were more likely to share with friends than non-friends and strangers (Moore, 2009) suggests that, early in development, children are sensitive to the donor-recipient relationship and how generously they want to share. In the current work, children's clear preferences to share as, and receive from, identified donors suggested that children did not see anonymous and identified donors as equivalent. Perhaps children's preference to receive from identified donors stemmed from the belief that identified donors were generous because they could ultimately benefit from their generosity. Perhaps children's preference to share as identified donors stemmed from the desire to be associated with sharing. However, this experiment did not assess children's motives and it is possible that

children's general preference for identified receiving and sharing was not motivated by factors related to generosity.

Nonetheless, children's clear sharing and receiving preferences (shown in E3 and E4) in conjunction with their task performance in E1 and E2 suggests that 5-year-olds have a reasonably good understanding of anonymous sharing and the ramifications of anonymous sharing, even if they do not apply this knowledge. The gap between knowledge and action has been described by Wynn (1997) and Sophian (1997) as the competence-performance distinction. The competence-performance gap is often referred to in terms of children's numerical learning, however, there are parallels with the current work given that children in the current work endorse certain ways of thinking about anonymous sharing that do not align with their actions when they participate in anonymous sharing paradigms. Akin to the competence-performance distinction, there is a disconnect between 5-year-olds' conceptual knowledge about anonymous sharing (e.g., that anonymous donors are less generous than identified donors) and 5-year-olds' performance in anonymous sharing paradigms (i.e., children share the same as anonymous and identified donors). Perhaps children's performance in the dictator game is not necessarily representative of their conceptual understanding of anonymous sharing; this possible explanation is in line with Wynn and Sophian who suggest that there is a gap between children's knowledge and their actions. Moreover, if there is a gap between children's knowledge and their performance, it is possible that children truly are motivated to share strategically. In line with the idea that children may wish to behave strategically, Hala and Russell (2001) found that 3-year-olds cannot adopt strategies on the first trial in the dictator game; however, they can learn strategies over the course of

subsequent trials. Thus, perhaps 5-year-olds, like 3-year-olds, also benefit from multiple

trials in order to have enough experience to act according to their strategic sharing

thoughts.

5.4.2 Anonymous & identified sharing (self & other). Interestingly, despite

children's sharing and receiving preferences, children shared equal amounts even when

they self-selected to share as an anonymous or identified donor. In some ways, E4

findings were not surprising given that they replicated findings from a similar dictator

game in E1 and E2, wherein children were randomly assigned to share as anonymous or

identified donors. Akin to E1 and E2 findings, children in E4 also shared similar amounts

of stickers in both anonymous and identified conditions. E4 sharing findings were

counter to the hypothesis that children would prefer to share ungenerously as anonymous

donors when given the opportunity to choose their donor status.

Even though children in this study shared similarly as both anonymous and

identified donors, they predicted that *other* identified donors were nicer and more

generous than anonymous donors. Research from Smith et al. (2013) may help explain

the findings from E4. As described before, Smith and colleagues have shown that there

are differences in children's *actual* sharing compared to how much they claim that they

ought to share. Smith and colleagues assessed how children aged 3- to 8-years-old shared

four stickers. Participants were asked questions pertaining to how many stickers they

thought they *should* share and would *actually* share, as well as how many stickers another

child *should* and would *actually* share with them. Essentially, this work examined the

disconnect between children's actual sharing behaviour and their beliefs about sharing.

Similar to the current findings, Smith et al.'s results revealed that younger children (i.e.,

participants between the ages of 3 and 6 shared less than half of their stickers; findings from E1, E2 and E4 support this. Smith et al. also found that all children thought that they *should* share half of their stickers and that, likewise, others *should* share half of their stickers with them. Similarly, participants from the current study also predicted that other children shared half, or (perhaps wishfully hoped) more than half of their stickers with them, even though they did not share this generously when given an opportunity to do so. Therefore, while Smith et al. showed that children believed that equal sharing should be applied to themselves and others, only older children (aged 7 and 8 years) shared according to fairness norms; they refer to this as the judgment-behaviour gap. Smith and colleagues' judgment-behaviour gap helps to make sense of the E4 results insofar as it seems that findings from E4 supported the notion that 5-year-olds may aspire to share in a fair manner and they may hold others to these expectations; however, 5-year-olds did not (or could not) share according to their own beliefs.

Similar to a judgment-behaviour gap, Aguilar-Pardo et al. (2013) described a disconnect between children's desire to share and their ability to inhibit their own selfishness. Aguilar-Pardo and colleagues found that inhibitory control correlated with 5-year-olds' generosity. They propose that prosocial behaviour necessitates that children inhibit their urges to maximize their own payoffs, which requires children to have certain executive functioning abilities, in particular, inhibitory control. Aguilar-Pardo et al. predicted that 4 to 6-year-olds' candy allocations in a dictator game would correlate with their performance on the day-night inhibitory control task. Their results supported their hypothesis and children who performed better on an inhibitory control task shared more generously in the dictator game. This was interpreted as support that children's ability to

inhibit their desires to maximize their own profit predicts children's ability to share generously.

Interestingly, contrary to the hypothesis (and the findings from E3), children's receiving preferences did not interact with how many stickers they predicted were shared by anonymous and identified donors. The lack of an interaction between sticker prediction and receiving preference appeared to be accounted for by the fact that all children, regardless of their receiving preference, predicted that anonymous donors shared less generously than identified donors. This suggests that children believe that there are differences between anonymous and identified donors' generosity and, despite this belief, children do not always opt to maximize their payoff (i.e., they did not always select the envelope that they thought contained the most stickers). Perhaps the children who selected the identified envelope, which encompassed the majority of children, wanted to maximize the amount of stickers they could receive. Indeed, maximizing the amount of stickers they received, very well could have been children's rationale for preferring to receive from identified donors given that this was aligned with their predictions about how generously they thought identified donors shared. It seemed that the minority of children who preferred to receive from anonymous donors (even though they predicted that anonymous donors shared less) were interested in selecting the anonymous envelope for reasons other than receiving a high number of sticker. It is possible that children who preferred to receive from anonymous donors did not understand anonymous sharing and what anonymity might have implied in terms of generosity. While it seemed that some children considered underlying motives for sharing (based on the fact that children believed that there were differences between anonymous

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and identified donors' generosity), other children might not have fully understood the

task or might have experienced competing demands during their decision-making

process.

Chapter 6: Discussion

6.1 Dissertation Goals Reviewed

The aim of this dissertation was to examine sharing in anonymous and identified contexts. Anonymous sharing is interesting to study as it helps provide insight into whether motives, such as reputation and reciprocity, underlie children's prosocial behaviour. The focus of this chapter is on reviewing the experimental findings and interpreting them in relation to the research questions, and linking the findings to the related literature. Limitations of these dissertation studies and directions for future research are discussed. Concluding remarks are provided.

Adults engage in strategic sharing wherein they share less as anonymous donors and more as identified donors; however, little is known about when children become motivated to share strategically. In this dissertation, children's sharing was assessed in anonymous and identified conditions in order to examine whether children shared differently across these contexts. Sharing in anonymous contexts does not benefit donors given that it does not enhance their reputation or opportunities for reciprocity; whereas if donors share in identified contexts when they can be associated with their generosity, their sharing may improve their reputation and chance of reciprocity. Therefore, if children are motivated to ultimately benefit from sharing, one would expect children to behave more generously in identified situations than in anonymous situations. By examining children's prosocial behaviour in anonymous versus non-anonymous scenarios, it is possible to speculate upon whether children are strategically prosocial (e.g., for reasons of reputation and reciprocity).

The goals of this dissertation were to test whether children shared differently in anonymous and identified contexts. The following research questions were relevant to this program of research: First, do young children understand anonymous sharing? Second, does anonymity influence children's generosity? Third, as an alternate way to tap into children's understanding of the ramifications of identified and anonymous sharing, do children prefer to share as, and receive from anonymous or identified donors? In testing these research questions, it is possible to draw inferences from the results regarding which factors might contribute to prosocial behaviour.

Four empirical studies were used to address the research questions in this dissertation. In E1, children's understanding of anonymous sharing was assessed by asking children to provide verbal responses indicating whether or not their donations were anonymous. Subsequently, children were given an opportunity to share stickers as anonymous or identified donors in a dictator game. Using a modified protocol, E2 assessed children's understanding of anonymous sharing by asking children to select an envelope that would render their donations anonymous or identified. Again, children participated in a sticker sharing dictator game. In E3, children's predictions about other donors' generosity as a function of their anonymity status were assessed and children were given an opportunity to identify whether they preferred to receive from anonymous or identified donors. Finally, children's preferences to share as anonymous or identified donors were examined in E4. Also in E4, a replication of E3 was completed. Results are outlined below in relation to the research questions.

6.2 Do Young Children Understand Anonymous Sharing?

One of the key goals of this dissertation was to test whether 3- and 5-year-olds

understand anonymous sharing. Although previous studies have examined young children's behaviour using paradigms that featured anonymity, none sought to assess whether children understood anonymity (e.g., Grunberg et al., 1985). Both E1 and E2 aimed to test children's understanding of anonymous sharing independent of their actual sharing behaviour. E1 asked children to provide verbal responses indicating whether or not donors' sticker sharing would be anonymous or not. E2 used a modified assessment wherein children were required to select the proper envelope to make themselves anonymous or identified donors. Results from both studies suggest that generally children performed at above chance rates across sharing conditions and across age groups.

E1 revealed that 5-year-olds outperformed 3-year-olds; however there were no differences in understanding anonymous and identified sharing based on whether children were assigned to Anonymous or Identified Sharing conditions. It is possible that any differences in children's understanding of anonymous versus identified sharing were washed out in E1 due to a protocol that scaffolded 3-year-olds' ability to understand the significance of having one's name on an envelope. In particular, E1 protocols were aimed to give 3-year-olds ample opportunity to understand the anonymous sharing condition. There was evidence of a difference in understanding based upon age and condition in E2. Analyses that simultaneously compared across both conditions and age groups indicated that, although 3-year-olds performed similarly on tasks that assessed their understanding of anonymous and identified sharing, 5-year-olds performed significantly better on a task that assessed their understanding of identified sharing compared to their understanding of anonymous sharing in E2. This significant difference between anonymous and identified task performance appeared to be driven by the fact that 5-year-olds' understanding of

anonymous sharing is not yet perfect. Indeed, the revised protocols in E2 seem to highlight that 5-year-olds truly understand identified sharing, whereas their understanding of anonymous sharing is still developing. Considering findings from E1 and E2, it seems that even 3-year-olds have emerging understanding; however, it is more fragile than 5-year-olds. These findings are more closely aligned with the hypothesis that 5-year-olds, but not 3-year-olds would correctly answer questions assessing their understanding of anonymous sharing, even though 5-year-olds' understanding of anonymous sharing is imperfect.

While these results indicate that children as young as age 3 *may* be capable of understanding tasks that feature anonymity, their understanding ought to be assessed within the experimental paradigm to verify that participants understand the specific task in which they are participating. This suggests that results from past research that tested 3-year-olds using experiments featuring anonymity ought to be interpreted cautiously. For example, Benenson et al. (2007) studied 4- to 9-year-olds' anonymous sticker sharing. They reported increased anonymous sharing with age. Although Benenson and colleagues reportedly "went to great lengths to ensure that the child understood that the child's decision was completely anonymous" (p.171; i.e., experimenters covered their eyes to afford privacy to the donors during their allocation decisions), children were not formally tested to confirm that they understood that their allocations were anonymous. This is problematic considering that children as young as 4 years old participated in this study without having their understanding of anonymity assessed. Likely 4-year-old participants in that study had (at least) some understanding of the task; however, it is debatable whether they fully understood anonymous sharing, especially in light of the

fact that even 5-year-olds' in the current works did not perform with 100% accuracy in the anonymous sharing condition in E2.

One explanation for children's relative difficulty in correctly responding in the Anonymous Sharing condition is that this task might have required more complex cognitive skills than the Identified Sharing condition – cognitive skills that may be more strongly developed among 5-year-olds than among 3-year-olds. It seems that it was relatively straightforward for 5-year-olds to understand identified sharing. For example, visual information (i.e., their name printed on an envelope) provided information to the recipient. In the experimental paradigms in this dissertation, a name on an envelope indicated who the donor was, and thus, the donors' generosity was associated with the donor. However, understanding the anonymous sharing condition might have been less intuitive as it required children to recognize that a lack of information (in this case, a lack of a name printed on an envelope) also conveyed information (in this case, that the recipient did not know who donated, and the donors' actions could not be associated with them). Recognizing that a lack of information provided information might have been difficult for 3- and 5-year-olds to understand in the current studies.

