Help-Seeking As A Cause of Young Children's Collaboration

Christopher Vredenburgh (cv92@cornell.edu)
Department of Human Development, Cornell University
Ithaca, NY, 14850, USA

Tamar Kushnir (tk397@cornell.edu)
Department of Human Development, Cornell University
Ithaca, NY, 14850, USA

Abstract

Young children's collaboration is a topic of great interest, yet what causes children to initiate collaboration in some circumstances but not others is unclear. In this research, we analyzed preschoolers' collaboration as an information gathering activity in a toy assembly activity. We independently assessed children's competency at a similar building task and, using a separate group of children, the difficulty of each step of the activity. We hypothesized that children would request collaborative assistance when they needed assistance (that is, when they were less competent and/or the task was more difficult), but act independently when capable. The results confirmed that preschoolers were more likely to request collaborative assistance as the difficulty of the activity increased and more so if they were initially less competent. The results suggest that preschoolers' collaboration may be profitably viewed as an information gathering activity.

Keywords: Collaboration; help-seeking; social learning; preschool children; play.

Introduction

Recently, there has been considerable interest in children's early-emerging social learning abilities, including their reliance on social information (Koenig & Harris, 2005) and their propensity to learn through collaboration (Duran & Gauvain, 1993; Foley, Ratner, & House, 2002; Paradise & Rogoff, 2009; Sommerville & Hammond, 2007). Indeed, it has even been argued that these social learning abilities, in particular collaboration and the psychological motivations underlying collaboration, are what distinguish humans from nonhuman primates (Tomasello, Call, Behne, & Moll, 2005).

Recent research on children's collaboration has emphasized the importance of children's tendency to appreciate joint goals and commitment to collaborators. This research has demonstrated that children collaborate even when doing so does not gain them any explicit benefits (Warneken, Gräfenhain, & Tomasello, 2012). Nonetheless, what causes children to initiate collaboration is still widely debated. Researchers have proposed a range of factors that highlight complementary processes that are generally consistent with one another (Tomasello et al 2005). The range of suggested factors includes a general motivation to share cognitive states with others, a "curiosity" to understand psychological and physical causes, and a social game theoretic distinctively rewarding to humans (Tomasello et al, 2005). These possible causes are clearly not mutually exclusive. Moreover, many of them make a similar prediction: when children are offered the opportunity to involve others in tasks, they will do so regardless of whether they need help at all.

Intriguingly, research on people's help-seeking could shed light on why children collaborate in some circumstances, but not all. Specifically, help-seeking involves a help seeker signaling to a helper a desire for them to assist in attaining a goal. Help-seeking often occurs when an individual is not confident in their ability to independently complete the task (Nelson-Le Gall et al, 1990). Interestingly, requests for assistance can result in a range of collaborative exchanges of information and action. For instance, responses can vary from indirect verbal hints that facilitate the help seeker to direct coordination of actions between the help seeker and helper. Indeed, help seekers often prefer to avoid receiving too much help, so as to remain actively involved (Nelson-Le Gall, 1986). Thus, help-seeking generally occurs in relation to uncertainty about independently carrying out the task, and can lead to a variety of collaborative exchanges of information and action.

In this research, we examined children's help-seeking as a proximate cause of collaboration that may contribute to children's learning. From this perspective, children face information gathering trade-offs in acting alone versus collaborating. Relatedly, empirical studies show that children often prefer to play on their own, and indeed there are learning benefits to such autonomous exploration (Schulz & Bonawitz, 2007). Children at times learn more from acting than from watching someone else perform an action (Berry, 1991; Sommerville, Hildebrand & Crane, 2008; Kushnir, Wellman, & Gelman, 2009). However, when a child is cognitively or motorically unable to perform an activity, they gain little or no information by acting. Therefore, in this case the child may seek assistance instead of struggling alone. We hypothesized that, rather than always involving others in their play, children will be more likely to request collaborative assistance only when they need assistance. More specifically, we ask whether the difficulty of the activity and the competence of the individual child will predict changes in the frequency and nature of their collaborative interactions.

