

The Effects of Older Siblings on Motor Skills for Infants and Young Children

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Older siblings have a great deal of influence on their younger siblings. In many cases, they assist their brothers and sisters in all aspects of motor development. The outcomes of younger siblings' motor skill development, when interacting with older siblings in locomotor and object control activities, are key to promoting movement patterns. In addition, research found that older siblings have positive effects on their younger siblings, helping them reach proficiency in motor skills. However, other studies have shown that the influence of older siblings is not always beneficial. Therefore, the purpose of this paper was to review the effects of older siblings on motor skills including fundamental motor skills (FMS) of their younger siblings and to highlight the positive and negative aspects of older siblings' influence on infants and young children. The findings of this paper suggest that age, imitation, and siblings of the same gender are positive aspects of siblings' motor skill development. In addition, negative effects of siblings, such as fighting and arguing, were found. This paper can provide a better understanding of how to approach different methods of raising infants and young children to maximize the development of their motor skills including FMS.

Key words: fundamental motor skills, motor development, motor skills, siblings, infancy, early childhood

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Introduction

Motor development is an important aspect of human life, especially in the early stages of infancy and childhood (Payne & Isaacs, 2020). The transformations and developments that take place throughout humans' lives are studied in great detail. Studying motor development is important to learn how internal and external factors influence and shape our growth and progression through life. These factors can be particularly significant in the beginning stages of life when people undergo a great deal of change. Infancy and early childhood has been described as an essential period in life where young individuals can gain movement proficiency (Goodway et al., 2020) and rapidly learn and acquire a wide set of motor skills that can help improve overall motor development (Kwon & O'Neill, 2020).

Fundamental motor skills (FMS) are basic movement skills that serve as a prerequisite to help children and young children become independent movers in their environments (Chang et al., 2021). FMS can be classified as locomotor and object control skills and are considered essential building blocks for more context-specific skills in sports (Goodway et al. 2020). Locomotor skills are defined as the skills used by an individual to move from one place to another, either horizontally or vertically, between two places. Object control skills, on the other hand, are referred to as proficiencies in catching, striking, and throwing movements (Gentry & So, 2019; Goodway et al., 2020). Both of these types of skills can be performed with the abilities of one's gross motor skills, which involve major muscle groups that contribute to actions such as walking or balancing (Payne & Isaacs, 2020).

Leonard and Hill (2016) mentioned that our interactions with other people revolve around our motor skills. Building up the motor skills we attain early on in life improves the way we can navigate our surroundings, which in turn can help us socialize with other individuals (Kim & Shin, 2021). These skills also allow us to track milestones that are reached throughout the development of infants. Progression in the abilities involved in motor skills can lead to crawling, walking, grasping objects, and other major development points during this stage of life (Payne & Isaacs, 2020). It is especially important to train the skills necessary for these milestones in early childhood because they usually occur before the infant reaches 18 months of age (Berger & Nuzzo, 2008). Improving motor skills also allows for the infant to increase its capability in varying postures, movements, and object manipulation (Rebelo, et al., 2020). Becoming accustomed to different postures gives the infant the ability to sit up and stand up without support, which opens the door for them to move around more easily and see more of the world around them (Payne & Isaacs, 2020). An infant with developed motor skills can put itself in a position to see an item and handle it in whichever way it sees fit. Having these experiences prepares the infant to move on to the next stage in life where further interaction takes place.

The development of FMS involves influence from a variety of elements such as individuals' motor

abilities, socioeconomic status (SES) or location. Valdívía et al. (2019) mentioned the impact that both biological and environmental features have on gross motor coordination, a more specific portion of motor skills. Though it is certain that there are avenues internally and externally through which our development can be shaped, Valdívía et al. (2019) stated that it is currently unclear how much effect each factor (e.g. environmental, biological or individual factor) has. Nonetheless, it has been noted that some of the major influencers of the motor skills for infants and young children are their siblings. According to Berger and Nuzzo (2008), children who have siblings and are preschool-aged or younger spend the most amount of time with their siblings, even more so than with their parents. The younger siblings in this relationship are said to benefit immensely in their development (Berger & Nuzzo, 2008). Older siblings who have completed the motor skills learned through early childhood can guide their younger siblings by providing them with instruction of these skills (Berger & Nuzzo, 2008). They can recall the experience they have with these actions and teach the infants and young children of their family to assist them with their development.