There is likely a shift between 3- and 5-year-olds' ability to understand anonymous sharing. Indeed, the ability to understand anonymous actions may not develop until closer to age 4 years when children understand that their perspectives are separate from others' perspectives (Moore, 2006). Moreover, between ages 3 and 5 years children develop ToM-related cognitive skills, including understanding what others know and do not know. For example, 3-year-olds have been shown to fail knowledge-ignorance tasks that test their understanding of other people's knowledge (Wellman & Liu, 2004).

These ToM–like, cognitive skills likely contribute to children's ability to understand anonymous sharing. Taking these developmental changes into consideration, it is possible that 3-year-olds struggled to respond correctly in the Anonymous Sharing condition due to their developmental stage, and their immature cognitive abilities. Moreover, although these cognitive abilities are more developed among 5-year-olds, tasks that require these mentalizing-types of skills are still challenging.

In short, E1 and E2 represent the first experiments that aimed to test children's understanding of anonymous sharing independent of their actual anonymous sharing. Although further research that aims to replicate the current findings would be prudent, the current findings suggest that children's understanding of anonymous sharing is developing at age 3 years, and is better developed by age 5 years, but it is still imperfect.

6.3 Does Anonymity Influence Children's Generosity?

Children have been shown to share differentially based on age and sharing context (e.g., Paulus, 2014). Although little research exists directly comparing children's sharing in anonymous and non-anonymous contexts, previous research has shown that 3- and 5-year-olds' are sensitive to various sharing contexts. For example, Paulus (2014) found that 5-year-olds, but not 3-year-olds, shared stickers more generously with poor than wealthy recipients, even when sharing came at a cost to themselves and even when they allocated third party stickers with no associated cost. Paulus' findings provide evidence of differential sharing at the same ages that were tested in the current studies. Other studies have demonstrated that 5-year-olds' sharing is influenced by being observed (e.g., Leimgruber et al., 2012).

It was hypothesized that children would share differently as anonymous and identified donors. Specifically, it was predicted that, like adults, 5-year-olds who understand anonymity would share less generously as anonymous donors than as identified donors, whereas 3-year-olds were predicted to not understand anonymous sharing would not share differently as anonymous or identified donors. These hypotheses were based on Leimgruber and colleagues' (2012) work which showed that 5-year-olds shared more generously when their sharing was observed by a classmate recipient and when their donations were placed in transparent container, compared to when children were not observed and when their donations were in opaque containers. Leimgruber and colleagues inferred that children want to be associated with generosity; moreover, these findings could be taken to suggest that young children's sharing is influenced by whether their sharing can be associated with them. These results lent support to the hypothesis that children studied in this dissertation would share differently in non-anonymous and anonymous scenarios when they would and would not be associated with their generosity. Previous work provides support for the hypothesis that 3- and 5-year-olds would share differently across anonymous and identified conditions. This hypothesis was not supported.

No overall sharing differences were observed between 3-year-olds and 5-year-olds across E1, E2, and E4, which used dictator game paradigms to assess sharing in anonymous and identified contexts. Although previous research has reported sharing differences within this age range (e.g., Paulus, 2014), the lack of significant differences between 3- and 5-year-olds in the current work is not entirely surprising considering some experiments have suggested that developmental sharing differences around this age

are negligible (Gummerum, et al., 2008). Additionally, some research has suggested that sharing differences are only observed when tested across a larger age range such as 7-year-olds to 18-year-olds as assessed by Harbaugh et al. (2003). For example, Benenson and colleagues (2002) found significant sharing differences between 4- and 9-year-olds, but not between 4- and 6-year-olds, which is similar to the age groups tested in the presented studies. Thus, although there was precedent to hypothesize that sharing differences might be observable across 3- and 5-year olds, it would be remiss to ignore the fact that results from E1, E2 and E4 are in line with other studies that did not observe developmental sharing trends within a narrower age range at this point in development.

It is clear that by adulthood, though, adults share less generously when they are anonymous than when they are not anonymous. For example, Piazza and Bering (2008) found that adults donated more generously if they were informed that other people were aware of their donations than when others were unaware of their donations. Likewise, Haley and Fessler (2005) found that undergraduates allocated significantly more money when they were in a condition where stylized eyespots were present compared to conditions in which skewed eyespots or no eyespots were present. Haley and Fessler concluded that even subtle cues of being observed by human eyes increased adults' generosity. Thus, while adults' generosity seems sensitive to being observed and is influenced by a lack of privacy, the current findings suggest that anonymity (in the dictator game context) does not appear to influence 3- and 5-year-old children's sharing.

Having tested a rather large sample of children in three separate experiments with slightly varying methodologies, the current studies found no evidence that anonymity influenced children's sharing. Even when given the chance to choose whether they

wanted to be anonymous or identified donors in E4, children still shared similarly as anonymous and identified donors. Although children's degree of generosity in E1, E2 and E4 did not differ based on whether or not they were anonymous, children's general level of generosity was comparable to the general level of generosity reported in the literature in experiments that used dictator games to allocate 10 resources (e.g., Forsythe et al., 1994). It is possible that anonymity does not impact sharing differently across these two age groups, or perhaps understanding of anonymity simply does not influence sharing behaviour itself until later in childhood. It might be particularly challenging for 3-year-olds to engage in strategic sharing, given that 3-year-olds have been shown to struggle with tasks that ask them to engage in other forms of strategic behaviour.

Perhaps young children require multiple attempts to learn how to act strategically (Hala & Russell, 2001). Hala and Russell (2001) used a modified windows task to assess whether 3-year-olds would be able to use strategic deception in order to retain a treat. Although 3-year-olds were able to adopt a deceptive strategy after several trials, it is noteworthy that 3-year-olds often did not know how to engage in strategic deception on the first trial. This suggests that 3-year-olds may need extra time to learn how to behave strategically. Although Hala and Russell examined strategic deception, not strategic sharing, it is possible that the children who participated in one-shot dictator games in this dissertation may not have had enough time to develop or learn a way of sharing strategically. If this is the case, children may not have caught on to how they could have shared strategically. Indeed, although differential sharing was not observed among children in the current studies, it is still possible that children in E1, E2, and E4 considered sharing strategically.

Perhaps children struggle to demonstrate strategic sharing due to their developmentally immature abilities to act according to their thoughts. That is, perhaps children were, indeed, motivated to share strategically more when they were identified donors, but they could not inhibit their desire to keep stickers for themselves (Aguilar-Pardo, et al., 2013). If children struggle to inhibit their urge to keep stickers, this could wash out differential sharing effects between anonymous and identified sharing. This possible explanation for the lack of differential sharing in the current works is in line with Aguilar-Pardo and colleagues' findings, which demonstrated that children's increased sharing was associated with better performance on an inhibitory control task. Indeed, if inhibitory control issues were present among children in E1, E2 and E4, children may have been motivated to share differently across conditions but may not have been able to inhibit their urges to keep stickers. That is, children may not have been able to act in a way that aligned with their thoughts. This discrepancy between thoughts and actions is akin to the judgment-behaviour gap Smith et al., (2013) described between children's actual sharing and their thoughts about how they should share.

The disconnect between cognitions and actions has also been described by Zelazo, Frye, and Rapus (1996), who found that children do not always act appropriately during experimental tasks, even when they show that they understand the rules. This discrepancy is sometimes referred to as *abulic dissociations*. Zelazo and colleagues found that 3-year-olds perseverated on incorrect rules during a card sort task despite demonstrating that they know the rules. Zelazo et al. explained children's failure to act in accordance with their knowledge as the result of their still developing executive function abilities, which are necessary for individuals to behave in a way that corresponds with their thoughts.

Likewise, Sophian (1997) might describe the difference between children's performance and their knowledge as the competence-performance distinction, wherein children's performance (e.g., in the dictator game) is not necessarily representative of their conceptual understanding (e.g., of anonymous sharing). Furthermore, Sophian (1997) would suggest that in order to truly understand children's knowledge, we should consider both children's performance (e.g., sticker sharing) as well as the underlying processes that contribute to children's performance. Without considering conceptual processes, it is unclear if children's performance is an accurate reflection of their competence. There is the added challenge, as Sophian notes, that underlying processes cannot be observed (e.g., in a dictator game); rather, they can only be inferred.

Challenges aligning one's thoughts with one's actions is not simply a problem found in childhood; the desire to keep more resources for oneself has been demonstrated in adulthood as well. For example, even adults (who presumably have fully formed executive function abilities) tend to keep more resources for themselves in paradigms where they allotted resources between themselves and others, compared to paradigms where they shared on behalf of another donor (Forsythe, et al., 1994). There are numerous possible accounts for why differential sharing did not occur in the current work. For example, it could be argued that if children wanted to share strategically, they could have simply shared less (or nothing at all) in Anonymous Sharing conditions and continued to share the standard amount (e.g., 3 stickers) in the Identified Sharing condition, thereby demonstrating strategic sharing without giving away 'extra' stickers. Nonetheless, this was not the case. Could it be that children understand the basic idea of anonymous sharing, but they do not understand the *implications* of sharing anonymously?

To more closely examine children's understanding of the ramifications of anonymous sharing, children's opinions regarding anonymous sharing were examined by assessing whether children preferred to share as, and receive from, anonymous or identified donors.

6.4 Do Children Prefer to Share as, and Receive from, Anonymous or Identified Donors?

E1 and E2 examined whether young children understood anonymity; however, it remained unclear whether children understood the consequences of anonymous and identified donations. That is, when children share anonymously, they can control how much they share without negative repercussions. Thus, if children understand the ramifications of anonymous sharing, and if children are motivated to keep desired resources (which, presumably, might be the case), then children should prefer to share anonymously. Thus, one way to create a more complete picture regarding children's understanding of anonymous sharing is to examine whether children prefer to share as anonymous or identified donors. Testing children's sharing preferences offers a possible way to indirectly examine children's understanding about sharing in a way that supplements knowledge derived from directly testing children's sharing behaviour. Another way to try to understand how children view anonymous and identified sharing is to assess if they prefer to receive from anonymous or identified donors. Testing receiving preferences provides an opportunity to ask children about their predictions about how generous other donors will act when either anonymous or identified. E3 and E4 set out to complement and extend past work by testing children's sharing and receiving preferences. Indeed, if children demonstrate clear preferences, it suggests that children truly understand anonymous sharing (and its consequences).

To test children's receiving preferences, children in E3 and E4 were given the chance to receive an envelope that contained an unknown amount of stickers from either an anonymous or identified donor. Overwhelmingly, children preferred to receive the envelope from the identified donor rather than the anonymous donor. To help elucidate the reasons children may have receiving preferences, children responded to follow-up questions. Children's responses to these questions revealed that children assessed identified donors as nicer, and more generous than anonymous donors. Together these findings supported the hypotheses that children prefer to receive from identified donors and predict that (compared to anonymous donors), identified donors are nicer and share more. This could be taken as evidence that children are motivated to maximize their payoff, and they understand that identified donors have a vested interest in sharing generously.

There were also some children (albeit, a minority), who preferred to receive from anonymous donors. Perhaps these children did not understand anonymity; indeed, E1 and E2 demonstrated that children's understanding of anonymity is still developing; therefore, some children may have believed that there would be no difference in anonymous and identified donors' generosity and selected either envelope randomly. Or perhaps children simply did not understand the differences between the two sharing contexts and their implications for generosity. Supporting the notion that some children may not have understood, results show that children who preferred to receive from the anonymous donor did not predict differences in how many stickers they thought were shared by anonymous and identified donors, suggesting that these children did not understand the consequences of sharing as either an anonymous or identified donor.

Because so few children preferred to receive from anonymous donors, cautious interpretation is warranted when discussing results pertaining to the few children who preferred to receive from anonymous donors.

To test children's sharing preferences, children in E4 were given an opportunity to share stickers. In the E4 paradigm, before allocating stickers, children first chose whether they wanted to share their stickers as anonymous or identified donors; this was used to assess children's preferred sharing status. It was hypothesized that children would prefer to share as anonymous donors. This hypothesis was based on the idea that children would rather share anonymously in order to share ungenerously without negative ramifications. Counter to the hypothesis that children would rather share anonymously, children strongly preferred to share as identified donors. A post-hoc explanation of children's preference to share as an identified donor could be explained by children's interest in being associated with sharing generously. That is, children may have been motivated to share resources in an identifiable fashion in order to reap potential benefits, rather than being motivated to share anonymously (as hypothesized) in an ungenerous fashion.

Children's responses in E3 and E4 suggest that most children believe that anonymous and identified donors are different in terms of their generosity simply by virtue of being anonymous or not. By extrapolating from E3 and E4 findings, the mere fact that children think that anonymous and identified donors are different from each other – at least in terms of how generously they share – could suggest that children think sharing is motivated by something. In support of the fact that children may specifically consider motives of reciprocity, Dreman and Greenbaum's (1973) interviews revealed

that a small percentage of 5-year-old boys from middle class socioeconomic backgrounds reported sharing generously for reasons of reciprocity. Thus, there is rationale to support the theory that 5-year-olds in the current work might also have considered underlying motives for sharing.