The empirical investigation of our hypotheses required permitting children to choose to act independently or request collaborative assistance. In permitting children to act spontaneously, we needed to form and apply definitions of collaboration in our coding scheme. To do this, we referenced past research on children's collaboration to attempt to remain consistent in the definition of the phenomenon. In past research, collaboration has been defined as actively coordinating actions, verbally planning towards a goal, and taking turns with another person (Foley, Ratner, & House, 2002; Warneken, Chen, & Tomasello, 2012). As is described below, we adopted the standard that in order for an event to be described as collaborative, the child needed to coordinate actions and/or verbally plan with the collaborator. Furthermore, to account for and analyze the varied involvement of the child and collaborator in their spontaneous interactions, we ranked each interaction using defined levels of collaboration, as described below.

Our empirical investigation also required an activity which had multiple parts, each with different degrees of difficulty, and measured children's ability to independently complete the activity. To this end, we designed a toy assembly task in which children built toys by following sequences of instructive pictures. To assess children's initial competency children completed an Assessment Toy that provided an estimate of their ability to independently construct the toys, termed the Competency Score. To assess the difficulty of the stimuli, a group of children constructed all of the toys independently without help, and were scored on their ability to complete each step. In this way, we measured the two factors we hypothesized to contribute to children's initiation of collaboration.

Method

Participants. Participants were forty preschoolers (M= 52.44 months, SD= 9.7 months; twenty-one females). Children were recruited from preschools and from a database of research participants whose parents expressed interest in participating in research. The children were all from the surrounding region of a rural university town and were predominantly Caucasian and middle class. Three additional children were excluded from the final sample; one due to experimenter error, one due to uncooperativeness, and one due to teacher interruption.

Stimuli. The stimuli were Edushape Interstar rings. In the current experiment, numerous rings were connected with one another so as to resemble larger objects. Children were shown laminated instructive pictures depicting each step of construction for four different toys.

Apparatus. Testing sessions occurred at a child-sized table in a quiet room in the laboratory or in a quiet room in the child's preschool. The interactions were recorded with two Sony DCR-SR68 digital cameras.

Procedure

Warm-up Toy. The Warm-up Toy, termed the Key, was completed to teach children how to manipulate the toy pieces and make them look like the instructive pictures. The experimenter told the child that they had some toys and some pictures, and they could make the toys look like the pictures. The experimenter told the child to watch him/her as they completed the first step. After completing the first step, the experimenter asked the child, "Does that look like the picture?" If the child said no, the experimenter explained that the color, position, and number of pieces all made it look like the picture. The child and experimenter then took turns making the Key. Corrective feedback was given for mistakes.

Assessment Toy. Next the child completed an Assessment Toy, termed the Boat, which provided a graded assessment of the child's competence in independently constructing the toys as shown in the instructive pictures. The experimenter asked the child to do the Boat independently, saying, "You can do this one by yourself by making it look like the picture. Start with the first picture. Each time you need a new picture, just move the picture. Now go ahead and make it look like the picture." As the child completed the Boat, the experimenter quietly watched the child and did not provide assistance or corrective feedback. The child had up to five minutes to complete the Boat.

Test Toys. The child then completed the two Test Toys, Sally and Sally's House. Twenty-two of the children were randomly sorted into the Collaboration Group and eighteen into the Non-collaboration Group. In both conditions, half of the children did Sally first and half did Sally's House first. Children had as long as needed to finish the Test Toys.

In the Collaboration Group, the experimenter looked at the child and said, "Now I can help you make Sally, so just let me know when you want me to do some, OK? So if you want help, I'm right here." The experimenter sat and watched, and did not intervene or provide any sort of verbal feedback unless the child initiated collaboration (see "Collaborative Responses" below for details on how the experimenter responded to bids).

In the Non-collaboration Group, the experimenter said, "You can do this one by yourself by making it look like the picture. Now go ahead and make it look like the picture." The experimenter sat quietly and watched the child complete the toy. The experimenter did not intervene or provide any sort of verbal feedback, and responded to requests for assistance as in the Assessment Toy.

