

12-2013

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# The Relationship Between Grit and Montessori: An Educational System

An Action Research Report  
By Asma Nayef Dahbour

## The Relationship Between Grit and Montessori: An Educational System

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Submitted on October 24, 2013  
in fulfillment of final requirements for the MAED degree  
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St. Paul, Minnesota

Advisor: \_\_\_\_\_ Date: \_\_\_\_\_

Abstract

Grit, patience and perseverance are cornerstones of Maria Montessori's pedagogy and the basis of this research. The purpose of this study is to describe how grit, patience and perseverance are character traits that help students reach their highest academic potential, and are essential to students' capacity to succeed and accomplish long-term goals. I used qualitative and quantitative inquiry to determine if the Montessori method elaborates grit and patience in children. The research took place in a children's house classroom located in an urban Montessori school. The results determined that students who received a Montessori education did have more grit and patience toward their long-term goals.

## The Relationship Between Grit and Montessori: An Educational System

Asma Dahbour

October, 2013

### Abstract

Grit, patience and perseverance are cornerstones of Maria Montessori's pedagogy and the basis of this research. The purpose of this study is to describe how grit, patience and perseverance are character traits that help students reach their highest academic potential, and are essential to students' capacity to succeed and accomplish long-term goals. I used qualitative and quantitative inquiry to determine if the Montessori method elaborates grit and patience in children. The research took place in a children's house classroom located in an urban Montessori school. The results determined that students who received a Montessori education did have more grit and patience toward their long-term goals.

Advisor: Amanda Perna

The purpose of this study was to find out if the Montessori system would improve grit in children and if Montessori activities helped students become more patient towards their work and long term goals. I hypothesized that the Montessori method would help students to become more patient vs. students who did not receive Montessori education.

The research took place in different classrooms. I targeted Montessori schools with specific days to interview the teachers and observe their classrooms.

The population I concentrated on was specific to young children attending Kinder Casa. The total number of children I observed was 53, 13 of whom were newly registered students in the Montessori program.

This research paper prompted me to research studies and academic journals to support my hypothesis. Walter Mischel conducted an experiment in which he took young children and gave each of them one marshmallow. He left the room and observed how long they waited before eating the marshmallow. He would give them a second marshmallow as a bonus for waiting. The most fascinating thing about this study is not that some children could wait the entire time, which was 15 minutes, but the longitudinal study that followed the children throughout their early educational lives. It demonstrated that the amount of time a child could wait was an almost direct predictor of future academic and personal success (Cemore & Herwig, 2005).

Fourteen years later, Mischel found out that the children who ate the marshmallow soon after receiving it-suffered low self-esteem and were viewed by others as stubborn and easily frustrated. The children who waited to get the bonus marshmallow had better coping skills, were more socially competent, self-assertive, trustworthy,

dependable, academically successful, and scored about 210 points higher on the SATs (Casey, 2011).

In the article “*What You Need to Know about Willpower: The Psychological Science of Self-Control*” that the marshmallow study didn’t end there. Recently, B.J. Casey, PhD, of Weill Cornell Medical College, along with Mischel, Yuichi Shoda, PhD, of the University of Washington, and other colleagues tracked down 59 subjects, now in their 40s, who had participated in the marshmallow experiments as children.

Researchers tested the subjects’ willpower strength with a laboratory task known to measure self-control in adults. They found the differences in willpower had largely held up over the past four decades. In general, children who were less successful at resisting the marshmallow all those years ago performed more poorly on the self-control task as adults (Mischel & Ayduk, 2004).

In another research study, Duckworth (2007) sought a brief, stand-alone measure of grit that met four criteria: evidence of psychometric soundness, face validity for adolescents and adults pursuing goals in a variety of domains (e.g., not just work or school), low likelihood of ceiling effects in high-achieving populations, and most importantly, a precise fit with the construct of grit (Duckworth, 2007). He believes that individuals who have a high level of grit work steadily toward their goals, despite obstacles and challenges along the way. He indicated that students who have a patient character tend to overcome failure and boredom to complete projects (Duckworth, 2007).

