PARENTS AND CHILDREN'S PERCEPTIONS OF THEIR GROSS MOTOR ABILITIES AND PHYSICAL ACTIVITY LEVELS

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Abstract

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As children move through adolescence their level of physical activity declines. Researchers have demonstrated that physically inactive children perform worse in school and are more likely to be inactive in the future while also increasing their risk for future health problems as adults. The purpose of this study was to determine if parent perceptions of their child's gross motor skill abilities were similar to their child's enjoyment of performing (GMS). The primary author hypothesized that parents' perceptions would impact their child's enjoyment to perform GMS and that parents who believed their child demonstrated high levels of gross motor competence would have a child that enjoyed performing those gross motor skills. A total of 50 participants participated in this study. Results from this study indicated that a parent who perceives their student performing GMS at a high level, also had a student who enjoyed performing GMS. These results demonstrate the importance of how parents perceive their student's abilities which may be a prime indicator of physical activity levels for children.

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Introduction

The Center for Disease Control and Prevention (CDC, 2020) recommends children ages 6 to17 receive at a minimum 60 minutes a day of moderate-to-vigorous physical activity (MVPA). Children can achieve 60 minutes of MVPA during their school day by participating in recess, intramural sports, and by attending before and after school day programs. Time spent being physically active should be enjoyable and developmentally age appropriate for children (Strong et al., 2005). As children move through adolescence their level of physical activity declines with only 42% of children ages 6 to11 years obtaining the recommended amount of daily physical activity (Bradley et al., 2008). Research has also shown that physically inactive children miss school, perform worse academically, and are at higher risk for obesity as they become adults (Moore et al., 1991). By identifying key factors (e.g., preferred activities) that promote physical activity, educators can use this information to improve the physical activity options for children and adolescents (Barnett, 2008).

Physical activity can be defined by the body's ability to perform gross motor skills (GMS; Clark & Metcalfe, 2002). GMS consist of locomotor and object control skills. Locomotor skills are body movements through space and include running, galloping, skipping, hopping, sliding, and leaping (Haywood & Getchell, 2005). Object control skills are an individual's ability to manipulate or project an object and include throwing, catching, bouncing, kicking, striking, and rolling (Haywood & Getchell, 2005). The development of these GMS has been identified as the underlying element for promoting life-long engagement in physical activity (Stodden, 2008). Conversely, children and

adolescents who do not achieve proficiency in Fundamental Motor Skills (FMS) will have limited opportunities for physical engagement later on in life due to a lack of prerequisite skills (Stodden, 2008). Additionally, researchers have demonstrated children who have more proficient motor skills are more physically active as early as preschool (Strong, 2005). A child with proficient motor skills can establish physical literacy, which gives them the ability, confidence, and desire to be physically active for life (Higgs, et al. 2008).

Researchers have reported a lack of proficient GMS decreases self-perception in children leading to lower levels of physical activity in adolescents. (Barnett et al., 2008). Therefore, developing GMS is essential as children transition to adolescents, reports have demonstrated this time period is when children with actual lower motor competence begin to become less physically active (Goodway & Rudisill, 1997). Stodden (2008) suggests a lower self-perception is the cause of a "negative spiral of disengagement," resulting in an increased risk of obesity.

Children's perception of self has a significant impact on their actual motor competencies and skill proficiency (Liblik & Raudsepp, 2002). Researchers have suggested that children with higher self-perceptions of their GMS ability will have an increase in motivation to participate in fitness and physical activity (Harter, 1999). Prior to adolescents' children tend to have a higher perceived competence than their actual ability to perform a gross motor skill (Harter & Pike, 1984). Reasons for higher self-perception can be related to a child's developmental level as younger children tend to think of effort as mastery and do not compare themselves to others at this age. Children

do not differentiate between competency and what is reality until they reach adolescents (Harter, 1999; Stodden et al., 2008). However, attitude towards performing a GMS can be attributed to their competence to perform the skill, meaning a child is more likely to enjoy performing skills they do well then skills they do not (Welk, 1999).