Bids for Collaboration. Based on prior work and our own pilot observations in preschools, children initiate collaboration by establishing eye contact, remarking that the activity is difficult, and directly asking for assistance. We therefore accepted these as bids for collaboration. The experimenter responded to 2 seconds of eye contact and remarks of difficulty by asking, "Do you want me to help?" If the child declined assistance, no collaboration occurred. If the child assented, the experimenter collaborated. The experimenter responded to direct requests for assistance by collaborating with the child without further questioning.

Limits of Collaboration. The experimenter always provided helpful, unhesitating, and accurate assistance. The experimenter collaborated for a single step at a time, unless the child asked for further assistance on the following step. If the child asked the experimenter not to intervene further, the experimenter stopped collaborating. If the child had made mistakes in steps prior to the one at which they asked for assistance, the experimenter aided in correcting the past mistakes. In this way, the experimenter did not condone errors, functioned as an ecologically valid adult collaborator, and avoided the potential complication of inconsistent experimenter responses across children to vague requests for assistance.

Collaborative Responses. If the child structured the experimenter's response by specifying a particular motoric or cognitive difficulty, the experimenter addressed the particular problem. For example, if the child was struggling to fit two pieces together and commented that it was difficult to put them together, the experimenter assisted the child in pushing them together. In this case, both the child and experimenter would be involved in physically fitting them together. If the child simply asked if one piece went on top of the other, the collaborator provided the information and permitted the child to physically carry out the actions. In response to vague requests for collaboration without child action, for instance looking at the step and stating "This is too hard," the experimenter gathered the correct pieces, carried out the step, and provided an explanation. Likewise, if the child simply asked for verbal clarification, the experimenter's response was limited to verbal clarification. In this way, the experimenter's collaboration was contingent upon the extent to which the child structured it.

Coding

Children's Competency- Assessment Toy (Boat). We assessed children's competency in constructing the Assessment Toy. Five parameters assessed for each step of the toys whether children: (1) added the correct number of pieces, (2) made the correct number of connections with those pieces, (3) made the correct type of connection(s), (4) added pieces of the correct color(s), and (5) connected the pieces to the correct part of the existing structure. For each step, children earned from 0-5 points; each parameter was worth a minimum of 0 and a maximum of 1 point. Partial credit (e.g. ½ points) was given for partial completion. Children's performance score on each step of the Assessment Toy therefore had a minimum of 0 and a maximum of 5 multiplied by the toy's number of steps (8 steps; range 0-40).

Children's performance on the Test Toys (Sally and Sally's House) during collaboration. The same coding as above was used to assess children in the Collaboration Group as they completed the Test Toys. Once again, children's performance score for each Test Toy had a minimum of 0 and a maximum of 5 multiplied by the toy's number of steps (10 steps each; range 0-50).

Step difficulty of the Test Toys (Sally and Sally's House). The Non-Collaboration Group's competency on each step of the test toy construction was used as a means of computing the difficulty of the Test Toys' steps in the absence of collaboration. The scoring was the same 0 to 5 scale that was used to measure children's competency during assessment. But, this time we did not sum across steps; instead we used the average competency of the Non-Collaboration group at each step as an index of step difficulty in our analysis (below). .

Collaboration initiated?: A binary response code for each step on which children in the Collaboration Group initiated any collaboration. Reliability coding performed on 55% of the sample produced 100% concordance.

Level of collaboration: For the Collaboration Group, collaborative interactions at each step were rank-ordered in five categories from lowest to highest levels of collaborative assistance: (0) no collaboration, (1) the child performed the action and the experimenter provided verbal feedback about the child's action, (2) the child provided information about how the pieces assemble and the experimenter performed the action, (3) both the child and the experimenter provided information about how the pieces are assembled and both were involved in assembling them, and (4) the experimenter performed the actions and provided the information about how the pieces are assembled. If multiple levels of collaboration were present during one step, the step was coded by the highest level present. Reliability coding performed on 55% of the sample produced 92% concordance, indicating high reliability.