One of the most impactful methods by which infants can begin to learn and develop their motor skills is through imitation. Throughout the first few years of life, infants are increasingly able to sustain focus on certain objects or people (Aldrich et al., 2015). Directing this focus into specific actions can help them create those actions on their own. It has been noted that younger children can imitate their older siblings' movements four times more often than the older siblings do them (Venetsanou & Kambas, 2010). In this case, they are able to accomplish movements that are new to them with minimal instruction. Barr and Hayne (2003) stated that observing and copying the movements of other people can lead to the acquisition of new skills and behaviors. Being able to watch their siblings and imitate their motions and behaviors may help infants gain an advantage in having more opportunities to learn new skills.

Previous studies highlighted the positive effects that older siblings have on infants and young children (Barr & Hayne, 2003; Brody, 2004; Kwon & O'Neill, 2020; Rebelo et al., 2020; Reid et al., 2010; Venetsanou & Kambas, 2010). However, there were studies that found a negative relationship between infants' FMS and older siblings. As Berger and Nuzzo (2020) stated in their work, infants and young children see both advantages and disadvantages in having older siblings. Previous studies have shown that older siblings can, in fact, have negative impacts on motor skill development in infants of 18 months (Cruise & O'Reilly, 2014). Leonard and Hill (2016) also found that the results of the study did not support the notion that older siblings are good teachers of motor skills. In some cases, the effect that older siblings have on FMS of infants can be negligible.

There were studies exploring the effects of siblings on the cognitive and social development of infants and young children (Brody, 2004; Rebelo et al., 2020). Though these areas of study are very

important, it is also prudent to focus on FMS of young individuals and how they can develop with environmental factors. Despite the benefits of having older siblings that are often brought to light, it is crucial to see the big picture and also shed light on the disadvantages. Therefore, the purpose of this paper was to review the positive and negative effects that older siblings have on the development of motor skills including FMS in infants and young children.

Positive Effects of Siblings

Age

Brody (2004) found that older siblings can begin to teach concepts of motor skills once they reach middle childhood. At this time, they have a better understanding of what is necessary for given actions and are able to share their experiences with their younger siblings (Brody, 2004). As they reach middle childhood and grow older, they develop the ability to instruct and explain tasks more efficiently, making it easier for infants and young children to grasp new concepts in movement. Furthermore, Kwon and O'Neill (2020) explored the effects of familial characteristics, such as age difference of siblings on FMS. Kwon and O'Neill (2020) measured the gross motor skills of 329 children between 3-5 years of age. The scores of motor skill proficiency differed based on the ages of the children they lived with. Young children residing with other young children, aged 5 years or younger, showed higher scores in locomotor skills. However, older children aged between 6-17 years acquired higher scores in object control skills. This may suggest that older siblings can provide younger siblings with instruction in object control skills, thus helping them develop these skills a younger age.

Imitation

Berger and Nuzzo (2008) found that young children tend to engage in imitation in order to perform new tasks, and infants can learn certain motions that older siblings complete and perform tasks without being directly instructed Berger and Nuzzo (2008) also noted that younger siblings tended to walk or crawl significantly earlier than the point at which their older siblings began to show similar movements. It can be possible that the imitation of those older siblings walking around them helped infants in completing those motor skills at earlier ages.