Children's perceptions of themselves are often heavily influenced by their parent's perception of them (Welk, 1999). Parents can influence their child's environment by being physically active role models and by encouraging their children to participate in sports, and providing more opportunities to engage in activity (Horn, 2004). Results from a study by O'Neill (2013) demonstrated that parents who perceived their children to have higher movement competence actually did when compared to parent's perceptions of their children with lower movement competence, suggesting parents may have an accurate perception of their child's gross motor ability. Welks (1999) stated in his research the most common determinants of a child's inclination to remain physically active was from their perceived competence of self, enjoyment performing the gross motor skill and parental influence. By understanding how parent's perceptions can influence children's physically active levels, schools and teachers can develop settings that promote MVPA and help decrease the risk of childhood obesity (O'Neill, 2013).

Understanding what factors hinder a child's motivation to remain physically active into adolescents will support future teaching curriculums, parent's knowledge, and ultimately decrease the likelihood for obesity in youth. Therefore, the purposes of this study were to determine if a parent's perception of their child's gross motor abilities were reflective of the child's enjoyment of gross motor skills performance, and to determine if

parent perception and time spent being physically active with their child influenced their child's enjoyment of a GMS. The researchers hypothesized that parents' perceptions would have a significant similarity to their child's actual ability to perform GMS and that parents who believed their child demonstrates high levels of gross motor competence would have a child that enjoyed performing that gross motor skill. Second, researchers hypothesized parents who spent time being physically active with their children would have children that enjoyed being physically active.

Methods

Participants

Participants for this study included a total of 22 students and 28 parents. Student's ages ranged from 4 to 13 years and were from the following grade levels; kindergarten, 1st, 5th and 7th. Of the students there were 12 males and 9 females and 1 student identified as gender non-binary. Twenty-four parents identified their child as "white (of European descent)" the remaining four identified them as Asian, African American, multi-racial and Latino. Participants attended a kindergarten through 8th grade public charter school in Northern California. Students commuted to the school from all over the county and come from middle class and affluent family backgrounds. The school was guided by Waldorf Education principles, which emphasize natural developmental rhythms to enrich imagination, creativity, academic excellence, and social responsibility in students. Within this program, each participant attends a developmental movement class focused on improving their locomotor skills. Participants receive instruction by their developmental movement teacher who has over thirty years of teaching experience in the state of California and possesses a Waldorf Education teaching credential. During the study the class took place for thirty minutes to an hour a day, virtually over Zoom. Due to the COVID-19 pandemic participants did not receive in-person instruction during this time, instead an alternative distance learning model for virtual instruction was in place.

Data Collection

The intervention procedure used for data collection was to determine if a parent's perception of their child's gross motor abilities were equal to the child's enjoyment of gross motor skills performed, and to determine if parent perception and time spent being physically active with their child influenced their child's enjoyment of a GMS. Prior to collecting data, the first author obtained consent from the Institutional Review Board (IRB) for the Protection of Human Subjects on October 23, 2021. The IRB number for the first author research was 20-017.

A survey was sent three times over a 3-week time span to parents and students emails by the student's Developmental Movement Teacher. A total of 98 parents and 98 students were emailed the survey. Of the total 196 participants, data from 22 students and 28 parents was collected. A link to the survey was provided to parents and their children using Google Forms. Parents and students gave consent to participate in the study by clicking the "next" button at the beginning of the survey. To track data, parents and students were asked to create an ID to keep their information private. The parent survey asked them to provide their child's ID, so the child of a parent could be identified.

Survey

This survey was designed around two sections. *Section 1* focused student's enjoyment of GMS. Students were given a pictorial scale to depict their level of enjoyment for a locomotor skill. The student survey included 18 questions with pictorial responses and three multiple choice questions. Facial images were downloaded using Google Docs Special Characters. The three pictures in the student's survey included a

face for “I do not enjoy,” “I really enjoy” and “neutral.” A student would select “I do not enjoy” if they dislike performing that GMS. GMS they “enjoy” would be skills they are excited about and like to perform regularly. “Neutral” was for students to select if they had no preference as to whether they enjoyed or did not enjoy a skill. Examples of locomotor skills included running, hopping, sliding, skipping, jumping, galloping and leaping. Examples of manipulative skills included catching, throwing, striking, dribbling and kicking a ball (Haywood & Getchell, 2005) and were used in the survey because they are the gross motor skills students within this age range will have started to acquire or master by this time (Clark & Metcalfe, 2002). The final four questions asked student participants what skills they felt most confident doing, how much they enjoyed being physically active, and how often they participated with their parents in physical activity. The first two questions, students responded by selecting all answers that applied to them of the locomotor and manipulative skills. The third question had the same response options as the first 15 questions, students could respond with “I really enjoy,” “I do not enjoy” or “neutral” as a response. The fourth question was multiple choice, with responses that included; 0-1, 2-3, 3-4 or 5 or more days.