In a research of high-risk-college students, Sriram, (2011) finds that their ability to learn can be increased, and they may be less likely to give up if they show more grit. It is important to note that the teacher plays an essential role in improving grit in the

student, and it is the teacher who encourages the student to do certain tasks to support this goal. The teacher may observe students and record the progress of their social characteristics. Steve Eddison roused a critical point about this in his article “*Showing True Grit*”. Eddison explained that the teacher has a major role: to instill grit in students. The students learn how to be patient by doing projects and committing to learning and completing them; for instance, the teacher may choose selective activities that need time to be completed such as planting or painting in the classroom. These activities require patience and grit to reach the final stage of that work.

The relationship between grit and school performance is attractive, and led me to consider multi-age students. According to Gutloff’s (1996) research, multi-age classrooms require an integrated curriculum and adjusted teaching style, which may call for further teacher training. “Teachers stay with the same students for more than one year, giving them more time to discover the strategies best suited for each student. Teachers in these classrooms should not depend on traditional assessment methods” (Gutloff, 1996). He also explained that multi- age students help students develop grit toward each other; this phenomenon can be explained from both sides. The older students may have the grit to teach younger students, and the younger students may have the patience to observe and learn from older students. McKenzie and Zascavage discuss the Montessori method as an effective education approach for students with disabilities as well as multi-age students in an inclusive setting. They believe that there is specific instruction needed for students to follow to have a successful academic career. McKenzie and Zascavage state that the role of the Montessori method is to provide “a classroom that values all students and is individualized to meet the needs of each student” (McKenzie and Zascavage, 2012), and

they believe that the interaction between these students creates a sense of patience to each child's ability.

Teaching young children techniques to improve their grit is not a privilege. It is one of the basic foundations that every educator should teach. The skill should be given the same level of necessity as math, language, and art. In the article by Whitney Borton entitled "*The Dirt on Grit*," researchers found that grit positively predicted three subscales of school adjustment as well as self-reported schools performances. They also found that an incremental theory of intelligence positively predicted grit.

"*Thank you for Your Patience*" is an article that examines patience in pupils. Skolnik (2009) found that patient children often grow into star pupils. His article provided some suggestions for educators and parents who would like to instill patience in their children. Some of his suggestions are: praise the child when they wait for your instructions, deliver promises to emphasize the understanding of patience, and do not rush to give them what they ask for. Additionally, Hoerr asserted in his article "*Got Grit*" that every child needs to learn how to back up from failure and frustration, and he believed that teaching children to have grit and patience towards their goals even if they fail at something is more important than teaching them how to be successful all the time. His argument is based on human beings and how everyone makes mistakes or fails at some point, and failure is normal as long as the students empower their grit to eventually succeed. Hoerr states in his article that "we need to take ourselves out of our own comfort zones and learn how to respond to frustration and failure, and just maybe we'll develop grit too" (Hoerr, 2012).

Intrinsic motivation is one of the hallmarks of Montessori; indeed, there is much current research about the relationship between intrinsic motivation and high academic achievement. Gottfried (2001) conducted a study about intrinsic motivation and concluded that intrinsic motivation enhances grit in children. He argues that grit makes students work to achieve something for the sake of learning and well-being and not associated with objects such as stickers or tokens. Gottfried states that intrinsic motivation is a reliable, valid, and significant construct; furthermore, he found that intrinsic motivation positively related to achievement, IQ, and perception of competence. This study demonstrated that intrinsic motivation is the other face of grit and it is significant in increasing stability towards important goals. One of the major keys is to establish it early with young students to prevent potential failure cycles.

The current research investigates grit in students attending Montessori. My research starts with a review of literature on the Montessori Method, grit and patience to provide a foundation for the research I conducted. I provide my professional, theoretical and personal bias. Next I discuss the methods I used in this study followed by results. A discussion and interpretation of my results followed. I ended the study with the detailed list of all references cited in the paper, and conclude the study with the appendix, and additional documents containing useful additional information pertinent to the study. Therefore the interest of this study is based on my research question: Does the Montessori method elaborate grit?

#### The Research Process

My research question aimed to examine the hypothesis of the study. Duckworth indicated that "grit" and intelligence are two completely independent traits, and suggest

that the education system should focus more on developing “grit” and “patience” rather than preoccupying themselves with constant measurements of intellectual and other abilities regarding aptitude (Duckworth, 2007).