Children's preferences were tested for correlations between their receiving preference and their predictions about other donors' generosity. Analyses revealed a pattern in E3 wherein children who preferred to receive from identified donors (which encompassed most children) predicted that identified donors were more generous than anonymous donors. Among the few children who preferred to receive from anonymous donors, they did not predict that their selected donor (i.e., the anonymous donor) was significantly more generous than the identified donor who they rejected. However, in E4, it seems that generally children estimated that anonymous donors were stingy and identified donors were generous –regardless of their receiving preferences, which led to a strong main effect, rather than an interaction. Based on the findings from E3 and E4, this work finds that children believe that there are differences between anonymous and identified donors' degree of generosity. In spite of the consistent belief that there were differences across donors, children often – but not always – selected the envelope that they thought contained the most stickers. Overall, children tended to prefer identified donors, and tended to predict that identified donors were more generous. Perceived differences across donors may indicate that children considered underlying motives of sharing; however, further research is needed to elucidate whether or not this is the case.

6.5 Children's Predicted Generosity Versus their Actual Generosity

Interestingly, children shared similarly in anonymous and identified sharing conditions even though they preferred to share as identified donors. Perhaps this preference stems from a general interest in being associated with sharing and appearing generous. Or perhaps children simply enjoy having their name on their 'work' (or on envelopes, as in the case of these experiments). Or perhaps children's lack of differential sharing in spite of a strong sharing preference stems from children's difficulty inhibiting their urges to maximize their own sticker payoff in both conditions. According to Aguilar-Pardo et al., children require certain executive functioning abilities, including inhibitory control, in order to share according to their strategic beliefs. It is possible that the children in the current studies were still developing inhibitory control, and until these abilities are more fully developed, children will struggle to share strategically, especially if strategic sharing means giving up a desired resource to appear more generous. Supporting Aguilar-Pardo and colleagues, Paulus' (2014) work suggests that children's *understanding* about sharing may be "masked" in experimental paradigms in which children share their own resources. According to Paulus, it is possible that 3- and 5-year-olds' ability to share strategically is impeded by issues of self-control. According to this reasoning, children in the current studies may have experienced difficulty inhibiting selfish actions (i.e., keeping resources for themselves), resulting in their inability to share more generously as identified donors. Young children who are still developing aspects of inhibitory control may think about sharing, however, a lack of inhibition may hinder their behaviour.

Children in the current work shared approximately three stickers as both anonymous and identified donors; yet, they predicted that anonymous donors would share

at least half of their resources, and that identified donors would share significantly more generously (sharing approximately seven stickers). One account for the discrepancy between children's predictions about others' behaviour and their own behaviour is that children's thoughts and actions may not align at this age. Smith and colleagues (2013) found a discrepancy between young children's actions and thoughts. In their study, they found that 3-year-olds reported that they should share fairly (and others should too), but they did not share fairly. Indeed, when given the opportunity to share, 3-year-olds kept more stickers for themselves. Interestingly, when asked how they would actually share, 3-year-olds predicted they would keep more stickers for themselves. Conversely, 7- and 8-year-olds both reported that everyone (including themselves) should share fairly; they also predicted that they would share fairly, and subsequently they did share fairly. Thus, 3-year-olds understand fairness norms, however fair sharing is not enacted until age 7 or 8 years. While Smith et al.'s study is not a perfect explanation for children's behaviour in the current work, Smith et al. tested a similar age group as in the current studies and their experiment had enough parallels to the current work to possibly account for why children predicted very generous offers by other donors even though they shared less than half of the resources when given the chance to do so.

Unlike Aguilar-Pardo and colleagues' (2013) theory, Smith and colleagues (2013) found that all children passed inhibitory control tasks; suggesting that the mismatch between children's actions and their thoughts might not be accounted for by issues of inhibition. Alternatively, if the disconnect between sharing and thoughts about sharing are not due to inhibitory control issues, children's predictions about others' generosity may simply reflect children's wishful thinking (i.e., the number of resources children

hoped were donated). Or, children's predictions about others' actions may reflect their appreciation for fairness norms. According to Smith and colleagues' findings, 3-year-olds understood fairness norms but did not engage in fair sharing until age 7 or 8. This explanation might account for why children in the current studies predicted that even the stingiest of donors shared at least half of their stickers even though they themselves shared less than half. The fact that children predicted differences among other donors' generosity, but they did not share differently as anonymous and identified donors when they were in the role of the donor, might suggest that children think differently about anonymous sharing, but do not act differently when given the chance to do so. While children's predictions that anonymous and identified donors share differently may hint at children's beliefs that sharing is strategic, this remains untested.

6.6 Do Children Have Underlying Motives for Sharing?

This dissertation tested children's anonymous sharing. It did not assess children's sharing motives, nor did it empirically test whether children think strategically about sharing. Nonetheless, one of the reasons it is interesting to study children's anonymous sharing is because it allows speculation on the motives that may influence children's sharing.

Individuals with positive reputations enjoy successful social interactions and are rewarded with successful social standing (Baumeister, 1982). Therefore, it is not surprising that sharing studies have found that adults are motivated to improve their reputation. For example, adults are more generous when they are identified, and when their degree of sharing is known (e.g., Hoffman et al., 1994). Likewise, according to Trivers' (1971) theory of reciprocity, prosociality is motivated by the goal of personally

benefitting from one's prosocial behaviour. Falk and Fischbacher's (2005) theory of reciprocity suggests that corresponding types of behaviour are reciprocated based on how an action is perceived (e.g., sharing generously ought to result in generous return benefits). In a study that assessed adults' sharing behaviour, participants who shared with the same donor who had previously shared with them (i.e., reciprocal sharing) shared approximately the same amount that the donor shared with them (Ben-Ner et al., 2004). Conversely, adults who shared with a new donor shared less generously than the donor who had shared with them. These findings suggest that adults are more generous when they are sharing reciprocally compared to when they are sharing with a non-reciprocating recipient. Theories of reputation and reciprocity have been used to account for adults' prosocial behaviour.

Like adults, children have shown interest in developing their own positive reputations (Hill & Pillow, 2006). Of course, in order to consider their reputation, children must recognize that others form their opinions of them based on their behaviour. Children must also concern themselves with acting in a way that is beneficial to their reputations. Although reputation management can be complex, children appear to value their reputations from an early age. For example, Banerjee (2002) demonstrated that by age 8, children strategically select the type of information they share in order to increase their reputation within a targeted domain (e.g., improving their reputation regarding their intellect versus their athleticism). It appears that children take pains to develop a positive reputation, and to be perceived positively. Little is know about whether children strategically share as a way of improving their reputation, or benefitting in some way.

In the current work, the connections drawn between children's sharing and their motivations are speculative. The results from this dissertation could be taken to support the theory that children's sharing is motivated by factors, such as reputation and reciprocity. For example, in terms of sharing preferences, children may have preferred to share as an identified donor because this offered them a chance to share publicly, which could improve their chance of future reciprocity, or enhance their reputation. That is, children may have considered sharing in an identifiable fashion as an opportunity to display their aptness toward prosociality. Additionally, children's preference to receive from identified donors could be taken as support that children think that identified donors ought to have a vested interest in sharing generously because their identified sharing might enhance their reputation and improve their likelihood of future reciprocity. However, children did not share significantly different amounts as anonymous and identified donors in the current studies, even though they predicted differences in generosity from other identified and anonymous donors (at least those who preferred receiving from identified donors). Currently, there is no support for children's own strategic anonymous sharing by age 5, even though children seem aware of others motives to share strategically. It is possible that children failed to act in accordance with their thoughts (e.g., Aguilar-Pardo et al.). It is also possible that children are not motivated by the same reasons as adults to engage in strategic sharing. Given that the current work did not directly assess sharing motives, firm conclusions about children's sharing motives cannot be drawn.

6.7 Limitations and Future Studies

This section reviews limitations of this dissertation and provides considerations for future studies.

6.7.1 Sample. The sample recruited for these studies was somewhat homogeneous. In particular, children who participated in E1 and E2 were recruited from a metropolitan area near the university where participants likely came from middle-upper class socioeconomic backgrounds. Recruitment efforts extended to rural areas for E3 and E4, which encompassed children from a broader range of socioeconomic backgrounds. The majority of children who participated in all four studies were Caucasian. Moreover, typically developing children were recruited for these studies and therefore the findings may not be generalizable to atypical populations (e.g., children with Autism Spectrum Disorder; ASD). Future studies could aim to recruit children of diverse backgrounds to ensure that the findings are generalizable to a broader population.

Future studies could test anonymous sharing among a broader age range – in particular, older children. The current findings suggest that children as young as 3 are developing an understanding of anonymous sharing; however, it seems that children do not consistently apply their own understanding of anonymous sharing by age 5. This disconnect between knowledge and action may be circumvented by testing older children in similar paradigms. Indeed, many of the speculations pertaining to children's sharing centre on the idea that children might think strategically about anonymous and identified sharing, but simply did not (or could not) act in accordance with their thoughts (c.f., Zelazo, et al., 1996 found that 3-year-olds perseverated on incorrect rules despite knowing correct rules). Indeed, in line with Zelazo et al.'s theory that children fail to act in accordance with their knowledge due to their still-developing executive function

abilities, extending future studies to include an older age range would be a useful way to test children's behaviour when they are at a developmental stage that allows them to act in accordance with their knowledge. Moreover, studying older children (e.g., 8-year-olds) would also provide an opportunity to assess anonymous sharing during a time in development when children also become concerned with sharing equitably (e.g., Smith et al., 2013). Testing older children would extend the current work by providing a larger developmental range to capture developmental shifts in strategic sharing (e.g., Fehr et al., 2008). Moreover, if children's sharing is motivated by reciprocity this motivation may not be present until later in childhood. Some developmental research suggests that reciprocity norms are understood by age 5 or 6 years (e.g., Youniss, 1980), whereas others have argued the prosocial behaviours are not completed with the goal of reciprocity until adolescence (e.g., Eisenberg 1986). Given the dearth of research in the area of children's anonymous sharing, recruiting a large age range is likely the most useful strategy for assessing when children begin to share strategically less when they are anonymous and strategically more when they are identified.

6.7.2 Design. The protocols in this dissertation that tested children's understanding of anonymity required children to select an envelope that either said it was from them, or a blank envelope that did not include their name. Future protocols may include a distractor envelope (e.g., children could be asked to select the correct envelope from three possible envelopes: an envelope without any name, an envelope with their name, and an envelope with a random name). A distractor envelope would improve upon the design of the study because children would no longer have a 50-50 chance of guessing the correct envelope. Indeed, if children select the correct envelope in a task that

includes a distractor envelope it would provide additional confidence in the findings that children understand anonymous sharing. Slight modifications to the current script would accommodate having a distractor envelope[7]. For example, in future experiments, participants could then be given the opportunity to select from a blank envelope, or one that says, 'From [*participant*]', or one that says 'From [*insert random name*]'. The E2 script could be modified to incorporate three envelopes [8].

It might also be useful to consider a protocol wherein children have more than one opportunity to indicate whether they understand anonymous sharing. In the current experiments, each study included only one trial to assess children's understanding of anonymous sharing. Rather than using a one-shot approach to assessing anonymity, it may be worthwhile to consider alternative designs. Using a multi-trial approach may not require a vastly different protocol from the protocols used in this dissertation. It may be possible to present children with numerous 'envelope trials'. For example, the experimenter could have a stack of envelopes with and without donor names printed on them. The experimenter could enlist the child to help with the task of figuring out whether or not the recipient would know whom the envelopes are from. The experimenter could present two or three envelopes to the child (per trial) and ask whether the recipient would know who the donor is. Then children could be given an opportunity to share using similar envelopes, and be assigned to share as anonymous or identified donor. Modifications such as these could allow for ongoing testing of children's understanding

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[7] In E2, the script said, "*We want Casey to know the stickers are from you. So, which envelope do we use so that Casey knows the stickers are from you?*"

[8] "*We do not want Casey to know who the stickers are from. So, which envelope is the best envelope to use, to make sure that Casey does* not *know who the stickers are from? What envelope is the best one to make sure it's a secret for Casey*".

of anonymous sharing, while simultaneously increasing the confidence in the current

findings.