Results

Children's Competency. Overall, on the Assessment Toy children averaged a Competency Score of 29.83 out of 40 with a standard deviation of 10.49. There were no systematic differences at assessment between children in each group (Collaboration: M = 30.17, Non-collaboration: M = 29.84, $t(38)$ = .591, p = *ns*). Thus, our entire sample of children displayed sufficient variation in competency to further investigate our hypotheses.

Collaboration Initiated. Our hypothesis predicted that children would collaborate when they were unable to perform the activity independently, and conversely that they would not collaborate when they could construct the toys independently. Our principal analysis therefore assessed whether the difficulty of the Test Toy steps, as measured by the Non-collaboration Group's average performance, and children's competence, as measured by children's Competency Scores, predicted children's choices to collaborate. There were no order effects (Sally first vs. Sally's House first) in either the Collaboration or Non-collaboration Group, so results were collapsed across order for further analysis.

In assessing our predictions of children's collaboration, we needed to properly account for the dependence amongst children's repeated measurements at each step. We therefore employed a General Estimating Equation (GEE), which is a common form of logistic regression analysis, with children as the repeated effect.

Our first dependent variable was the binary variable: whether children selected to collaborate on each step (1 = yes, 0 = no). We first performed an analysis with step difficulty, children's Competency Scores, age, and toy type (Sally =0, Sally's house = 1) as the predictors. We included children's gender as a factor (female = 0, male = 1). According to the model, the log of the odds of a child collaborating was significantly positively related to step difficulty (p = .000) and significantly negatively related to children's competence (p = .001). As depicted in Table 1, neither age, gender, nor the particular toy related to children's collaboration. This indicates that when the step was more difficult and the child less competent, children were significantly more likely to collaborate than act independently. Similarly, when the steps were simple and the child competent, children were more likely to act independently.

However, it was possible that children selected to collaborate more as they became tired of the activity as opposed to the difficulty of the steps. We performed a second GEE analysis with toy step and step difficulty as the predictors, and collaboration as the dependent variable. Step difficulty was a statistically significant predictor of collaboration, but toy step was not (Step difficulty: β = .717, Wald's $\chi 2$ = 20.345, p = .000; Step: β = -.003, Wald's $\chi 2$ = .017, p = .896). This result helped to specify that step difficulty, as opposed to the order of the toy steps and/or ordering of the toys, related to children's collaboration.

Table 1: Cumulative Logistic Regression Analysis of Children's Choices to Collaborate

Predictor	β	*SE* β	Wald's χ2	*P*	OR
Constant	6.01	2.88	4.34	.00***	405.48
Toy	-.05	.34	.02	.89	.95
Gender	.00	.73	.00	.90	1.00
Step Difficulty	.84	.14	36.18	.00***	2.31
Compete-ncy	-.08	.02	10.39	.00***	.93
Age	-.41	.62	.44	.51	.66

Table 1: Table 1 shows the results of the parameter estimates for a logistic regression analysis performed with a General Estimating Equation. The model assesses which variables relate to children's choice to collaborate or act independently. Toy (Sally = 0, Sally's House = 1) and gender (female = 0, male = 1) were entered as factors. Step difficulty, competency, and children's age were entered as covariates. Degrees of freedom = 1.

**** Indicates statistically significant at the .001 level.*

While these logistic regression results were encouraging, we desired a direct assessment of how the two factors in our conceptual model of collaboration compared with children's observed behavior. To do so, we divided the children into three categories of competency and the steps into three categories of difficulty. The majority of children had a Competency Score in the range of 35-40 out of a maximum of 40, with only one child scoring below 10. We therefore developed the following categories of Competency Scores: Less Competent (0-20), More Competent (21-35), and Very Competent (36-40). As for step difficulty, the lowest step score was 1.87 and the majority of step scores were above 3.5. To account for the lack of difficult steps, we defined the following three categories of step difficulty: Simple (0-1.0), Somewhat Difficult (1.1-2.0), and More Difficult (2.1-5).