The study was conducted in two different classrooms to ensure accuracy and no personal bias. These classrooms are located in an urban Montessori school.

The school has 18 classes for infants, toddlers, preschoolers, and senior kinder casa. I chose to conduct my research in the senior kinder casa classes because the children are all age five to six years old. Of the two senior kindergarten classes, I named the first class Casa A and the second class Casa B so they would be easily distinguishable. In Casa A there were 24 students with two teachers and one assistant teacher. Amongst the 24 students, 8 of them were newly registered to the school. In Casa B there were 23 students with one teacher and two assistant teachers. There were 5 newly registered students in Casa B.

The major goal of my study was to find out if the students who pass through the Montessori method of teaching have more grit and patience than those students who do not have a Montessori background.

This research was quantitative and aimed at determining the relationships between two things in a population, one of which must be an independent variable and the other, a dependent variable. The independent variable is the level of grit in children while the dependent variable is Montessori as the method of education. Quantitative research designs are either descriptive or experimental (Moore and McCabe, 2006). However, I used both designs to increase the probability of obtaining accurate results that may serve humanity. (Moore and McCabe, 2006).

I started my research on September 3rd, 2013. Prior to starting that process, I obtained permission from the principal of the school, and scheduled an interview with the teachers to explain the research process to them as well. This included informing them about the survey. In addition to the initial meeting, I distributed questionnaires at the beginning of my research so the open-ended questions would allow the teachers to fully express views that would not be affected by the circumstance of the study.

The questionnaires were given randomly to the teachers and were confidential. I left a box in the staff room for the teachers to drop off the questionnaires. Moore and McCabe (2006) stated that random sample is a sample in which every element in the population has an equal chance of being selected.

The population in this part of the study was teachers at the school. Teachers who decided to take the questionnaire demonstrate a sample percentage of the total number of teachers in the school. (Moore and McCabe, 2006).

The first method of data collection was the use of a questionnaire containing five statements and one question (Appendix A):

1. Group Y completes their task accurately more than group W: strongly agree, agree, neutral, disagree, strongly disagree.
2. Group Y shows more patience to reach the set goal than group W: strongly agree, agree, neutral, disagree, strongly disagree.
3. Group Y stays on task for a longer period than group W: strongly agree, agree, neutral, disagree, strongly disagree.
4. Group Y listens and pay attention during the circle time more than group W: strongly agree, agree, neutral, disagree, strongly disagree.

5. Group Y respects taking turns more than group W: strongly agree, agree, neutral, disagree, strongly disagree.

6. Do you think that the Montessori method elaborates grit in children?

7. Why or why not?

These questions were meant to determine teacher's opinions about students who have a Montessori background versus students who do not. The questionnaires were handed to the teachers on September 3rd, 2013 and were collected the same day.

My research process covered the period of September 3rd – September 26th, 2013. I set my schedule to allow enough transition time between classes, and to accommodate the classroom's daily schedule. I used an identical procedure in Casa A and Casa B.

The major challenge I faced in my study was sample size. According to Moore and McCabe, sample size is called Power Analysis. To them, power analysis determines the sample size required to detect an effect in a given size with a degree of confidence (Moore and McCabe, 2006, pg. 192).

I had 47 students in total, but only 13 students out of that number were newly registered to Montessori school; thus, I decided to balance the probability of the power analysis. I followed Moore and McCabe's suggestion about random sampling. They call random sampling SPS. They say, "A simple random sample (SPS) of size  $n$  consist of  $n$  individuals from the population chosen in such a way that every set of  $n$  individual has an equal chance to be the sample actually selected" (Moore and McCabe, 2006, pg. 189).