6.7.3 Methodology. According to a *post hoc* power calculation, E1[9] and E2[10]

were only able to detect significant differences in children's sharing if the effect of

anonymity was above 0.76 or 0.80 (respectively), which are large effect sizes. Given that

neither of these studies yielded significant sharing findings, it suggests that the sample

was not large enough to detect differences in children's anonymous and identified

sharing. Interestingly, an *a priori* power analysis indicated that E4 was not underpowered

and yet, E4 also revealed no significant sharing differences across conditions. In an

exploratory analysis, data from E1, E2, and E4[11] were combined ($N = 190$) to generate a

sense of whether significant findings were detected across Anonymous and Identified

Sharing conditions. By combining data from these experiments, the analysis was

sufficiently powered. Results from aggregated data from E1, E2 and E4 indicated that

there were still no differences in children's sharing across anonymous and identified

sharing conditions[12]. Nonetheless, combining data from experiments that used different

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[9] A *post hoc* sensitivity analysis was calculated for E1. Alpha was set at 0.05, power was set at 0.8, the total sample for E1 was $n = 57$, the degrees of freedom was set at 1, and the number of groups was set at 4. This calculation generated an effect size f of 0.378, which converts to a Cohen's d of 0.76. This indicates that with a sample of 57 children, E1 could detect significant findings if the effect size was 0.76 or larger.
[10] A *post hoc* sensitivity analysis was calculated for E2. Alpha was set at 0.05, power was set at 0.8, the total sample for E2 was $n = 51$, the degrees of freedom was set at 1, and the number of groups was set at 4. This calculation generated an effect size f of 0.400, which converts to a Cohen's d of 0.80. This indicates that with a sample of 51 children, E2 could detect significant findings if the effect size was at least 0.80.
[11] A *post hoc* sensitivity analysis was calculated for combining data across E1, E2, and E4. Alpha was set at 0.05, power was set at 0.8, the total sample was $n = 190$, the degrees of freedom was set at 1, and the number of groups was set at 4. This calculation generated an effect size f of 0.204, which converts to a Cohen's d of 0.41. This indicates that with a sample of 190 children who understand anonymous sharing, significant findings could be detected between anonymous and identified sharing if the effect size was medium sized (i.e., 0.41) or larger.
[12] Univariate ANOVA was conducted using data from E1, E2, and E4. Results revealed no main effect of Age, $F(1, 189) = 0.70$, $p = .403$, no main effect of Sharing condition, $F(1, 189) = 0.004$, $p = .950$, and no interaction between Age and Sharing such that it influenced children's sticker sharing, $F(1, 189) = 0.00$, $p = .983$.

protocols is an imperfect approach; in the future, an adequate sample size should be recruited for the chosen analyses.

Another potential limitation is that children's sharing may not have differed across Anonymous and Identified Sharing conditions because the dictator game used in E1, E2, and E4 was not adequately sensitive to detect sharing differences. Dictator games are commonly used in sharing studies with young children, and have detected sharing differences among young children who were tested in different experimental manipulations (e.g., Benenson et al., 2007). Nonetheless, future studies may consider different paradigms. Specifically, future studies could attempt to mitigate abstractness from protocols by using videos to show the child with whom the participant will be sharing, or possibly pairing participants up such that one participant is the donor and the other is the recipient (e.g., students from Classroom A have a chance to share stickers with students from Classroom B). Such designs come with their own methodological issues (e.g., maintaining standardized pairings across children). Perhaps the next step in this line of research is replication. Replication studies could ask children interview questions aimed to assess their understanding of and motivations about strategic sharing. Interviews could be coded and analyzed using thematic analyses to test for recurring patterns of meaning across the data (e.g., Braun & Clarke, 2006).

Future studies may consider testing anonymous sharing in a third party context. The current studies used a dictator game wherein children shared their own resources as anonymous or identified donors. When sharing their own resources, it is possible that issues of self-interest and difficulty with self-control contaminated the findings. Using a third party sharing paradigms ought to help mitigate these concerns because children

ought to be less motivated by self-interest to retain resources given that they do not keep anything themselves; c.f. Prencipe & Zelazo (2005) found that young children's performance in third-party tasks was improved compared to when they acted out of self-interest. Prencipe and Zelazo tested 3- and 4-year-olds' performance in delay of gratification tasks and found that children's sharing was influenced by their ability to adopt others' perspectives. In their study, Prencipe and Zelazo found that 3-year-olds were better at 'delay' options when selecting pennies, stickers, and candies on behalf of a third party, versus when they made choices for themselves. It seemed that 3-year-olds understood that delay conditions were better, but they were too impulsive when they acted on their own behalf, compared to when they acted on behalf of a third party. By selecting resources on behalf of a third party, children were able to consider their actions more thoughtfully rather than having impulsive urges to keep resources immediately for themselves. On the other hand, sharing as a third party member may result in children simply resorting to sharing equally rather than thinking about sharing strategically for their own benefits given that they do not have any vested interests in how resources are allocated. By using different types of paradigms and experimental manipulations, it may help generalize findings to other situations involving anonymity. Or conversely, different protocols may reveal that generosity changes across different types of anonymous contexts. At this time, it is difficult to predict whether the current findings are generalizable to other anonymous scenarios.

6.8 Implications & Contributions

The current work has made a significant contribution to our understanding of anonymous sharing. The studies in this dissertation are among the first to examine

whether young children understand anonymous sharing. The current findings suggest that children as young as 3 years succeed on experimental tasks in which children are asked to make themselves anonymous or identified donors. However, this understanding is still fragile – especially in terms of 3 year olds' understanding, and in terms of anonymous (rather than identified) sharing. Therefore, past work that has tested children as young as 3-years-old in dictator game paradigms that featured anonymity ought to be interpreted cautiously, especially if the studies did not formally verify whether children understood the paradigm (e.g., Grunberg et al., 1985).

Given that this is the first program of research dedicated to assessing children's understanding of anonymous sharing, it would be prudent to replicate these findings. Improvement upon the paradigm may generate more robust findings (e.g., by creating a paradigm where children have less than a 50% chance of guessing the correct response; see Section 6.7.2 for suggestions); this would add to the current research contributions. Additional lines of inquiry will generate more confidence regarding when children understand anonymous sharing such that they can participate meaningfully in research protocols that include anonymity.

Considering the broader practical implications, it is generally wise to nurture prosocial skills given that these prosocial abilities promote positive relationships and foster a healthy sense of connection between people. Indeed, prosocial behaviour such as sharing has been show to predict success in specific domains, such as academic grades (e.g., Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000). Often interventions aimed at improving prosocial skills are targeted toward populations where prosocial skill development can be problematic, such as among children with cognitive issues (e.g.,

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learning disorder), developmental delays (e.g., ASD), or behavioural concerns (e.g., oppositional defiance disorder). Typically such intervention programs incorporate teaching social skills (e.g., asking for and offering help, and learning to share with peers). These prosocial (often termed *social*) skills are taught through modeling, coaching specific skills, and providing reinforcement when appropriate skills are demonstrated (e.g., Reddy, 2012). Although the explicit teaching of (pro)social skills is often targeted toward particular subpopulations, teaching the same strategies to all children is judicious.

6.9 Concluding Remarks

Given that prosocial behaviour is important for maintaining successful, ongoing social interactions, it critical to understand and encourage the development of prosociality among children. In order to foster prosociality it is helpful to understand what motivates prosociality. The studies described in this dissertation shine light on the area of children's anonymous sharing. This dissertation represents the first work to manipulate anonymity as a lens through which to test whether children share differently in contexts when they may or may not benefit from their prosocial actions. There were multiple aims of this dissertation. Specifically, one goal of this dissertation was to test children's ability to understand anonymous and identified sharing. Another goal was to assess whether children shared differently as anonymous and identified donors. Finally, another goal of this dissertation was to examine whether children displayed preferences to share as, and receive from, anonymous or identified donors.

The experiments in this dissertation were among the first to test children's understanding of anonymous sharing independent of their sharing behaviour. The results from E1 and E2 indicated that very young children are beginning to understand

anonymous sharing. Children's understanding of anonymity is not fully developed at age 5 years; however, by age 3 this ability has emerged and by age 5 years it is better developed. E3 and E4 subsequently revealed that children believed that anonymous donors were generally stingier than identified donors. Children generally predicted that identified donors were more generous than anonymous donors; this prediction generally, but not always, correlated with children's preference to receive from more generous (identified) donor. Children also displayed preferences to share as identified donors, rather than anonymous donors. In spite of these preferences, however, when children were in the position to share as anonymous and identified donors, they shared similarly in both scenarios. Children's similar sharing across conditions was found consistently in E1 and E2 (when children were randomly assigned to a sharing condition), and in E4 (when children had the opportunity to choose if they wanted to share as anonymous or identified donors). It seems that children begin to understand anonymous sharing at age 3, but they are still not applying their understanding to their actions by age 5.

Although children did not share differently as anonymous and identified donors, children believed that other donors shared differently in anonymous and identified contexts. Developmental psychologists generally concur that various factors, such as cognitive abilities (e.g., ToM, executive functioning skills) and emotional development are associated with prosocial behaviour (e.g., Keller, 2004). Theories of reciprocity and reputation management provide an explanation for factors that could motivate children's prosociality. The findings that children predict that others share differently as anonymous and identified donors could be taken as evidence that children believe sharing is motivated by underlying factors; however, this remains untested. More studies are needed

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to contribute to the knowledge outlined in this dissertation about children's anonymous sharing. The current program of research acts as a stepping stone for future sharing studies that aim to assess differences across anonymous and identified sharing. Additional investigations beyond the studies in this dissertation are needed to replicate the current findings and extend the current work. Future studies could consider testing a broader age range, and using modified paradigms.

In conclusion, better understanding children's anonymous sharing provides insight into children's motives for prosocial behaviour, which makes it possible to promote prosociality. Studies, such as the studies presented in this dissertation, suggest that children have some understanding of anonymous sharing including the recognition that others share differently as anonymous and identified donors. It remains unclear at what age children display the same strategic anonymous sharing that they predict in others. The current findings provide evidence that young children are sensitive to anonymity; however, further lines of investigation are needed to better understand whether motives of reputation and reciprocity influence children in anonymous sharing contexts. The current work represents an incremental advancement in the area of children's anonymous sharing, and supplements previous sharing research.

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Table 2.1

Children's Verbal Responses Broken Down by Age (E1)

	Age	
	3-year-olds	5-year-olds
Correct	26	31
Incorrect	10	0
Total	36	31

Table
3.1

Children's Understanding of Anonymous Sharing Across Age and Sharing Conditions (E2)

		Correct Response	Incorrect Response
Anonymous Sharing Condition	3-year-olds	13	7
	5-year-olds	10	4
Identified Sharing Condition	3-year-olds	14	6
	5-year-olds	14	0

Table
3.2

Children's Understanding of Anonymous & Identified Sharing Across Age and Sharing Conditions (E1 & E2)

		Correct Response	Incorrect Response
	E1 3-year-olds	13	7
	E1 5-year-olds	17	0
Anonymous Sharing Condition			
	E2 3-year-olds	13	7
	E2 5-year-olds	10	4
	E1 3-year-olds	13	3
	E1 5-year-olds	14	0
Identified Sharing Condition			
	E2 3-year-olds	14	6
	E2 5-year-olds	14	0

Table 5.1

Contingency Table of Children's Receiving & Sharing Preferences (E4)

		Receiving Preferences		
		Anonymous	Identified	Total
Sharing Preferences	Anonymous	8	18	26
	Identified	10	46	56
	Total	18	64	82

Figure 2.1. Prop used in E1. Pictured below: Investigator-created mailbox that participants used to 'mail' an envelope to Casey as part of the experimental procedure.