In copying older siblings, infants are able to learn actions that improve their motor skills. Barr and Hayne (2003) observed records of 300 infants and analyzed how imitation played a role in their development of motor skills. Parents kept diaries of the imitation that their infant children, 12-18-month olds, exhibited over a week. Half of the infants had older siblings, whereas the other half consisted

of only children. The infants with older siblings were able to learn one to two new behaviors each day (Barr & Hayne, 2003). These findings show the behaviors ascertained without instruction; the infants learned these tasks through imitation. This is aligned with the increased learning opportunities that come with having older siblings (Leonard & Hill, 2006).

Gender

Rebelo et al. (2020) conducted research with 405 children between the ages of 12 and 48 months to explore the relationship between having siblings and motor skills. About half of the children (199) had siblings. The Peabody Developmental Motor Scales-Second Edition (PDMS-2) was used to assess motor skills, and the scores showed that the children having siblings had higher scores across all motor skills compared to the children without siblings. They found that the presence of siblings contributes to improving the motor skills of young children. When older siblings play with younger siblings, it challenges them to perform actions that they may not be familiar with, leading to proficiency in fundamental motor skills at earlier ages than children without siblings (Rebelo et al., 2020). Valdívía et al. (2019) also conducted research to investigate sibling resemblance in gross motor coordination (GMC), biological and environmental correlates of GMC. Körperkoordinationstest für Kinder (KTK) test was used to evaluate GMC. The results showed that sister-sister pairs finished with more similarity in scores in GMC than brother-brother and brother-sister pairs, but brother-brother pairs ended up with the highest scores (Valdívía et al., 2019). These results can reveal that siblings of the same gender may have a higher likelihood of succeeding together. In addition, older siblings were found to have higher motor coordination scores than younger siblings, supporting the evidence that older siblings are adept to teaching younger siblings their abilities and tactics in FMS (Valdívía et al., 2019).

Most of the findings from previous studies reported direct contributions from older siblings. These children and adolescents provided instruction or performed actions for their younger siblings to imitate. According to Brody (2004), there was also an indirect contribution found in these familial factors in infant motor skill development. As parents raise their first child, they realize which strategies seemed to be effective and which strategies should be avoided for subsequent children (Brody, 2004). After gathering these strategies, parents are able to utilize them to shape new and possibly improved methods of raising their next child. In these cases, older siblings are used as models for the parents to learn which old and new approaches are effective in raising children (Brody, 2004). This allows parents to formulate the expectations they have for their next child's development, leading the younger siblings to have better motor skills.

Negative Effects of Siblings

It has been found that children can have positive effects on their siblings' motor skills, but the effects may not be as great if they are the same age. According to Aldrich et al. (2015), when pairs of young twins were placed in a room with toys, many of them played separately with their respective toys and were not engaged with their siblings. In some cases, the twins would watch each other playing with their toys but would not act upon that observation. Interaction would only begin when their mother would come in to play with them. With this older figure in their life, they were more engaged and interacted with toys more often (Aldrich et al., 2015). This result is aligned with the notion that the benefits of having siblings may not be notable unless they are older.

Younger siblings model older siblings for many things in life. Early on, they look to them to help them build their motor skills and FMS. However, if the older sibling's motor skills are not at the level of proficiency, they may not be the best of models to imitate. Leonard and Hill (2016) mentioned that when compared with only children, infants who had older siblings were found to have lower performances of gross motor skills. This is not consistent with findings from previous studies suggesting older siblings are good models for teaching FMS. Perceived agonism was also the potential factor (Leonard & Hill, 2016). This encompasses much of the unfavorable interactions that occur between siblings, such as fighting and arguing. These can act as reciprocal effects to the motor development of younger siblings and lead to negative trends in motor skill advancement. When younger siblings feel antagonized by their older siblings, they may not be inspired to practice their motor skills (Leonard & Hill, 2016). This can lead to poor performance in motor skills and FMS. Reid et al. (2010) investigated the relationship between having an older sibling and early goal-directed motor development. Seventy-two infants at 5 months of age were observed playing with their mothers. When infants grew to 12 months, they were brought back and repeated the assessment. The infants were led to complete goal-directed actions involving toys in both instances. Infants with siblings completed more goal-directed actions, but only once they reached 12 months of age. At 5 months, it was found that infants without siblings were able to produce more of these actions. This shows that the benefits of having siblings may be delayed, resulting in the accomplishment of certain activities later than their only-child counterparts (Reid et al., 2010). Cruise and O'Reilly (2014) observed the social environments surrounding infants, including their siblings, to examine the effects they have on developmental outcomes. The caregivers of more than 10,000 infants aged nine months old completed questionnaires and provided information regarding the infants' environments. Cruise and O'Reilly (2014) found that having siblings predicted the infants' failure to reach gross motor milestones in infancy and early childhood. In addition, as the number of siblings of a given infant increased, the likelihood of failing to reach those motor milestones also increased. The results of this study