To apply this theory to my procedure, I chose the 13 new students and labeled them group W. The challenge was with group Y who presented the students with

Montessori background because their numbers were exceeding the numbers of group W. I came up with a solution by getting a random sample from them. I played a number game with everyone in each class, where I gave each student from group Y a number, I had a jar of another set of these numbers, and I asked one of the teachers to choose 13 cards which were presented to 13 students for group Y. The total number of students in both groups was 26 students

My second method of data collection was the use of observation to perceive the students in real life situations. I used anecdotal forms and observational reports

(Appendix B):

1. Finished his/her work completely: agree, neutral, disagree.
2. Stay on task, and show accuracy: agree, neutral, disagree.
3. Listens patiently at circle time: agree, neutral, disagree.
4. Respecting turns cooperatively: agree, neutral, disagree.
5. Applies many trials to figure out action work creatively: agree, neutral, disagree.
6. Description of student's behavior: \_\_\_\_\_.

I found that observing students directly, without applying any preparation or restrictions on their environment, made these reports valid and ensured the reliability of the study. I used the same report for both groups, and I observed them in different situations fairly and equally. While observing the students I concentrated on two areas; inside the classroom while they were working, rotating activities, or doing group work and outside the classroom when they would go for recess to play. It was interesting to mark down how they interacted with each other out of the classroom and how they played. The fascinating thing about this observation was how much grit the students had towards their

final goal and the level of patience they had to have to complete their work successfully. This was a factor in academic achievement and helped me to make my final decision on whether to accept or reject the hypotheses. The anecdotal record provided cumulative information and clear tracking for each child's behavior. It was one of the tools used to gather specific information and determine if there was any progress or not. Furthermore, it enabled me to record details about grit and patience.

I observed group W and group Y for 16 days, and on September 24, 2013, I examined both groups sample work because it was my third strategy for collecting data. The sample of the student's work (see appendix C) was essential for compiling the picture of my research. To avoid bias, I asked the teachers to make a chart for each student's name and give that name a number to track the results at the end of the study. I did this because I wanted to make a fair judgment without having access to the students' identity. Hiding the student's identity motivated me to categorize the samples based on the work quality and not based on the student's group.

I conducted the final experiment on September 25th, 2013. This experiment was the last stage before analyzing the data. The experiment was a basic activity within teacher-student conferences. I brought 5 new puzzles to attract the children.

The puzzles have various themes such as Jungle Journey, Under the Ocean, or Animals on the Farm. Each puzzle has 24 pieces, and a child can match these pieces inside a wooden frame base (see Appendix D). I assigned the study sample (26 students) to the puzzles. The puzzles needed approximately two minutes to be solved. Each student had a chance to work with any set of the puzzle after he/she carefully understood the choices of the activity. I had two choices, which were: if the child decides to place the

last piece of the puzzle immediately, he/ she will be able to work with that puzzle only once. The other choice was that if the child waited until the next day to place the last piece of the puzzle, s/he would be allowed to play with the puzzles more than 10 times.

The choices were meant to encourage the child to make a decision while playing with the materials. The child can match all the puzzle pieces until he/she gets to the last piece to complete the puzzle. At that moment the child must decide between one of my two choices. Either way they are allowed to locate the last piece, either to put it in place or to save it. Choice is related to what Maria Montessori called autonomy; autonomy is acting with choice. But “choice feeds autonomy, and autonomy usually requires choice.”(Montessori, 1996).

The teacher helped to organize the Teacher-Student-Conferences by inviting the students in one after another to ensure that the results were collected individually. However, I did not disclose the purpose of this activity, to reach the standard of the double-blind study. A double-blind study is when neither the teacher nor the students know the purpose of the presentation (Moore and McCabe, 2006).

I completed the data collection on September 26, 2013. I had all the required elements to analyze my data with graphs and specific comparative points.

#### Analysis of Data

I examined each of the data separately to ensure the independence of the results and outcome. I inspected the performance outcome of each group and compared their results at the end of the study. This strategy allowed me to observe each student within his/her group.

I collected the surveys at the beginning of the study. The total number of completed surveys showed that 13 of the 14 teachers emphasized that students with Montessori backgrounds have more grit towards completing their task. One teacher did not believe in that notion and defended her belief based on the nature of each child. She holds that each child has a personality that cannot be changed from attending one school versus another.