Section 2, the parent’s survey included 18 Likert scale and three multiple choice responses. For example, “How well do you believe your child currently performs the locomotor skill running?” Answer responses included; unable to rate, poorly, fair, good and very well. Multiple choice questions asked parents to select the locomotor and manipulative skills they felt most comfortable participating in with their child and how many days a week they were physically active with their child. An answer key was

provided with definitions for each response. Key terms were also provided at the beginning of the survey for gross motor, locomotor and manipulative skills and physical activity. Prior to beginning the survey parent participants were provided a key with website links to view visuals of locomotor and manipulative skills described in the survey. They also answered demographic questions regarding their child including their gender, age, grade level, ethnicity and number of years their child has attended the Developmental Movement Class.

Results

Demographics

A total of 50 participants (i.e., 28 parents, 22 students) participated in this study. Of the 28 parents, 53.6% were male, 42.9% were female, 3.6% identified as gender non-binary. A large majority (i.e., 85.7%) identified as White (of European dissent), and the following four (3.6%) demographics identified as Latino, Asian, and African American and Multi-Racial. Student participant's ages ranged from 4 to 13 years with 12-year-olds accounting for the highest percentage (i.e., 35.7%) of participants. Additionally, the highest percentage (i.e., 32.1%) of student participants had 3 years or more experience in the developmental movement class (Table 1).

Tables

Table 1

Student Participant Demographics

S	Gender		Ages		Grade		Ethnicity		Years in Developmental Class	
9	Female	42.9%	4	3.6%	K	14.3%	White	85.7%	0	17.9%
			5	14.3%						
12	Male	53.6%	6	17.9%	1st	32.1%	Latinx, Hispanic		1	28.6%
			7	14.3%			or Spanish	3.6%		
		3.6%	10	7.1%	5th	14.3%				

S	Gender	Ages		Grade		Ethnicity		Years in Developmental Class	
1	Gender non-binary	11	3.6%			Black or African American	3.6%	2	21.4%
		12	35.7%	7th	39.3%				
		13	3.6%			Multi-racial	3.6%	3 or more	32.1%

The Likert Scale was used for parent's response to their child's locomotor and manipulative skills. Of the locomotor skills, running had the highest percent (64.3%) of parents reporting their child performed "very well." Galloping received the lowest percent (32.1%) for "very well" of children's performance. Very few parents rated their child performing any of the locomotor skills as "poorly," with 3.6% being the highest percent in 4 out of 7 of the locomotor skills. The locomotor skill slide had the highest rating for "fair" (17.9%) and skipping had the highest rating for "unable to rate" (7.1%). The most enjoyable locomotor skill from the student survey was the slide (81.8%). The highest percent for a locomotor skill student's do not enjoy was the gallop (18.2%), it also had the highest percent of "neutral" (50%) responses (Table 2).

Table 2

Parent Perceptions of their Child's Locomotor Skills and Students Enjoyment in Engaging in Locomotor Skills

Parent Question	Parent Response %	Student Question	Student Response %
1. How well do you believe your child performs the locomotor skill running?	VW 64.3 G 28.6 F 3.6 P 3.6 UR	1. How much do you enjoy running?	E 63.6 DE 4.5 N 31.8
2. How well do you believe your child currently performs the locomotor skill jumping?	VW 60.7 G 17.9 F 14.3 P 3.6 UR 3.6	2. How much do you enjoy jumping?	E 59.1 DE 9.1 N 31.8
3. How well do you believe your child currently performs the locomotor skill skipping?	VW 35.7 G 39.3 F 17.9 P	3. How much do you enjoy skipping?	E 54.5 DE 4.5 N 40.9