Based on the categories defined above, we calculated the observed probability of children collaborating for each category of competency and difficulty. The observed probabilities are displayed in the line graph in Figure 1a. As shown, collaboration was more likely as the step difficulty increased and children's competency decreased. This result was consistent with our hypotheses.

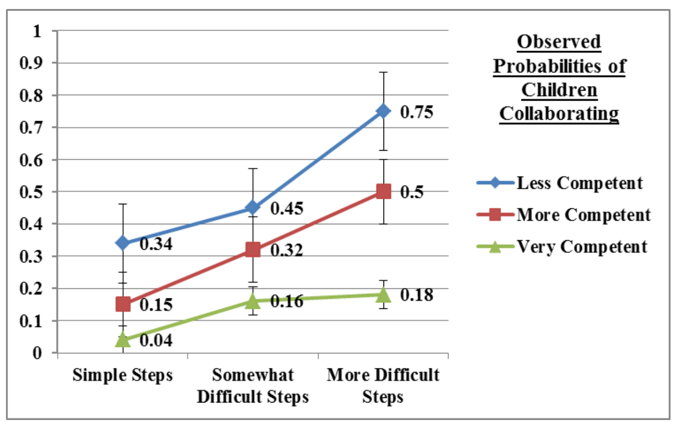

Figure 1a: Children were categorized into three competency categories and the toy steps into three difficulty categories. The graph shows children's observed probability of collaboration for each category of children and steps. Standard error bars are displayed.

We were unable to assess a GEE model based on categorical variables representing the categories because some of the cells would contain 0 (the less competent group's children collaborated on all of the more difficult steps). Instead, we assessed how our statistical logistic GEE model's predictions, based on the continuous values of competency and step difficulty, compared with the observed probabilities. Critically, this provides evidence as to how well the occurrence of children's collaboration coheres with the two factors in our conceptual model: step difficulty (represented by "D" below) and competency (represented by

"C" below). Computing the probabilities from the logistic GEE model consisted of applying the following equation:

$$P = e^{\text{Constant} + .D*M_D + C*M_C} / (1+ e^{\text{Constant} + .D*M_D + C*M_C})$$

We selected the means (represented by "M" above) of the observed values of each category to be the representative covariate values. We then computed the probability of collaboration using the parameter estimates provided by the logistic GEE model. The results are displayed in Figure 1b.

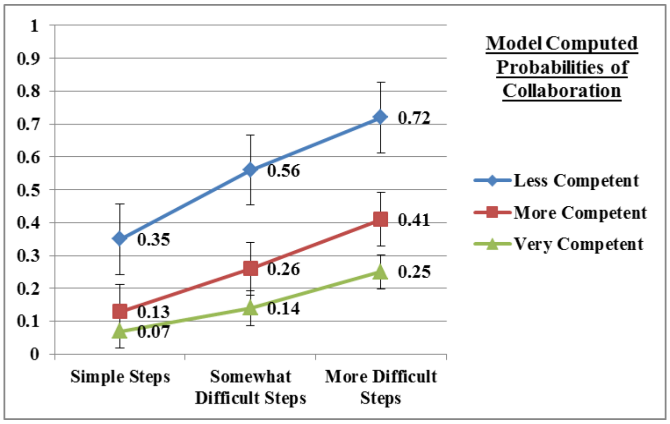

Figure 1b: As outlined in the text, three categories of child competency and step difficulty were defined. The probability of collaborating was then computed from our logistic GEE model consisting of step difficulty and competency. Standard error bars are displayed.

Figures 1a and 1b, that is, the observed and computed probabilities of children collaborating on a given step, are remarkably similar. The congruence of the cell values and direction of change augment the logistical regression analyses by providing a direct demonstration that children's behavior was consistent with our predictions. Most importantly, this analysis suggests a large portion of children's decisions to collaborate may be a function of two factors: children's competency and the difficulty of the activity.