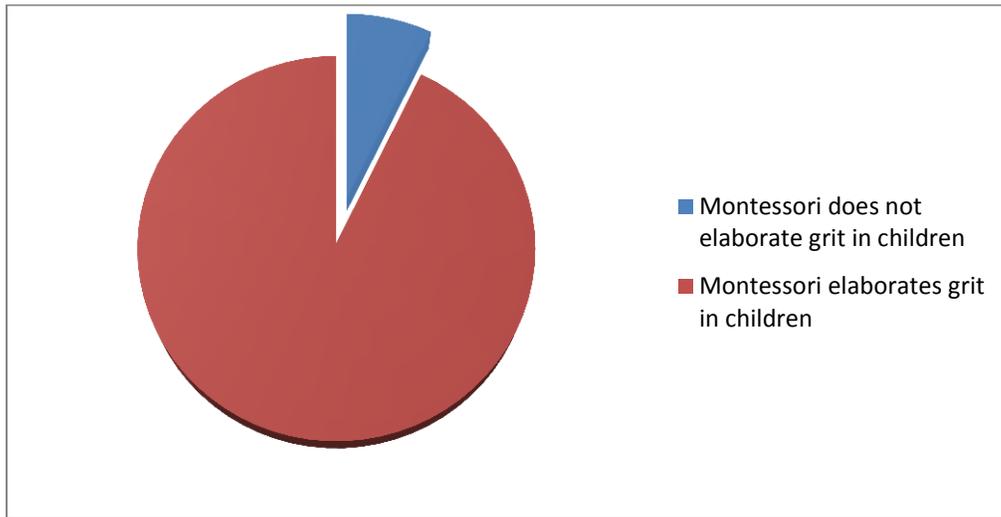


Figure 1. Teacher Beliefs Toward Grit.

Figure 1 shows that 92.8% of teachers believe that the Montessori method would elaborate grit in children. 7.1% of teachers assume that the differences may be related to the student's personality.

I observed 26 students in two different classes. Group W presented 13 students who were newly registered to Montessori schools, and group Y presented 13 students who had been attending Montessori school for 2 – 3 years prior.

The observation reports followed by the anecdotal format indicated that group Y had more grit in reaching a completion of the material; they have more patience when completing their tasks. I examined each group individually to avoid personal bias.

Eleven children in group W did not complete their work all the time, and often the teacher had to remind them to stay on task. These students were more likely to start an activity, but did not spend enough time on it to reach the final stage of that activity. Two children showed more grit toward finishing their work; they observed other children to learn something new. They learned, for example, working with materials may require multiple steps to be solved, and it may take more time to figure out a challenging activity.

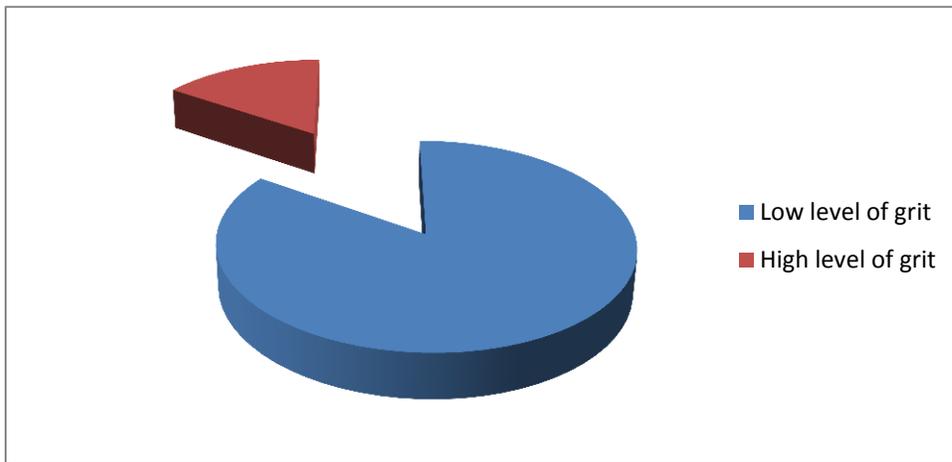


Figure 2.A. Level of Grit in Group W.

Figure 2.A indicated that 84.62% of group W did not show a high level of grit towards their work. 15.38% showed an acceptable level of grit and patience.