Figure 2.2. Sticker Sharing Across Age and Sharing Condition in E1. A 2 X 2 ANOVA (α = .05) with the Number of Stickers Shared as the dependent variable revealed no main effect of Age ($p = .924$), no main effect of Sharing Condition ($p = .772$), and no interaction between Age and Sharing Condition ($p = .358$). Mean number of stickers shared was 4.30 ($SD = 2.56$) out of 10. Standard error bars are presented.
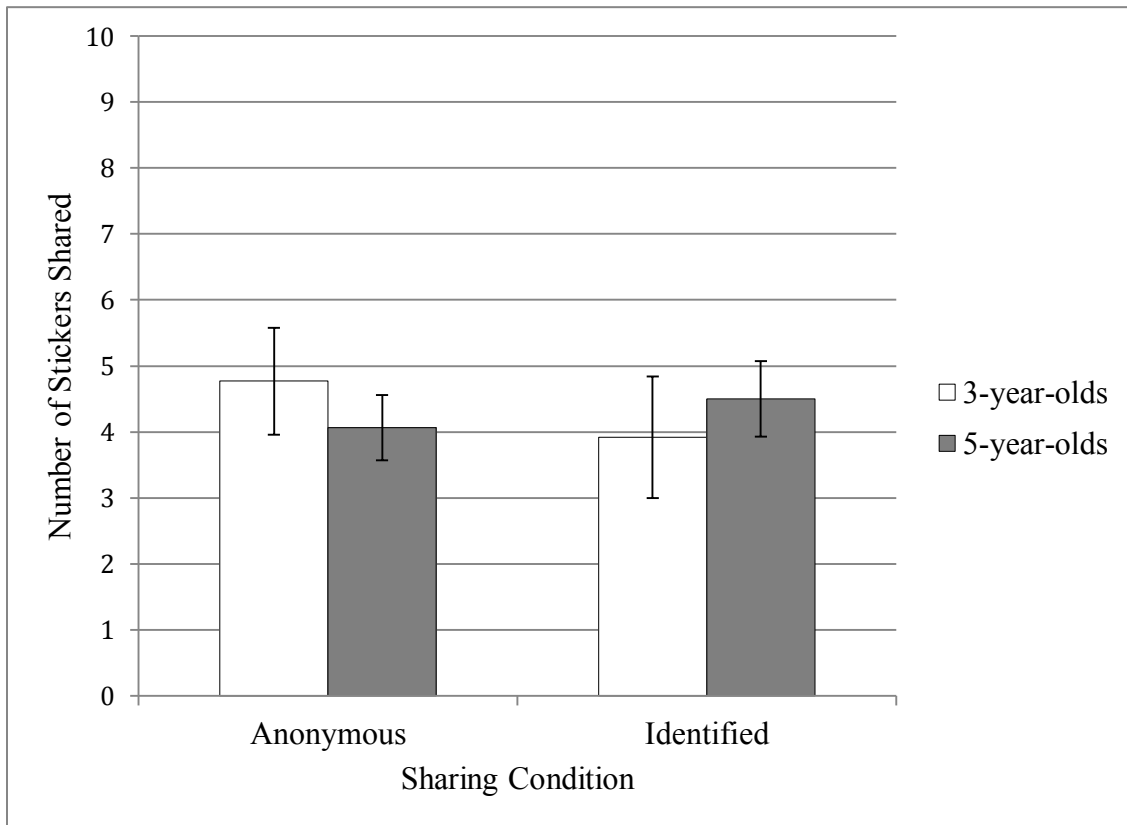
Figure 3.1. Sticker Sharing Across Age and Sharing Condition in E2. A 2 X 2 ANOVA ($\alpha = .05$) with the Number of Stickers Shared as the dependent variable revealed no main effect of Age ($p = .817$), no main effect of Sharing Condition ($p = .635$), and no interaction between Age and Sharing Condition ($p = .825$). Mean number of stickers shared was 3.51 ($SD = 2.70$) out of 10. Standard error bars are presented.
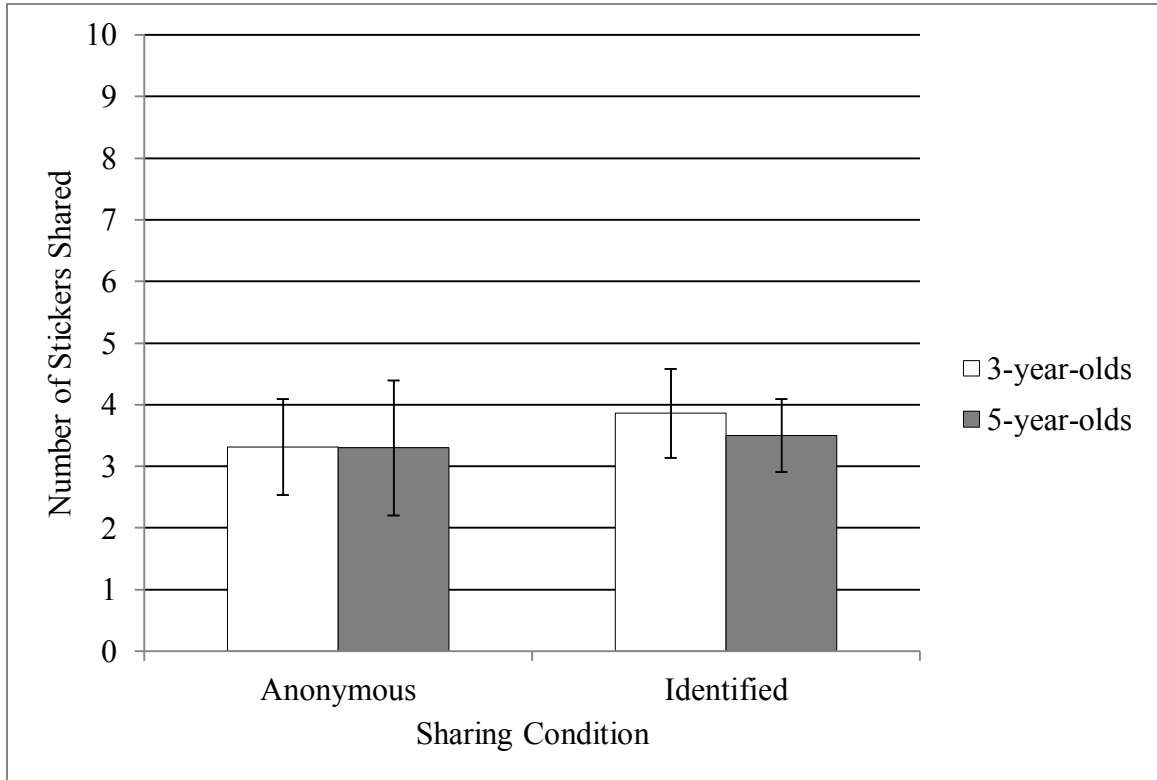
Figure 4.1   Plotted Interaction Between Children's Receiving Preferences and Sticker Predictions in E3 ($p = .052$). Children who preferred to receive from identified donors ($n = 60$) predicted that identified donors shared 7.92 stickers ($SE = 0.33$) and anonymous donors shared 5.10 stickers ($SE = 0.46$). Children who preferred to receive from anonymous donors ($n = 9$) predicted that identified donors shared 7.44 stickers ($SE = 0.86$) and anonymous donors shared 7.33 stickers ($SE = 1.19$). Standard error bars shown.
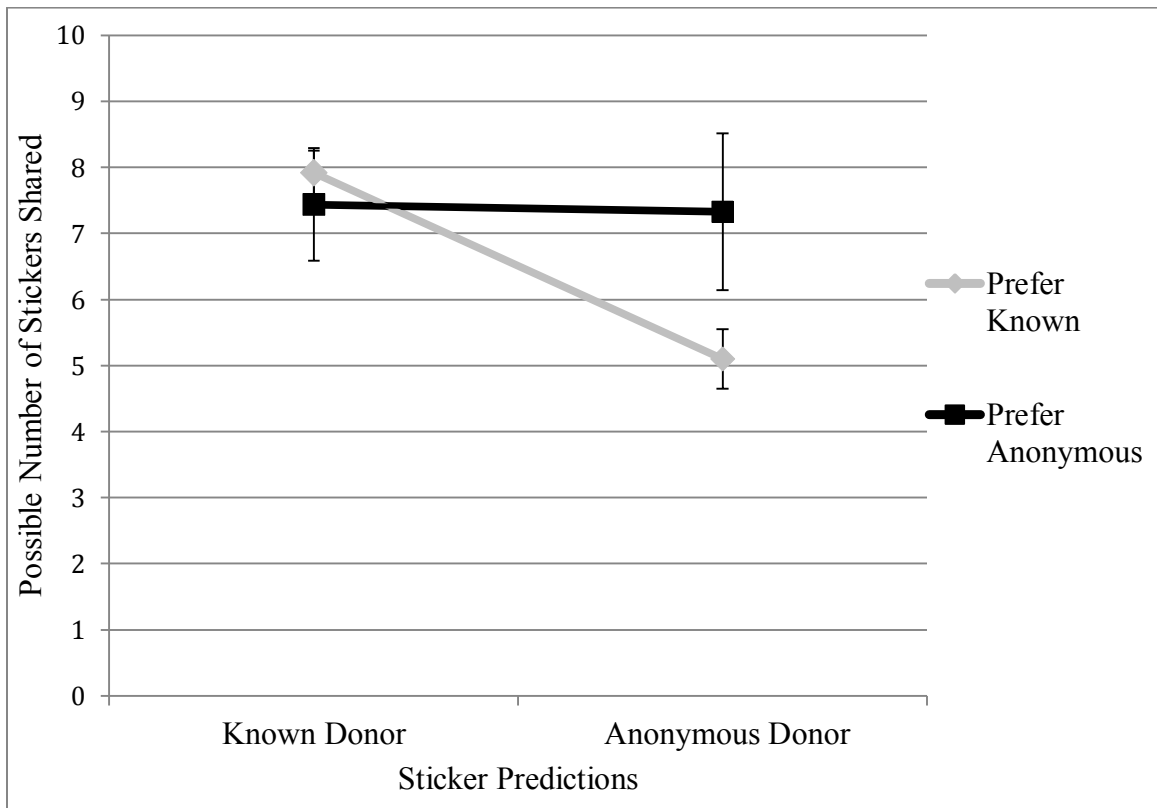
Figure 5.1. Sticker Sharing Across Sharing Condition in E4. A between-participants univariate ANOVA ($\alpha = .05$) with the Number of Stickers Shared as the dependent variable revealed no effect of sharing preference on sticker sharing ($p = .195$). Mean number of stickers shared was 3.27 ($SD = 2.67$) out of 10. Standard error bars are presented.
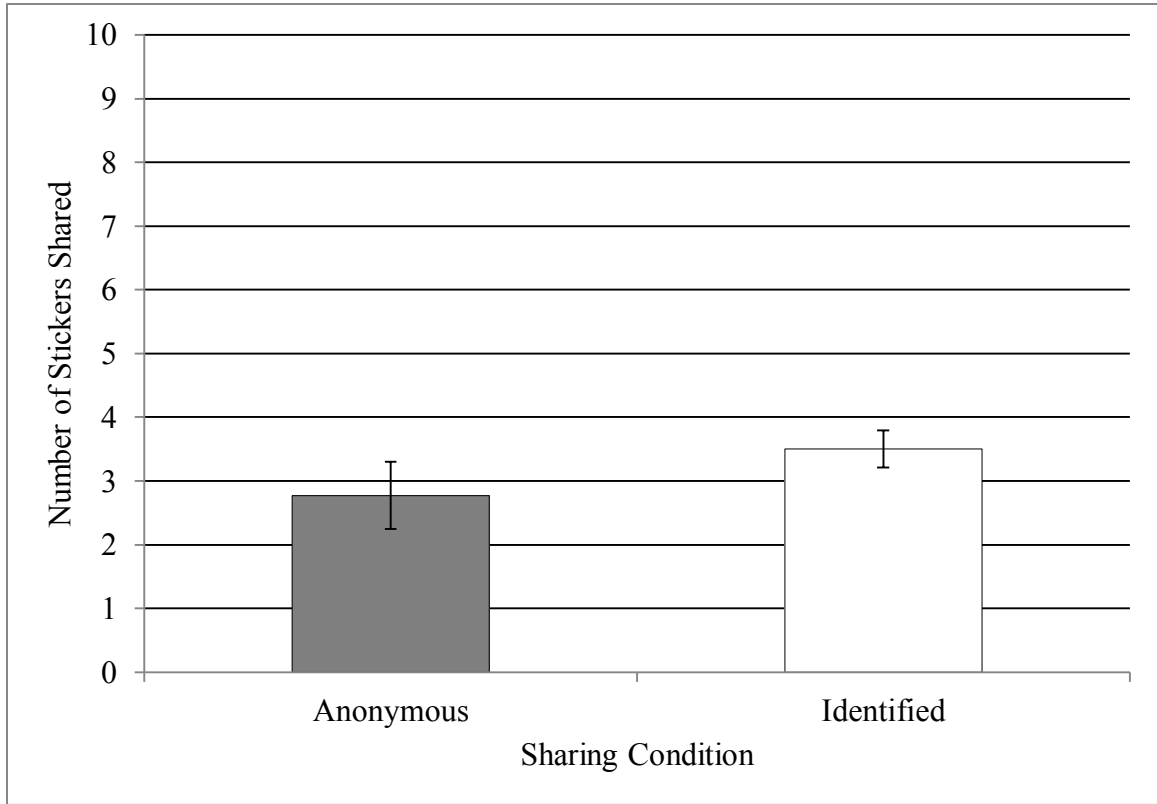
**Appendix A₁: Experiment 1 Protocol for 3-Year-Olds Anonymous Sharing Condition**

EXPERIMENT: Experiment 1   **SHARING CONDITION:** Anonymous
AGE GROUP: 3-year-olds   **COUNTERBALANCE:** n/a

Participant ID: _____   Age: (y___); (m___)   Sex: M or F

DOB: ____/____/____   Current Date: ____/____/____

Prior to experiment beginning:

Set up: video on; PRESS RECORD.
Set up ziplock bag of stickers, toys/markers/stamps/envelopes.

ASSENT: Hi [X]. Mom/Dad said that I could ask you to play a game with me. Would you like to do an activity with me? Great! Just tell me if you do not want to play anymore, and we will stop, okay?

Experiment Beings:

Okay, [X]. Let's play with the toys here. What do you want to play with? I want to know what 3-year-olds like to play with.

Free Play with 3 toys until child has a chance to play with them. Then, participant 'discovers' stickers.

Assess interest:
Do you like these stickers?
Here. I want you to have these (*gesture to stickers*). Let me find an envelope for you to put them in.
Let's put your name on your envelope so we know these are your stickers now.

Draw a picture.