Levels of Collaboration. We also investigated whether the character, or magnitude, of the collaborative interactions differed as a matter of step difficulty and children's competency. We performed a multinomial distribution GEE in which the dependent variable was the level of collaboration, with no collaboration being level 0. The specific toy (Sally = 0, Sally's House = 1) and children's gender (female = 0, male = 1) were the factors. The three predictors were step difficulty, children's competency, and age. The resulting analysis indicated that the log of the odds of raising the level of children's collaboration was significantly positively related to step difficulty (p = .000) and significantly negatively related to children's competency (p = .000; Table 2). This indicates that the collaborative interactions tended to involve more action and information sharing from the adult collaborator as the difficulty of the steps rose and children's Competency Scores decreased. Neither age nor any of the factors related to the character of children's collaboration. This model furthers our understanding by suggesting that not simply the occurrence of collaboration, but also the character of the collaborative interactions relate to the difficulty of the activity and children's ability to independently execute the activity.

Table 2: Cumulative Logistic Regression Analysis of Children's Level of Collaboration

Predictor	**β**	***SE* β**	**Wald's χ2**	***P***	**OR**
Constant (Level = 0)	-2.76	2.28	1.47	.23	.06
Constant (Level = 1)	-2.28	2.28	1.0	.32	.10
Constant (Level = 2)	-1.86	2.30	.66	.42	.16
Constant (Level = 3)	-.79	2.27	.12	.73	.46
Toy	-.15	.39	.15	.70	.86
Gender	-.06	.66	.01	.92	.94
Step Difficulty	.94	.15	37.04	.00***	2.56
Competen-cy	-.11	.02	45.81	.00***	.90
Age	-.41	.49	.72	.40	.66

Table 2: Table 2 shows the results of the parameter estimates for a cumulative logistic regression analysis performed with a General Estimating Equation. The model assesses which variables are predictive of the character of children's collaboration. Toy (Sally = 0, Sally's House = 1) and gender (female = 0, male = 1) were entered as factors. Step difficulty, competency, and age were entered as covariates. The levels of collaboration, described above, refer to different categories and magnitudes of collaborative interactions. Degrees of freedom = 1.
**** Indicates statistically significant at the .001 level.*

Again, it was possible that children involved the collaborator more because of fatigue of the activity as opposed to step difficulty. We therefore performed another analysis to evaluate whether differences in the character of children's collaboration resulted from the order of the steps as opposed to step difficulty. The regression indicated that step difficulty, not the order of steps, related to the character of children's collaboration (Step difficulty: β = .744, Wald's χ2 = 20.989, p = .000; Step: β = .015, Wald's χ2 = .228, p = .633). This provided further evidence that the difficulty of the activity, as opposed to some other aspect inherent in the order of steps, related to the manner in which children collaborated.

Discussion

The results show that the probability of a child requesting collaborative assistance on a given step was predicted both by the child's initial competency in constructing similar toys and the difficulty of constructing the same toys without adult assistance. Indeed, a statistical model consisting of those two predictors alone provided a comparable match to children's observed probability of collaborating (Figures 1a and 1b). Second, the character of children's collaborative interactions, that is, the extent to which children were involved, was predicted by children's competency and step difficulty. This indicates that these two factors are not only related to the occurrence, but also to the substance of collaborative interactions**.**

These results support an "information gathering" perspective of children's collaboration related to their help-seeking. This can be best appreciated by understanding the link between the difficulty of the activity and the information to be gained by independent versus collaborative behavior. Indeed, children are implicitly motivated to seek more information through active search when evidence is ambiguous or complex (Schulz & Bonawitz, 2007). Initiating collaboration may have a similar motivation. Indeed, seeking collaborative assistance may be the optimal strategy in circumstances in which independent exploration is not providing the necessary information to overcome difficulty.