Based on my observational reports, I found a significantly high level of grit in group Y. Twelve students of the group were patient until their work was completely finished. Only one student did not show enough patience and grit to complete the tasks successfully. The student worked with three activities one after another, but he did not reach the final step of any of these activities.

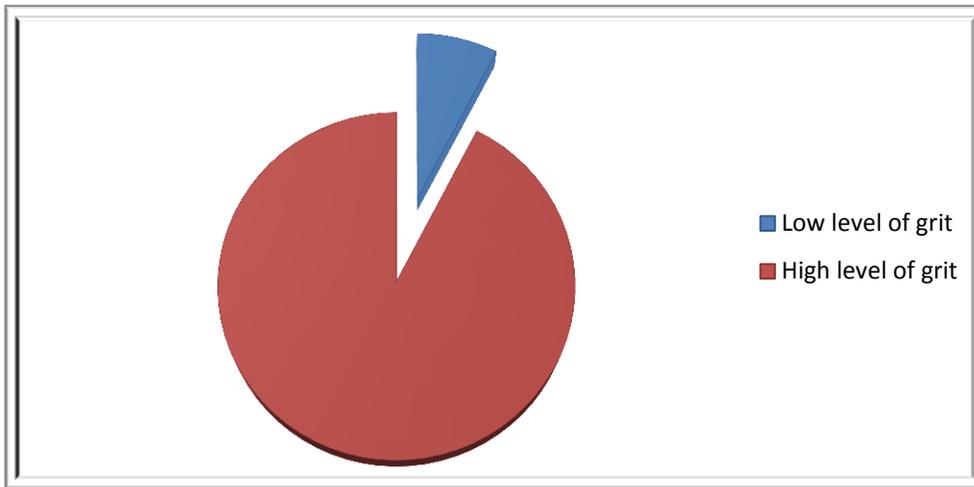


Figure 2.B. Level of Grit in Group Y.

Figure 2.B indicated that 92.4% is the overall percentage of students who showed grit and 7.6% of the students did not show a high level of grit.

Student work samples were another piece of data analysis. Specifically, I applied rational judgment to the students' work without having access to their identity. The sample work was mainly math, or language worksheets.

In group W, there were 9 students who did not complete their work and their sample did not show accuracy in coloring or in following the instructions they were given on how to do it. Three students had a higher level of accuracy in their work.

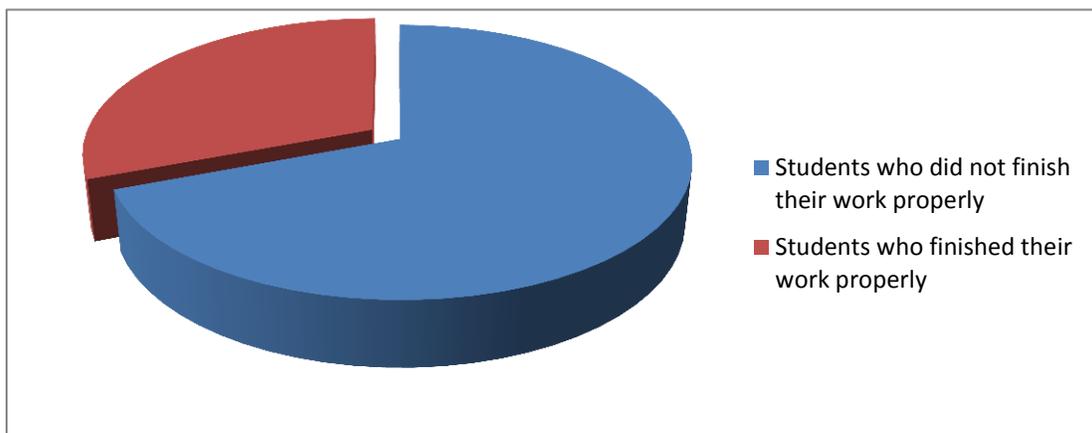


Figure 3.A. Work Completion for Group W.

Figure 3.A showed that 69.2% of group W did not have the significant level of patience to complete their work, while 30.8% finished their work properly.

The majority of students in group Y finished their tasks successfully and their coloring was more accurate than the sample work of group W. The majority of the students had sufficient time to finish the coloring sheet, and the coloring strategies were evident that the students has grit to complete the work with high level of expectation. None the less, two students in group Y did not finish their work, and then they did not apply enough patience to color their art sheet.