demonstrate how more siblings can hinder the development of younger siblings.

Discussion

This paper reviewed the effects of older siblings on motor skills of younger siblings in infancy and early childhood. The results of cognitive aspects of development were mentioned by studies (Brody, 2004; Cruise & O'Reilly, 2014; Rebelo et al., 2020), but only the findings pertaining to the motor domain of child development were reported in this review. Additionally, researchers discussed the effects of younger siblings on older siblings' development, but those results were excluded from this paper (Reid et al., 2010). Many studies found that older siblings have positive effects on motor or movement skills of infants and young children. Multiple studies reported higher scores of motor skills for infants and young children with older siblings, suggesting that older siblings are good for motor development (Barr & Hayne, 2003; Kwon & O'Neill, 2020; Rebelo et al., 2020). However, this was not always the case when studying infants and young children. Some studies were able to highlight negative findings in similar study layouts (Cruise & O'Reilly, 2014; Leonard & Hill, 2016). This contradicts the positive findings mentioned by the previous studies (Barr & Hayne, 2003; Kwon & O'Neill, 2020; Rebelo et al., 2020), begging the consideration of rethinking the strength behind the theory of older siblings' positive effects on younger siblings' motor skills. The results found by Cruise and O'Reilly (2014) may be due to a concept known as resource dilution. As parents have more children, they are not able to spend quality time with each child individually, meaning the younger children spend more time with their older siblings. Likewise, it is difficult for siblings to focus on each other exclusively. This leads to the result that older siblings, whose parents lean on to raise the younger children, are not able to effectively teach each one the motor skills they need to develop correctly. Although having a greater amount of older siblings gives younger siblings more avenues of learning, they may not be able to receive the instruction they need. There were studies suggesting a delayed effect on younger siblings (Rebelo et al., 2020; Reid et al., 2010). Reid et al. (2010) found that infants with older siblings did not score higher than infants without siblings until 12 months of age. Rebelo et al. (2020) also found similar delays that implied benefits from older siblings might not be notable until the younger sibling is 24 months of age. It is not clear whether this suggests that only children are more advanced in their motor skills early on or that children with older siblings are at a disadvantage. Further research may need to focus on the onset of positive effects of older siblings to provide more conclusive support for this idea of advantage or disadvantage.

Conclusion

Older siblings are a significant factor to assist their brothers and sisters in motor development. They

help their brothers and sister promote motor and movement skills such as locomotor and objective skills when they are interacting or playing together. It would be the key to develop future movement patterns. This paper found positive elements of siblings' motor skill development such as age, imitation, and siblings of the same gender. However, some negative aspects of older siblings in younger siblings' development of motor skills were also found. It is clear that more research is necessary to produce more concrete notions of how to evaluate the topic of older siblings' effects on the motor skills and FMS of younger siblings. It also can be useful to find which activities are more effective when teaching infants and young children motor skills and FMS. Based on the findings of this paper, it may be overzealous to claim that older siblings are strictly beneficial or hindering to early childhood motor development. However, it is evident that there are both advantages and disadvantages to having older siblings, and this must be taken into consideration when raising young children.

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