Introduce sharing opportunity:
You know, if you <u>want</u> to, you can share your stickers with another child, Casey, who didn't get to come into the lab today. You could mail Casey however many stickers you want - you can share <u>some</u> stickers, <u>all</u> the stickers, or <u>no</u> stickers.
I'll put Casey's name and address on this envelope.

If Casey gets an envelope that says, from [X], Casey would know this envelope is from you, right?

What if I have an envelope for Casey that does NOT say it's from you (*present second envelope*)... If Casey gets this envelope that does not say, from [X], Casey would NOT know this envelope is from you, right?

Let's go into the mailroom now.

Enter mailroom:
If I give Casey this envelope (*present anonymous envelope*) – will Casey know you sent it?
CORRECT RESPONSE: NO [*corrective feedback if needed*]

If I give Casey this envelope (*presents identified envelope*) – will Casey know you sent it?
CORRECT RESPONSE: YES [*corrective feedback if needed*]

Let's give Casey this envelope (*indicate the anonymous envelope*)

This is your envelope (*gesture toward participant's envelope*) and this is Casey's envelope (*gesture toward Casey's envelope*).
The stickers you want to share with Casey go in this envelope (*gesture toward anonymous envelope*).
The stickers you want to keep, go in your envelope (*gesture toward participant's envelope*).
You can share some stickers, all the stickers, or no stickers.
We'll mail Casey's envelope at the end, no matter what you decide.

Remember, I did not print "From [X]" on the envelope, so Casey will not know that you sent this envelope.
So, Casey will not know who sent this envelope, because it doesn't say from [X], right?

Manipulation Check Scoring Sheet

1. **Participant Envelope Check**: If you put stickers in the envelope that says [X], who keeps the stickers?

2. **Casey Envelope Check**: If you put stickers in the envelope that says *Casey*, who keeps the stickers?

3. **Anonymity Manipulation Check:** If you put stickers in this envelope, will Casey know the stickers are from you? ⑥ Yes   ⑥ **No**

Demonstrate how to open envelope.

Now you get to choose if you want to share stickers, or keep stickers.
I'll just wait here (*sit on chair outside mailroom*). If you need any help, just ask.

Appendix A$_{ii}$: Experiment 1 Protocol for 3-Year-Olds Identified Sharing Condition

EXPERIMENT: Experiment 1   **SHARING CONDITION:** Identified
AGE GROUP: 3-year-olds   **COUNTERBALANCE:** n/a

Participant ID: _____   Age: (y____); (m____)   Sex: M or F

DOB: ____/____/____   Current Date: ____/____/____

Prior to experiment beginning:

Set up: video on; PRESS RECORD.
Set up ziplock bag of stickers, toys/markers/stamps/envelopes.

ASSENT: Hi [X]. Mom/Dad said that I could ask you to play a game with me.   Would you like to do an activity with me? Great! Just tell me if you do not want to play anymore, and we will stop, okay?

Experiment Beings:

Okay, [X]. Let's play with the toys here. What do you want to play with? I want to know what 3-year-olds like to play with.

Free Play with 3 toys until child has a chance to play with them. Then, participant 'discovers' stickers.

Assess interest:
Do you like these stickers?
Here. I want you to have these (*gesture to stickers*). Let me find an envelope for you to put them in.
Let's put your name on your envelope so we know these are your stickers now.

Draw a picture.

Introduce sharing opportunity:
You know, if you <u>want</u> to, you can share your stickers with another child, Casey, who didn't get to come into the lab today. You could mail Casey however many stickers you want - you can share <u>some</u> stickers, <u>all</u> the stickers, or <u>no</u> stickers.
I'll put Casey's name and address on this envelope.

If Casey gets an envelope that says, from [X], Casey would know this envelope is from you, right?

What if I have an envelope for Casey that does NOT say it's from you (*present second envelope*)... If Casey gets this envelope that does not say, from [X], Casey would NOT know this envelope is from you, right?

Let's go into the mailroom now.

Enter mailroom:
If I give Casey this envelope (*present anonymous envelope*) – will Casey know you sent it?
CORRECT RESPONSE: NO [*corrective feedback if needed*]

If I give Casey this envelope (*presents identified envelope*) – will Casey know you sent it?
CORRECT RESPONSE: YES [*corrective feedback if needed*]

Let's give Casey this envelope (*indicate the identified envelope*)

This is your envelope (*gesture toward participant's envelope*) and this is Casey's envelope (*gesture toward Casey's envelope*).
The stickers you want to share with Casey go in this envelope (*gesture toward identified envelope*).
The stickers you want to keep, go in your envelope (*gesture toward participant's envelope*).
You can share some stickers, all the stickers, or no stickers.
We'll mail Casey's envelope at the end, no matter what you decide.

Remember, I printed "From [X]" on the envelope, so Casey will know that you sent this envelope.
So, Casey will know who sent this envelope, because it says from [X], right?

Manipulation Check Scoring Sheet

1. **Participant Envelope Check**: If you put stickers in the envelope that says [X], who keeps the stickers?

2. **Casey Envelope Check**: If you put stickers in the envelope that says *Casey*, who keeps the stickers?

3. **Anonymity Manipulation Check:** If you put stickers in this envelope, will Casey know the stickers are from you? ⓔ Yes ⓔ **No**

Demonstrate how to open envelope.

Now you get to choose if you want to share stickers, or keep stickers.
I'll just wait here (*sit on chair outside mailroom*). If you need any help, just ask.

EXPERIMENT: Experiment 1   **SHARING CONDITION:** Anonymous
AGE GROUP: 5-year-olds   **COUNTERBALANCE:** n/a

Participant ID: _____   Age: (y____); (m____)   Sex: M or F

DOB: ____/____/____   Current Date: ____/____/____

Prior to experiment beginning:

Set up: video on; PRESS RECORD.
Set up ziplock bag of stickers, toys/markers/stamps/envelopes.

ASSENT: Hi [X]. Mom/Dad said that I could ask you to play a game with me.   Would you like to do an activity with me? Great! Just tell me if you do not want to play anymore, and we will stop, okay?

Experiment Beings:

Okay, [X]. Let's play with the toys here. What do you want to play with? I want to know what 5-year-olds like to play with.

Free Play with 3 toys until child has a chance to play with them. Then, participant 'discovers' stickers.

Assess interest:
Do you like these stickers?
Here. I want you to have these (*gesture to stickers*). Let me find an envelope for you to put them in.
Let's put your name on your envelope so we know these are your stickers now.

Draw a picture.

Introduce sharing opportunity:
You know, if you <u>want</u> to, you can share your stickers with another child, Casey, who didn't get to come into the lab today. You could mail Casey however many stickers you want - you can share <u>some</u> stickers, <u>all</u> the stickers, or <u>no</u> stickers.
I'll put Casey's name and address on this envelope.
I'm not going to write *From* [X] on the envelope. So Casey will not know this envelope is from you.

Enter mailroom:
This is your envelope (*gesture toward participant's envelope*) and this is Casey's envelope (*gesture toward Casey's envelope*).
The stickers you want to share with Casey go in this envelope (*gesture toward anonymous envelope*).
The stickers you want to keep go in your envelope (*gesture toward participant's envelope*).
You can share some stickers, all the stickers, or no stickers.
We'll mail Casey's envelope at the end, no matter what you decide.

Address Envelopes:
I did not printed "From [X]" on the envelope, so Casey will not know that you sent this envelope.
So, Casey will not know who sent this envelope, because it doesn't say from [X], right?

Manipulation Check Scoring Sheet

1. **Participant Envelope Check**: If you put stickers in the envelope that says [X], who keeps the stickers?

2. **Casey Envelope Check**: If you put stickers in the envelope that says *Casey*, who keeps the stickers?

3. **Anonymity Manipulation Check:** If you put stickers in this envelope, will Casey know the stickers are from you?   ⊚ Yes   ⊚ **No**

Demonstrate how to open envelope.

Now you get to choose if you want to share stickers, or keep stickers.
I'll just wait here (*sit on chair outside mailroom*). If you need any help, just ask.

Appendix B_{ii}: Experiment 1 Protocol for 5-Year-Olds Identified Sharing Condition

EXPERIMENT: Experiment 1   **SHARING CONDITION:** Identified
AGE GROUP: 5-year-olds   **COUNTERBALANCE:** n/a

Participant ID: _____   Age: (y____); (m____)   Sex: M or F

DOB: ____/____/____   Current Date: ____/____/____

Prior to experiment beginning:

Set up: video on; PRESS RECORD.
Set up ziplock bag of stickers, toys/markers/stamps/envelopes.

ASSENT: Hi [X]. Mom/Dad said that I could ask you to play a game with me. Would you like to do an activity with me? Great! Just tell me if you do not want to play anymore, and we will stop, okay?

Experiment Beings:

Okay, [X]. Let's play with the toys here. What do you want to play with? I want to know what 5-year-olds like to play with.

Free Play with 3 toys until child has a chance to play with them. Then, participant 'discovers' stickers.

Assess interest:
Do you like these stickers?
Here. I want you to have these (*gesture to stickers*). Let me find an envelope for you to put them in.
Let's put your name on your envelope so we know these are your stickers now.

Draw a picture.

Introduce sharing opportunity:
You know, if you <u>want</u> to, you can share your stickers with another child, Casey, who didn't get to come into the lab today. You could mail Casey however many stickers you want - you can share <u>some</u> stickers, <u>all</u> the stickers, or <u>no</u> stickers.
I'll put Casey's name and address on this envelope.
I'm not going to write *From* [X] on the envelope. So Casey will not know this envelope is from you.

Enter mailroom:

This is your envelope (*gesture toward participant's envelope*) and this is Casey's envelope (*gesture toward Casey's envelope*).

The stickers you want to share with Casey go in this envelope (*gesture toward identified envelope*).

The stickers you want to keep go in your envelope (*gesture toward participant's envelope*).

You can share some stickers, all the stickers, or no stickers.

We'll mail Casey's envelope at the end, no matter what you decide.

Address Envelopes:

I printed "From [X]" on the envelope, so Casey will know that you sent this envelope.

So, Casey will know who sent this envelope, because it says from [X], right?

Manipulation Check Scoring Sheet

1. **Participant Envelope Check**: If you put stickers in the envelope that says [X], who keeps the stickers?

2. **Casey Envelope Check**: If you put stickers in the envelope that says *Casey*, who keeps the stickers?

3. **Anonymity Manipulation Check:** If you put stickers in this envelope, will Casey know the stickers are from you? ⑥ Yes   ⑥ **No**

Demonstrate how to open envelope.

Now you get to choose if you want to share stickers, or keep stickers.

I'll just wait here (*sit on chair outside mailroom*). If you need any help, just ask.

Appendix C_i: Experiment 2 Protocol for Anonymous Sharing Condition, Counterbalance A

EXPERIMENT: Experiment 2   **SHARING CONDITION:** Anonymous

AGE GROUP: 3- & 5- year-olds

COUNTERBALANCE: A (present identified envelope; then present anonymous envelope)

Participant ID: _____   Age: (y____); (m____)   Sex: M or F

DOB: ____/____/____   Current Date: ____/____/____

Prior to experiment beginning:

Set up: video on; record. Set up ziplock bag of stickers, toys/markers/stamps/envelopes.

ASSENT: Hi [X]. Mom/Dad said that I could ask you to play a game with me. Would you like to do an activity with me?
Great! Just tell me if you do not want to play anymore, and we will stop, okay?

Experiment Beings:

Okay, [X]. Let's play with the toys here. What do you want to play with? I want to know what 3-year-olds like to play with.

Free Play with 3 toys until child has a chance to play with them. Then, participant 'discovers' stickers.

Sticker Ownership:
Since you found these stickers, would you like to keep them for yourself?
Let's put your stickers in an envelope so we don't lose them (*present envelope*).
We can print your name and draw a picture on the envelope so that we know the envelope is yours, and that the stickers inside the envelope belong to you (*print participant's name on envelope*).

<u>Participant correctly identifies their own name:</u>   YES☐
      NO ☐

Introduce Casey:
I just remembered: another child named Casey was supposed to come into the lab today. But Casey didn't come here.

Introduce Sharing Opportunity:
If you want, you could share your stickers with Casey.

You can share all of your stickers, some of your stickers, or none of your stickers - however many you want.
No matter how you decide to share, I will make sure Casey gets the envelope.

Let me get Casey's envelope (*presents two envelopes with Casey's name printed on them*).
Both of these envelopes have Casey's name on it. This says Casey's name, and this says Casey's name.