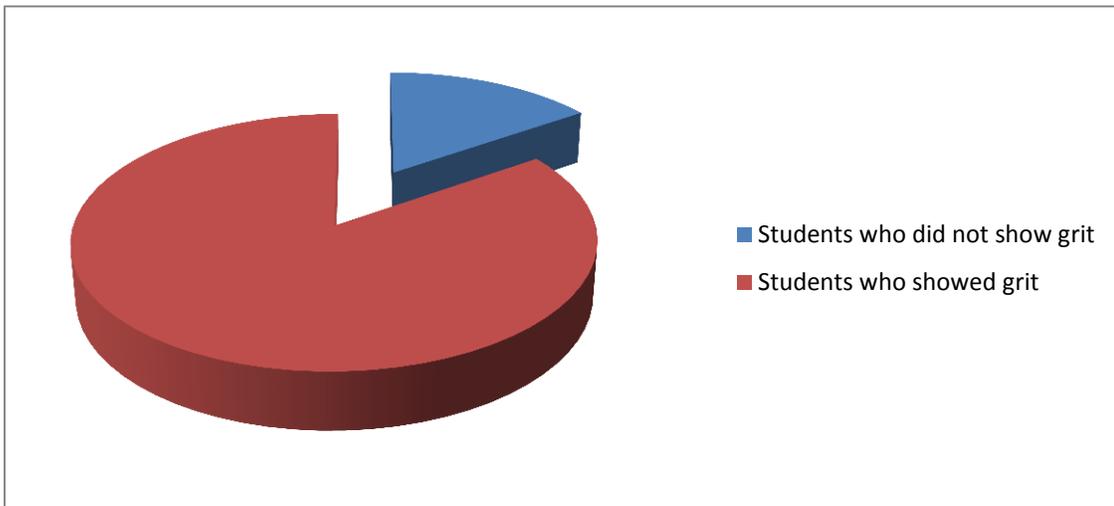


Figure 3.B. Work Completion for Group Y.

Figure 3.B shows the level of patience that students applied in group Y towards their work. 15.38% did not show grit.

The last data collection of this study depended on the puzzle activity. I structured choices and rules to work with the puzzle to determine if the student had a high level of grit toward working with the puzzle more than once.

This strategy may demonstrate in depth weather the student had desire to obtain long-term goals or not. I worked individually with each student and the teachers worked

with me to complete this activity with all the students in both groups. The teachers did not know the purpose of the activity; however, they explained the rules of the activity to their students.

They allowed the students to make the decision of playing once if they replaced the last piece of puzzle immediately or playing as much as they wished if they saved the last piece of the puzzle for the next day.

This strategy is what Dr. Montessori recommended in her statement “we discovered that education is not something which the teacher does, but that it is a natural process which develops spontaneously in the human” (Dr. Montessori, 1996).

In group W, 10 students (76.9%) decided to play it once and they placed the last piece of puzzle immediately. Three students (23.1%) decided to keep the piece for the next day, so they could play with the puzzles as much as they wanted.