Parent Question	Parent Response %	Student Question	Student Response %
	UR 7.1		
4. How well do you believe your child currently performs the locomotor skill hopping?	VW 46.4 G 46.4 F P 3.6 UR 3.6	4. How much do you enjoy hopping?	E 40.9 DE 13.6 N 45.4
5. How well do you believe your child currently performs the locomotor skill galloping?	VW 32.1 G 53.6 F P UR 14.3	5. How much do you enjoy galloping?	E 31.8 DE 18.2 N 50
6. How well do you believe your child currently performs the locomotor skill leap?	VW 46.4 G 39.3 F 10.7	6. How much do you enjoy leaping?	E 59.1 DE N 40.9

Parent Question	Parent Response %	Student Question	Student Response %
	P UR 3.6		
7. How well do you believe your child currently performs the locomotor skill slide?	VW 53.6 G 25 F 17.9 P 3.6 UR	7. How much do you enjoy sliding?	E 81.8 DE 9.1 N 9

Note. VW=very well, G=good, F=fair, P=poor, UR=unable to rate, E=really enjoy, DE=does not enjoy, N=neutral

The next section of the parent survey asked about their child's ability to perform manipulative skills. The major results in this section were kicking a ball, having the highest percent (46.4%) of parents reporting their child performed the skill "good." Overhand throw had the second highest percent (42.9%) of students performing "good." Performance for "good" had a higher percent on all manipulative skills than "very well." The skill catching had the highest percent (17.9%) of parents reporting their child performed "poorly." A majority (28.6%) of parents responded with "fair" for their child performing the dribble. Overall, the distribution of performance levels for manipulative skills varied more than locomotor skills. The child survey had similar results. The manipulative skill kicking a ball (90.9%) was the highest response for enjoyment. The highest responses for skills not enjoyed were underhand throw (13.6%), single hand strike (13.6%) and two hand strike (13.6%). The highest response for neutral was for dribbling (50%) (Table 3).

Table 3

Parent Perceptions of their Students Manipulative Skills and Students Enjoyment in Engaging in Manipulative Skills

Parent Question	Parent Response %	Student Question	Student Response %
1. How well do you believe your child currently performs the manipulative skill catching?	VW 25 G 28.6 F 28.6 P 17.9 UR	1. How much do you enjoy catching?	E 68.2 DE 4.5 N 27.3
2. How well do you believe your child currently performs the manipulative skill dribbling?	VW 17.9 G 25 F 28.6 P 7.1 UR 21.4	2. How much do you enjoy dribbling?	E 40.9 DE 9.1 N 50

Parent Question	Parent Response %	Student Question	Student Response %
3. How well do you believe your child currently performs the manipulative skill overhand throw?	VW 35.7 G 42.9 F 10.7 P 10.7 UR	3. How much do you enjoy throwing a ball overhand?	E 72.7 DE 4.5 N 22.7
4. How well do you believe your child currently performs the manipulative skill underhand throw?	VW 28.6 G 39.3 F 28.6 P 3.6 UR	4. How much do you enjoy throwing a ball underhand?	E 50 DE 13.6 N 36.3
5. How well do you believe your child currently performs the manipulative skill single strike?	VW 25 G 32.1 F 21.4 P 10.7 UR 10.7	5. How much do you enjoy striking a ball with a single hand?	E 50 DE 13.6 N 36.4

Parent Question	Parent Response %	Student Question	Student Response %
6. How well do you believe your child currently performs the manipulative skill two-hand strike?	VW 21.4 G 32.1 F 21.4 P 3.6 UR 21.	6. How much do you enjoy striking a ball with two hands?	E 50 DE 13.6 N 36.3
7. How well do you believe your child currently performs the manipulative skill kicking?	VW 35.7 G 46.4 F 14.3 P 3.6	7. How much do you enjoy kicking a ball?	E 90.9 DE N 9.1

Note. VW=very well, G=good, F=fair, P=poor, UR=unable to rate, E=really enjoy, DE=does not enjoy, N=neutral

There were two questions at the end of the survey that related to day-to-day physical activity. The first one asked the parents how they felt their child's level of physical activity was day-to-day, 50% said it was "very well" and only 7.1% said it was "poor." The next question asked how they felt their own current physical activity levels were with their child day-to-day, 7.1% said it was "very well." Percentages were higher for "poor" and "fair" at 32.1% (Table 4).