<u>Assess Participants' Understanding of Anonymous Sharing</u>

Present Identified Envelope
This envelope says "from _____ (*participant's name*).
Do you see your name written on this envelope?
Whose name is on this envelope?/Who's that?
<u>Participant correctly identifies their own name</u>:   YES☐
        NO ☐
(*Provide corrective feedback if necessary*)

Present Anonymous Envelope
But what about this envelope?
It has Casey's name on it, but your name is not on it.
Do you see your name on it anywhere? Take a good look!
<u>Participant correctly identifies that their name is not on the envelope:</u> YES☐   NO ☐
(*Provide corrective feedback if necessary*)

Assigned to: Anonymous Sharing Condition
We do <u>not</u> want Casey to know the stickers are from you.
So which envelope do we use so that Casey does <u>not</u> know the stickers are from you?
Participant Correctly Selected the Anonymous Envelope**:**   YES☐
        NO ☐

        ☐Was this question (^) repeated once?
                If Yes, why was this question repeated?
                ☐ Child did not provide response first time question was asked.
                ☐ Child was not attending to experimenter/stimulus the first time.

Sticker Sharing:
Let's go into our sorting room.
Remember you can share as many stickers as you want (all, some, none).
Stickers you want to keep and take home with you, go in this envelope that says [*participant's name*].
Stickers you want to share with Casey go in this envelope (*gesture to Casey's envelope)*, and I'll give this envelope to Casey.

CHILD SHARED [   ] NUMBER OF STICKERS (out of 10).

EXPERIMENT: Experiment 2   **SHARING CONDITION:** Anonymous
AGE GROUP: 3- & 5-year-olds
COUNTERBALANCE: B (present anonymous envelope; then present identified envelope)

Participant ID: _____   Age: (y____); (m____)   Sex: M or F

DOB: ____/____/____   Current Date: ____/____/____

Prior to experiment beginning:

Set up: video on; record. Set up ziplock bag of stickers, toys/markers/stamps/envelopes.

ASSENT: Hi [X]. Mom/Dad said that I could ask you to play a game with me. Would you like to do an activity with me?
Great! Just tell me if you do not want to play anymore, and we will stop, okay?

Experiment Beings:

Okay, [X]. Let's play with the toys here. What do you want to play with? I want to know what 3-year-olds like to play with.

Free Play with 3 toys until child has a chance to play with them. Then, participant 'discovers' stickers.

Sticker Ownership:
Since you found these stickers, would you like to keep them for yourself?
Let's put your stickers in an envelope so we don't lose them (*present envelope*).
We can print your name and draw a picture on the envelope so that we know the envelope is yours, and that the stickers inside the envelope belong to you (*print participant's name on envelope*).

Participant correctly identifies their own name: YES☐
      NO ☐

Introduce Casey:
I just remembered: another child named Casey was supposed to come into the lab today.
But Casey didn't come here.

Introduce Sharing Opportunity:
If you want, you could share your stickers with Casey.

You can share all of your stickers, some of your stickers, or none of your stickers - however many you want.
No matter how you decide to share, I will make sure Casey gets the envelope.

Let me get Casey's envelope (*presents two envelopes with Casey's name printed on them*).
Both of these envelopes have Casey's name on it. This says Casey's name, and this says Casey's name.

<u>Assess Participants' Understanding of Anonymous Sharing</u>

Present Anonymous Envelope
But what about this envelope?
It has Casey's name on it, but your name is not on it.
Do you see your name on it anywhere? Take a good look!
<u>Participant correctly identifies that their name is not on the envelope:</u> YES☐   NO ☐
(*Provide corrective feedback if necessary*)

Present Identified Envelope
This envelope says "from _____ (*participant's name*).
Do you see your name written on this envelope?
Whose name is on this envelope?/Who's that?
<u>Participant correctly identifies their own name</u>:   YES☐
        NO ☐
(*Provide corrective feedback if necessary*)

Assigned to: Anonymous Sharing Condition
We do <u>not</u> want Casey to know the stickers are from you.
So which envelope do we use so that Casey does <u>not</u> know the stickers are from you?
Participant Correctly Selected the Anonymous Envelope**:**   YES☐
        NO ☐

        ☐Was this question (^) repeated once?
                If Yes, why was this question repeated?
                ☐ Child did not provide response first time question was asked.
                ☐ Child was not attending to experimenter/stimulus the first time.

Sticker Sharing:
Let's go into our sorting room.
Remember you can share as many stickers as you want (all, some, none).
Stickers you want to keep and take home with you, go in this envelope that says [*participant's name*].
Stickers you want to share with Casey go in this envelope (*gesture to Casey's envelope)*, and I'll give this envelope to Casey.

CHILD SHARED [   ] NUMBER OF STICKERS (out of 10).

Appendix D$_i$: Experiment 2 Protocol for Identified Sharing Condition, Counterbalance A

EXPERIMENT: Experiment 2   **SHARING CONDITION:** Identified
AGE GROUP: 3- & 5-year-olds
COUNTERBALANCE: A (present identified envelope; then present anonymous envelope)

Participant ID: _____   Age: (y____); (m____)   Sex: M or F

DOB: ____/____/____   Current Date: ____/____/____

Prior to experiment beginning:

Set up: video on; record. Set up ziplock bag of stickers, toys/markers/stamps/envelopes.

ASSENT: Hi [X]. Mom/Dad said that I could ask you to play a game with me. Would you like to do an activity with me?
Great! Just tell me if you do not want to play anymore, and we will stop, okay?

Experiment Beings:

Okay, [X]. Let's play with the toys here. What do you want to play with? I want to know what 3-year-olds like to play with.

Free Play with 3 toys until child has a chance to play with them. Then, participant 'discovers' stickers.

Sticker Ownership:
Since you found these stickers, would you like to keep them for yourself?
Let's put your stickers in an envelope so we don't lose them (*present envelope*).
We can print your name and draw a picture on the envelope so that we know the envelope is yours, and that the stickers inside the envelope belong to you (*print participant's name on envelope*).

Participant correctly identifies their own name: YES☐
        NO ☐

Introduce Casey:
I just remembered: another child named Casey was supposed to come into the lab today.
But Casey didn't come here.

Introduce Sharing Opportunity:
If you want, you could share your stickers with Casey.

You can share all of your stickers, some of your stickers, or none of your stickers - however many you want.
No matter how you decide to share, I will make sure Casey gets the envelope.

Let me get Casey's envelope (*presents two envelopes with Casey's name printed on them*).
Both of these envelopes have Casey's name on it. This says Casey's name, and this says Casey's name.

<u>Assess Participants' Understanding of Anonymous Sharing</u>

Present Identified Envelope
This envelope says "from _____ (*participant's name*).
Do you see your name written on this envelope?
Whose name is on this envelope?/Who's that?
<u>Participant correctly identifies their own name</u>:   YES☐
        NO ☐
(*Provide corrective feedback if necessary*)

Present Anonymous Envelope
But what about this envelope?
It has Casey's name on it, but your name is not on it.
Do you see your name on it anywhere? Take a good look!
<u>Participant correctly identifies that their name is not on the envelope:</u> YES☐   NO ☐
(*Provide corrective feedback if necessary*)

Assigned to: Identified Sharing Condition
We <u>want</u> Casey to know the stickers are from you.
So which envelope do we use so that Casey will know the stickers are from you?
Participant Correctly Selected the Identified Envelope**:**   YES☐
        NO ☐

        ☐Was this question (^) repeated once?
                If Yes, why was this question repeated?
                ☐ Child did not provide response first time question was asked.
                ☐ Child was not attending to experimenter/stimulus the first time.

Sticker Sharing:
Let's go into our sorting room.
Remember you can share as many stickers as you want (all, some, none).
Stickers you want to keep and take home with you, go in this envelope that says [*participant's name*].
Stickers you want to share with Casey go in this envelope (*gesture to Casey's envelope)*, and I'll give this envelope to Casey.

CHILD SHARED [   ] NUMBER OF STICKERS (out of 10).

EXPERIMENT: Experiment 2   **SHARING CONDITION:** Identified
AGE GROUP: 3-year-olds
COUNTERBALANCE: B (present anonymous envelope; then present identified envelope)

Participant ID: _____   Age: (y____); (m____)   Sex: M or F

DOB: ____/____/____   Current Date: ____/____/____

Prior to experiment beginning:

Set up: video on; record. Set up ziplock bag of stickers, toys/markers/stamps/envelopes.

ASSENT: Hi [X]. Mom/Dad said that I could ask you to play a game with me. Would you like to do an activity with me?
Great! Just tell me if you do not want to play anymore, and we will stop, okay?

Experiment Beings:

Okay, [X]. Let's play with the toys here. What do you want to play with? I want to know what 3-year-olds like to play with.

Free Play with 3 toys until child has a chance to play with them. Then, participant 'discovers' stickers.

Sticker Ownership:
Since you found these stickers, would you like to keep them for yourself?
Let's put your stickers in an envelope so we don't lose them (*present envelope*).
We can print your name and draw a picture on the envelope so that we know the envelope is yours, and that the stickers inside the envelope belong to you (*print participant's name on envelope*).

Participant correctly identifies their own name: YES☐
      NO ☐

Introduce Casey:
I just remembered: another child named Casey was supposed to come into the lab today.
But Casey didn't come here.

Introduce Sharing Opportunity:
If you want, you could share your stickers with Casey.

You can share all of your stickers, some of your stickers, or none of your stickers - however many you want.
No matter how you decide to share, I will make sure Casey gets the envelope.

Let me get Casey's envelope (*presents two envelopes with Casey's name printed on them*). Both of these envelopes have Casey's name on it. This says Casey's name, and this says Casey's name.

<u>Assess Participants' Understanding of Anonymous Sharing</u>

Present Anonymous Envelope
But what about this envelope?
It has Casey's name on it, but your name is not on it.
Do you see your name on it anywhere? Take a good look!
<u>Participant correctly identifies that their name is not on the envelope:</u> YES☐   NO ☐
(*Provide corrective feedback if necessary*)

Present Identified Envelope
This envelope says "from _____ (*participant's name*).
Do you see your name written on this envelope?
Whose name is on this envelope?/Who's that?
<u>Participant correctly identifies their own name</u>:   YES☐
        NO ☐
(*Provide corrective feedback if necessary*)

Assigned to: Identified Sharing Condition
We <u>want</u> Casey to know the stickers are from you.
So which envelope do we use so that Casey will know the stickers are from you?
Participant Correctly Selected the Identified Envelope**:**   YES☐
        NO ☐

        ☐Was this question (^) repeated once?
                If Yes, why was this question repeated?
                ☐ Child did not provide response first time question was asked.
                ☐ Child was not attending to experimenter/stimulus the first time.

Sticker Sharing:
Let's go into our sorting room.
Remember you can share as many stickers as you want (all, some, none).
Stickers you want to keep and take home with you, go in this envelope that says [*participant's name*].
Stickers you want to share with Casey go in this envelope (*gesture to Casey's envelope)*, and I'll give this envelope to Casey.

CHILD SHARED [   ] NUMBER OF STICKERS (out of 10).

Appendix E$_i$: Experiment 3 Protocol for Receiving Preferences, Counterbalance A

EXPERIMENT: Experiment 3   **AGE GROUP:** 5- & 6-year-olds
COUNTERBALANCE: A (participant selects preferred envelope, then ask questions)

Participant ID:_____   DOB:_____   Date: _____   Sex: M or F

Hi (*insert participant's name*)!

Script for participants who were recruited through the laboratory: Kids who came to our lab before you decided to share some stickers they got while they were here.
Script for participants who were recruited through schools: Kids from another school decided to share some stickers with you.

I have two envelopes with stickers inside, from two different kids.
You get to take <u>one</u> of these envelopes home with you!

Each kid had 10 stickers to share. They could share <u>some</u> of their stickers, <u>all</u> of them, or <u>none</u> of their stickers.

I don't know how many stickers either kid shared. So, I don't know how many stickers are in this envelope (*holds up one envelope*), or in this one (*holds up the other envelope*).

I <u>do</u> know that any stickers in <u>this</u> envelope are from Casey (*hold up one envelope*). Casey put his/her name on the back of this envelope because s/he wanted you to know that the stickers are from him/her (*briefly turn envelope around to show the words 'From Casey' printed on the back*).

This envelope is from another kid (*hold up other envelope*). I don't know who the stickers in this envelope are from because this kid did not print a name on the envelope (*briefly turn envelope around to show that there is no printing on the back*). This kid did not want you to know who the stickers are from.

Both Casey (*gesture to Casey's envelope*) and this kid (*gesture to other envelope*) could have put stickers in these envelopes to share.

Memory Check Question:
Which one is from Casey?   Correct   Wrong

Envelope Selection:
Which one do you want?   ANON   IDENTIFIED

Okay – now I'm going to ask you a few questions. There are no right or wrong answers. I just want to know what you think.

Question 1: Which envelope do you think has more stickers?   ANON   IDENTIFIED

Question 2: How many stickers do you think are in this one? (*show the selected envelope*).
*Predicted Number of Stickers in Anonymous Envelope:*_____
*Predicted Number of Stickers in Identified Envelope:*_____

Question 3: How many stickers do you think are in this one? (*show the envelope the participant did not select*).
*Predicted Number of Stickers in Anonymous Envelope:*_____
*Predicted Number of Stickers in Identified Envelope:*_____

Question 4: Which child do you think is nicer?   ANON   IDENTIFIED

I think you picked a good one! Here you go (*give participant the envelope s/he selected*).