Of course, this by no means precludes the importance of other factors, such as a species-wide pro-social disposition (Tomasello et al, 2005). Indeed, it is certain that other factors contribute to young children's collaboration. However, our results suggest that, in the motivation to accomplish a goal (complete a task, learn a new skill, etc.), aspects of the environment – including the type of goal or task, the competency, skill or knowledge of any individual child – may serve as powerful influences on whether collaboration is initiated, if at all. Future work is needed to examine how the various "proximate causes" of collaboration interact in children's everyday behavior and in different contexts, such as peer collaboration.

Our results also suggest a way in which social learning and learning through exploratory play may be fully integrated. That is, children are neither "stubborn autodidacts" (Harris, 2002) when they learn nor are they passive recipients of social information. Rather, through their own activity, children trade between exploring by themselves and exploiting the knowledge of others. By addressing both the nature and the immediate causes of collaborative vs. non-collaborative behavior, future work may shed light on the many ways in which they relate, and how collaboration contributes to children's impressive early learning abilities.

Acknowledgments

We thank Yue Yu, Felix Thoemmes, and Francoise Vermelyan for their helpful feedback.

References

Berry (1991). The role of action in implicit learning. *The Quarterly Journal of Experimental Psychology A: Human Experimental Psychology*, 43A(4), 881-906. doi:10.1080/14640749108400961

Duran, R. T., & Gauvain, M. (1993). The role of age versus expertise in peer collaboration during joint planning. *Journal Of Experimental Child Psychology*, 55(2), 227-242. doi:10.1006/jecp.1993.1013

Foley, M., Ratner, H., & House, A. (2002). Anticipation and source-monitoring errors: Children's memory for collaborative activities. *Journal Of Cognition And Development*, 3(4), 385-414.

Harris, P. L. (2002). What do children learn from testimony? In P. Carruthers, M. Siegal, & S. Stich. (Eds.), *Cognitive bases of science*. Cambridge: Cambridge University Press. doi:10.1017/CBO9780511613517.018

Koenig, M. A., & Harris, P. L. (2005). The role of social cognition in early trust. Trends In Cognitive Sciences, 9(10), 457-459.

Kushnir, T., Wellman, H. M., & Gelman, S. A. (2009). A self-agency bias in preschoolers' causal inferences. *Developmental Psychology*, 45(2), 597-603.

Nelson-le Gall, S. A. (1987). Necessary and unnecessary help-seeking in children. *The Journal Of Genetic Psychology: Research And Theory On Human Development*, 148(1), 53-62. doi:10.1080/00221325.1987.9914536

Nelson-Le Gall, S., Kratzer, L., Jones, E., & DeCooke, P. (1990). Children's self-assessment of performance and task-related help seeking. *Journal Of Experimental Child Psychology*, 49(2), 245-263. doi:10.1016/0022-0965(90)90057-F

Paradise, R., & Rogoff, B. (2009). Side by side: Learning by observing and pitching in. *Ethos*, 37(1), 102-138. doi:10.1111/j.1548-1352.2009.01033.x

Schulz, L. E., & Bonawitz, E. (2007). Serious fun: Preschoolers engage in more exploratory play when evidence is confounded. *Developmental Psychology*, 43(4), 1045-1050. doi:10.1037/0012-1649.43.4.1045

Sommerville, J. A., & Hammond, A. J. (2007). Treating another's actions as one's own: Children's memory of and learning from joint activity. *Developmental Psychology*, 43(4), 1003-1018.

Sommerville, J. A., Hildebrand, E. A., & Crane, C. C. (2008). Experience matters: The impact of doing versus watching on infants' subsequent perception of tool-use events. *Developmental Psychology*, 44(5), 1249-1256. doi:10.1037/a0012296

Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (2005). Understanding and sharing intentions: The origins of cultural cognition. *Behavioral and Brain Sciences*, 28(5), 675-735. doi:10.1017/S0140525X05000129

Warneken, F., Gräfenhain, M., & Tomasello, M. (2012). Collaborative partner or social tool? New evidence for young children's understanding of joint intentions in collaborative activities. *Developmental Science*, 15(1), 54-61. doi:10.1111/j.1467-7687.2011.01107.x