The following questions asked parents how their child performed in individual and team sports. For individual sports like swimming or biking, the highest percent was 53.6% of parents reporting their child performed these "very well." Only 3.6% said their child performed "poorly." The next question asked parents how their child performed in team sports, like soccer or basketball. The highest percent was 32.1% of parents reporting their child performed "good." The lowest was 10.7% of parents reporting their child performed team sports "fair" and "poor." When students were asked how much they enjoyed being physically active 86.4% responded with "really enjoy" and 13.6% said "neutral." No students reported "do not enjoy" (Table 4).

Table 4

Parent Perspectives of their Students Physical Activity Levels and Students Enjoyment in Engaging in Physical Activity

Parent Question	Parent Response %	Student Question	Student Response %
1. How do you feel your child's current physical activity levels are day-to-day?	VW 50 G 21.4 F 21.4 P 7.1 UR	1. How much do you enjoy being physically active?	E 86.4 DE N 13.6
2. How do you feel your own current physical activity levels are with your child day-to-day?	VW 7.1 G 25 F 32.1 P 32.1 UR 3.6		
3. How do you feel your child currently performs in individual sports or activities, such as swimming, biking, rock climbing, dance etc.?	VW 53.6 G 28.6		

Parent Question	Parent Response %	Student Question	Student Response %
	F 14.3 P 3.6 UR		
4. How do you feel your child currently performs in team sports or activities, such as soccer, softball, basketball, volleyball etc.?	VW 25 G 32.1 F 10.7 P 10.7 UR 21.4		

Note. VW=very well, G=good, F=fair, P=poor, UR=unable to rate, E=really enjoy, DE=does not enjoy, N=neutral.

The final three questions were multiple choice, parents were asked to mark all answers that applied to them. The first question asked parents what locomotor skill they felt most comfortable participating in with their child. The locomotor skill skipping was the highest percent (71.4%), followed by running (64.3%), jumping, leaping and galloping all at 57.1%. The lowest were hopping (46.4%) and sliding (35.7%). The next question asked parents what manipulative skills they felt most comfortable participating in with their child. Catching was the highest (85.7%) and the lowest was the two-hand strike at 53.6%. The final question asked how many days in a week parents participated in physical activity with their child. The highest percent (53.6%) of physical activity took place 2-3 times a week and the lowest (7.1%) was 5 or more days a week (Table 5).

Final questions on the student survey were multiple choice responses. Students were asked what locomotor and manipulative skills they felt most confident doing. Running was the highest for locomotor skills (86.4%) and kicking (72.7%) was for manipulative skills. The lowest percentages were galloping (31.8%) and dribbling (40.9%). The last question asked students how often they participated in physical activity weekly with their parents. The highest percent was 22.7% for five days a week or more, and the low was 13.6% for 0-1 days a week (Table 5).

Table 5

Parent Enjoyment in Engaging in Gross Motor Skills with their Student and Students Confidence in Performing Gross Motor Skills

Parent Question	Parent Response %	Student Question	Student Response %
1. What locomotor skills do you feel most comfortable participating in with your child?	Running 64.3 Jumping 57.1 Skipping 71.4 Hopping 46.4 Sliding 35.7 Leaping 57.1 Galloping 57. 1	1. What type of locomotor skills do you feel most confident doing?	Running 86.4 Jumping 59.1 Skipping 63.6 Hopping 40.9 Sliding 54.5 Leaping 63.6 Galloping 31.8
2. What manipulative skills do you feel most comfortable participating in with your child?	Catching 85.7 Kicking 67.9 Overhand Throw 75. Underhand Throw 78.6 Two Hand Strike	2. What type of manipulative skills do you feel most confident doing?	Catching 68.2 Kicking 72.7 Overhand Throw 68.2 Underhand Throw 50 Two Hand

Parent Question	Parent Response %	Student Question	Student Response %
	53.6 Single Hand Strike 67.9 Hand Dribbling 64.3		Strike 50 Single Hand Strike 50 Hand Dribbling 40.9
3. On an average week, how often do you participate with your child in physical activity?	0-1 day 21.4 2-3 days 53.6 3-4 days 17.9 5 or more days 7.1	3. On an average week, how often do you actively participate with your parent(s) in physical activity?	0-1 day 13.6 2-3 days 31.8 3-4 days 31.8 5 or more days 22.7