_____

Acceptable prompts for Questions 1-4:
- Take your best guess.
- That's okay, make a guess.
- Remember each child only had 10 stickers so share, so how many out of 10 do you think s/he shared?

EXPERIMENT: Experiment 3   **AGE GROUP:** 5- & 6-year-olds
COUNTERBALANCE: B (ask questions, then participant selects preferred envelope)

Participant ID:_____   DOB:_____   Date: _____   Sex: M or F

Hi (*insert participant's name*)!

Script for participants who were recruited through the laboratory: Kids who came to our lab before you decided to share some stickers they got while they were here.
Script for participants who were recruited through schools: Kids from another school decided to share some stickers with you.

I have two envelopes with stickers inside, from two different kids.
You get to take one of these envelopes home with you!

Each kid had 10 stickers to share. They could share some of their stickers, all of them, or none of their stickers.

I don't know how many stickers either kid shared. So, I don't know how many stickers are in this envelope (*holds up one envelope*), or in this one (*holds up the other envelope*).

I do know that any stickers in this envelope are from Casey (*hold up one envelope*). Casey put his/her name on the back of this envelope because s/he wanted you to know that the stickers are from him/her (*briefly turn envelope around to show the words 'From Casey' printed on the back*).

This envelope is from another kid (*hold up other envelope*). I don't know who the stickers in this envelope are from because this kid did not print a name on the envelope (*briefly turn envelope around to show that there is no printing on the back*). This kid did not want you to know who the stickers are from.

Both Casey (*gesture to Casey's envelope*) and this kid (*gesture to other envelope*) could have put stickers in these envelopes to share.

Memory Check Question:
Which one is from Casey?   Correct   Wrong

Okay – now I'm going to ask you a few questions. There are no right or wrong answers. I just want to know what you think.

Question 1: Which envelope do you think has more stickers?   ANON   IDENTIFIED

Question 2: How many stickers do you think are in this one? (*show the selected envelope*).
*Predicted Number of Stickers in Anonymous Envelope:*_____
*Predicted Number of Stickers in Identified Envelope:*_____

Question 3: How many stickers do you think are in this one? (*show the envelope the participant did not select*).
*Predicted Number of Stickers in Anonymous Envelope:*_____
*Predicted Number of Stickers in Identified Envelope:*_____

Question 4: Which child do you think is nicer?   ANON   IDENTIFIED

Envelope Selection:
Which one do you want?   ANON   IDENTIFIED

I think you picked a good one! Here you go (*give participant the envelope s/he selected*).

Acceptable prompts for Questions 1-4:
- Take your best guess.
- That's okay, make a guess.
- Remember each child only had 10 stickers so share, so how many out of 10 do you think s/he shared?

Appendix F_i: Experiment 4 Protocol for Sharing Preferences, Counterbalance A

EXPERIMENT: Experiment 4   **AGE GROUP:** 5- & 6-year-olds
COUNTERBALANCE: A (first describe identified sharing, then anonymous sharing)

Participant ID:_____ DOB:_____ Date: _____   Sex: M or F

Hi (*insert participant's name*)!

Do you remember, when I was in your classroom, I said you'd get to do something fun with me? Well, I'm going to tell you why it's fun: you get to have 10 stickers! That's pretty great!

Here they are! Let's see; you have 10 stickers (*count out the stickers*).

Here's an envelope for you to put your stickers in, to take them home (*present envelope*). I'll put your name on it (*print participant's name on envelope*).
So, this will be yours to take home.

Guess what? If you want, you can share your stickers with another kid named Alex. All you'd have to do is put the stickers you want to share with Alex, inside Alex's envelope, like this. *Present another envelope with the name 'Alex' printed on it. Demonstrate how to open the envelope and put stickers inside.*

You could share <u>some</u> of your stickers with Alex, <u>all</u> of them, or <u>none</u> of them. I'll take this to Alex (*gesture to envelope*), but I won't look inside, so I won't know if you shared or not.

Remember, these stickers are yours now – so it's up to you if you want to share them with Alex, okay? There are two ways you can share your stickers.

Sharing as an Identified Donor:
One way to share is to put your name on the envelope, like this, so that when Alex sees this envelope, s/he will know this is from you (*print participant's name on one envelope*).

Sharing as an Anonymous Donor:
The other way to share is to <u>not</u> put your name on the envelope, like this, so that when Alex sees this envelope, s/he will <u>not</u> know this is from you, and I won't tell him/her. (*present another envelope and leave it blank*)

<u>*Which envelope do you want to give to Alex?*</u>
This one with your name on it (*hold up the envelope with participant's name printed on it*)?
Or this one without your name on it (*hold up the blank envelope*)?   **Anon**   **Identified**

Question 1: Will Alex know the envelope is from you when s/he sees this (*present envelope the participant selected*)?   **Correct   Wrong**

You're right – Alex will/will not know the envelope is from you.
[Or]
Actually Alex will/will not know the envelope is from you.
Do you still want to use this envelope, or do you want to change your mind?
              Kept Original   **Changed to   [Anon] or   [Known]**

Sticker Sharing Opportunity:
Now it's time to share stickers, if you want.
I'm not going to look, because – remember! - you can share as many stickers as you want with Alex (some, all, or none). It's up to you.

If you want to keep stickers, put them in this envelope with your name on it (*gesture to the participant's envelope*).

If you want to share stickers with Alex, put them in this envelope (*gesture to the anonymous or identified envelope that the participant selected*).

Do you have any questions?
Okay – go ahead and put the stickers in here to keep them (*gesture to participant's envelope*), or in here to share them (*gesture to Alex's envelope*).

Number of Stickers Shared (out of 10): _____

Replication of E3

Oh! I almost forgot!
Some other kids from another school decided to share some stickers with you.

I have two envelopes with stickers inside, from two different kids.
You get to take one of these envelopes home with you!

Each kid had 10 stickers to share. They could share some of their stickers, all of them, or none of their stickers.

I don't know how many stickers either kid shared. So, I don't know how many stickers are in this envelope (*holds up one envelope*), or in this one (*holds up the other envelope*).

I do know that any stickers in this envelope are from Casey (*hold up one envelope*). Casey put his/her name on the back of this envelope because s/he wanted you to know that the stickers are from him/her (*briefly turn envelope around to show the words 'From Casey' printed on the back*).

This envelope is from another kid (*hold up other envelope*). I don't know who the stickers in this envelope are from because this kid did not print a name on the envelope (*briefly turn envelope around to show that there is no printing on the back*). This kid did not want you to know who the stickers are from.

Both Casey (*gesture to Casey's envelope*) and this kid (*gesture to other envelope*) could have put stickers in these envelopes to share.

Memory Check Question:
Which one is from Casey?   Correct   Wrong

Okay – now I'm going to ask you a few questions. There are no right or wrong answers.
I just want to know what you think.

Question 1: Which envelope do you think has more stickers?   ANON IDENTIFIED

Question 2: How many stickers do you think are in this one? (*show the selected envelope*).
Predicted Number of Stickers in Anonymous Envelope:_____
Predicted Number of Stickers in Identified Envelope:_____

Question 3: How many stickers do you think are in this one? (*show the envelope the participant did not select*).
Predicted Number of Stickers in Anonymous Envelope:_____
Predicted Number of Stickers in Identified Envelope:_____

Question 4: Which child do you think is nicer?   ANON   IDENTIFIED

Envelope Selection:
Which one do you want?   ANON   IDENTIFIED

I think you picked a good one! Here you go (*give participant the envelope s/he selected*).

--
Acceptable prompts for Questions 1-4:
Take your best guess. [or]   That's okay, make a guess. [or]
Remember each child only had 10 stickers so share, so how many out of 10 do you think s/he shared?

Appendix F_{ii}: Experiment 4 Protocol for Sharing Preferences, Counterbalance B

EXPERIMENT: Experiment 4   **AGE GROUP:** 5- & 6-year-olds
COUNTERBALANCE: B (first describe anonymous sharing, then identified sharing)

Participant ID:_____ DOB:_____ Date: _____   Sex: M or F

_____

Hi (*insert participant's name*)!

Do you remember, when I was in your classroom, I said you'd get to do something fun with me? Well, I'm going to tell you why it's fun: you get to have 10 stickers! That's pretty great!

Here they are! Let's see; you have 10 stickers (*count out the stickers*).

Here's an envelope for you to put your stickers in, to take them home (*present envelope*). I'll put your name on it (*print participant's name on envelope*).
So, this will be yours to take home.

Guess what? If you want, you can share your stickers with another kid named Alex. All you'd have to do is put the stickers you want to share with Alex, inside Alex's envelope, like this. *Present another envelope with the name 'Alex' printed on it. Demonstrate how to open the envelope and put stickers inside.*

You could share <u>some</u> of your stickers with Alex, <u>all</u> of them, or <u>none</u> of them. I'll take this to Alex (*gesture to envelope*), but I won't look inside, so I won't know if you shared or not.

Remember, these stickers are yours now – so it's up to you if you want to share them with Alex, okay? There are two ways you can share your stickers.

Sharing as an Anonymous Donor:
The other way to share is to <u>not</u> put your name on the envelope, like this, so that when Alex sees this envelope, s/he will <u>not</u> know this is from you, and I won't tell him/her. (*present another envelope and leave it blank*)

Sharing as an Identified Donor:
One way to share is to put your name on the envelope, like this, so that when Alex sees this envelope, s/he will know this is from you (*print participant's name on one envelope*).

<u>Which envelope do you want to give to Alex?</u>
This one with your name on it (*hold up the envelope with participant's name printed on it*)?
Or this one without your name on it (*hold up the blank envelope*)?   **Anon   Identified**

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<u>Question 1</u>: Will Alex know the envelope is from you when s/he sees this (*present envelope the participant selected*)?   **Correct   Wrong**

You're right – Alex will/will not know the envelope is from you.
[Or]
Actually Alex will/will not know the envelope is from you.
Do you still want to use this envelope, or do you want to change your mind?
            Kept Original   **Changed to   [Anon] or   [Known]**

Sticker Sharing Opportunity:
Now it's time to share stickers, if you want.
I'm not going to look, because – remember! - you can share as many stickers as you want with Alex (some, all, or none). It's up to you.

If you want to keep stickers, put them in this envelope with your name on it (*gesture to the participant's envelope*).

If you want to share stickers with Alex, put them in this envelope (*gesture to the anonymous or identified envelope that the participant selected*).

Do you have any questions?
Okay – go ahead and put the stickers in here to keep them (*gesture to participant's envelope*), or in here to share them (*gesture to Alex's envelope*).

Number of Stickers Shared (out of 10): _____

Replication of E3

Oh! I almost forgot!
Some other kids from another school decided to share some stickers with you.

I have two envelopes with stickers inside, from two different kids.
You get to take <u>one</u> of these envelopes home with you!

Each kid had 10 stickers to share. They could share <u>some</u> of their stickers, <u>all</u> of them, or <u>none</u> of their stickers.

I don't know how many stickers either kid shared. So, I don't know how many stickers are in this envelope (*holds up one envelope*), or in this one (*holds up the other envelope*).

I <u>do</u> know that any stickers in <u>this</u> envelope are from Casey (*hold up one envelope*). Casey put his/her name on the back of this envelope because s/he wanted you to know that the stickers are from him/her (*briefly turn envelope around to show the words 'From Casey' printed on the back*).

This envelope is from another kid (*hold up other envelope*). I don't know who the stickers in this envelope are from because this kid did not print a name on the envelope (*briefly turn envelope around to show that there is no printing on the back*). This kid did not want you to know who the stickers are from.

Both Casey (*gesture to Casey's envelope*) and this kid (*gesture to other envelope*) could have put stickers in these envelopes to share.

Memory Check Question:
Which one is from Casey?   Correct   Wrong

Okay – now I'm going to ask you a few questions. There are no right or wrong answers.
I just want to know what you think.

Question 1: Which envelope do you think has more stickers?   ANON IDENTIFIED
Question 2: How many stickers do you think are in this one? (*show the selected envelope*).
Predicted Number of Stickers in Anonymous Envelope:_____
Predicted Number of Stickers in Identified Envelope:_____

Question 3: How many stickers do you think are in this one? (*show the envelope the participant did not select*).
Predicted Number of Stickers in Anonymous Envelope:_____
Predicted Number of Stickers in Identified Envelope:_____

Question 4: Which child do you think is nicer?   ANON   IDENTIFIED

Envelope Selection:
Which one do you want?   ANON   IDENTIFIED

I think you picked a good one! Here you go (*give participant the envelope s/he selected*).

--
Acceptable prompts for Questions 1-4:
Take your best guess.   [or]   That's okay, make a guess. [or]   Remember
each child only had 10 stickers so share, so how many out of 10 do you think s/he shared?