Discussion

The purpose of this study was to determine if a parent's perception of their child's gross motor abilities accurately reflected their child's enjoyment of GMS performed and to determine if parent perception and time spent being physically active with their child influenced their child's enjoyment of a GMS. The researchers hypothesized parents' perceptions would have a significant similarity to their child's actual ability to perform GMS and that parents who believed their child demonstrates high levels of gross motor competence would have a child that enjoyed performing that gross motor skill. Second, researchers hypothesized parents who spent time being physically active with their children would have children that enjoyed being physically active.

Previous researchers have demonstrated a connection between a child's enjoyment of GMS and parent's perception of their child's ability to perform GMS (Welk, 1999). A majority of the student participants in this study reported "really enjoy" performing locomotor skills (running and skipping). This may be due to many of these movements being fundamental movements for individual and team sports. Enjoyment of these skills could also be due to both parent and child engaging in them frequently with one another, therefore parents feel more comfortable performing these skills with their child and their child has more confidence performing these skills. Conversely, half of the student participants indicated that they did not enjoy performing the gallop. This may be due to the gallop being an awkward movement that is seldom practiced or used in combination with other movements.

There was a consistent trend of responses for manipulative skills. More parents reported their child performed these skills as “good” or “fine,” whereas more parents reported that their child's performance as “very well” for locomotor skills. Of the manipulative skills, students identified kicking as the most enjoyable. These results were similar to the parent responses which demonstrated an overall perception of their child as good or very good at kicking. Therefore, children who are regularly physically active will enjoy being physically active and are therefore less likely to engage in a “negative spiral of disengagement” towards physical activity (Moore, et al., 1991). Conversely, the student participants listed dribbling, single hand strike, and two-hand strike as their least enjoyable manipulative skills to perform. Parent responses reflected similar results. The dribble, single hand strike and two-hand strike had the lowest percentages of parents feeling comfortable performing these skills with their child. These results indicate student participants are not participating in sports or activities (e.g., basketball, tennis and badminton) that promote these particular movements.

Finally, a large majority of the student participants identified as enjoying being physically active. These results were similar to parent participants who perceived their student’s physical activity levels to be at good or very well level. Parents also reported their weekly level of physical activity to be similar to their child’s response. Both participant groups reported to be physically active with one another 2-3 or 3-4 times a week. Indicating children’s level of enjoyment may influence how often parents are physically active. The results are similar to multiple reports that have demonstrated children have higher physical activity levels at a young age when they have parents who

are active with them (Malina, 2012). As (Higgs, et.al., 2008) reported children who develop a foundation of proficient motor skills from a young will have increased opportunities to remain physically active throughout their lifespan.

Limitations

Limitations within this study consisted of a low number of participants for both parents and students. There were 50 total participants, ideally this number would have been more than 100 participants. Since the survey was sent out to only one school, it affected sample size and diversity within the study. Students and parents in the study were from similar socioeconomic backgrounds and race. The majority of participants were white and from upper middle-class families. Due to the lack of diversity, there were homogeneous outcomes of parents with high perceptions of their child's ability and children that really enjoyed performing GMS. Since the survey could not be conducted in-person, there is reason to believe that also reflected a lack of diversity as well as bias. Due to the COVID 19 Pandemic, all local schools were teaching virtually during this time. Another limitation was students and parents did not see the skills demonstrated in-person but received an image of each skill. Not seeing the skills performed in-person could have given participants a misconception of what good versus poor performance of a skill looked like. Parental influence also could have interfered with student responses. Since the surveys were completed at home, it is likely that kindergarten and first graders needed more support from parents answering questions, which may have influenced their responses.

Future Research

The current study consisted of participants that were young children and adolescence. Further research could consist of a targeted age group for more accurate data collection. As children reach adolescence their perception of performance ability increases, as does their preference for GMS. To research adolescents' perceptions of skill ability and enjoyment of GMS would yield more reliable results. Additionally, researchers could gather data from multiple schools across the county to have more diversity and potentially more heterogeneous outcomes. Data could be gathered from low income, middle class and affluent families to further study how that influences participant perceptions and ability to perform GMS.

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