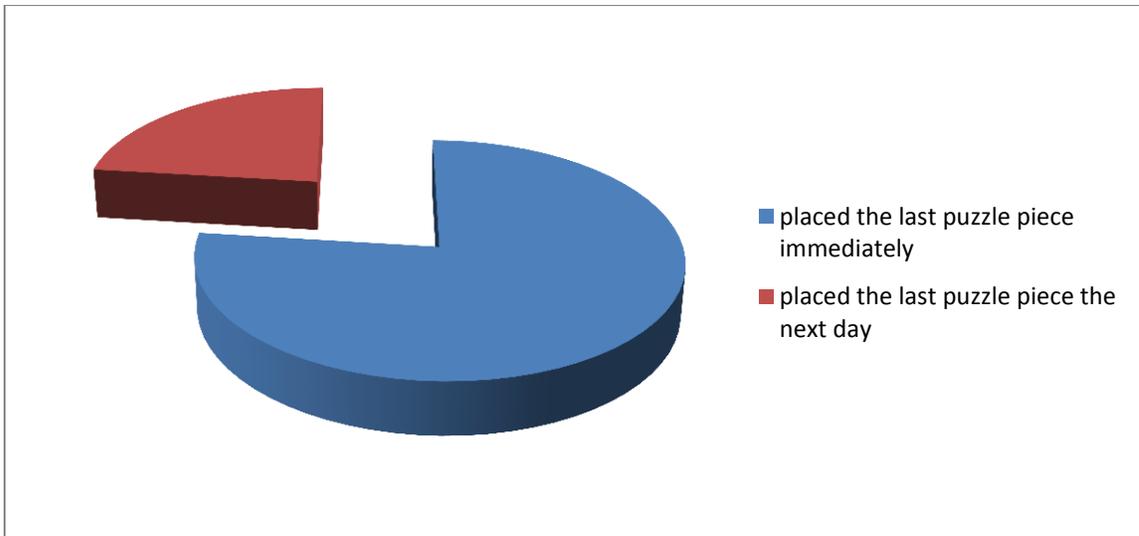


Figure 4.A. Puzzle Strategy for Group W.

Figure 4.A shows the level of patience towards completing the puzzle by group W.

In group Y, 4 students (30.7%) decided to play it once and they placed the last piece of puzzle immediately. 9 students (69.2%) decided to keep the piece for the next day, so they could play with the puzzles as much as they wanted.

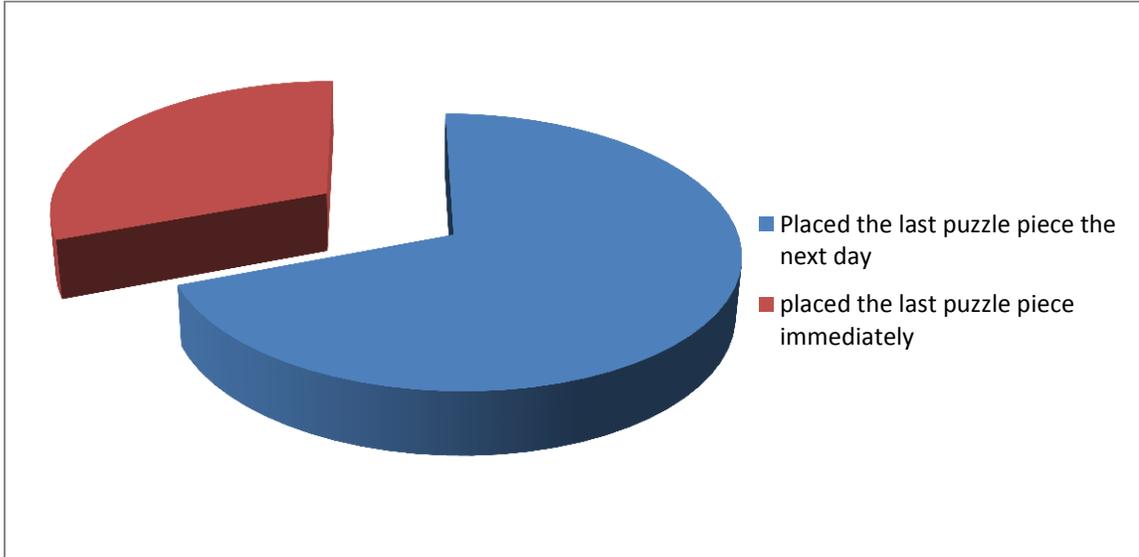


Figure 4.B. Puzzle Strategy for Group Y.

Figure 4.B shows the level of patience towards completing the puzzle by group Y.

The data collection indicated that group Y has more grit than group W. Group Y showed a higher level of grit towards completing their work successfully. They also applied more patience when achieving long-term goals.

I concluded that my hypothesis was correct and I accept the idea that Montessori elaborates grit; thus, I have to emphasize this phenomenon by examining the Montessori system as an educational method.

Dr. Montessori’s philosophy may clarify the outcome of this experiment and give some answers to the research question – does the Montessori method elaborate grit in children? This point of concentration in my research may delineate the relationship between Dr. Montessori’s method and the level of grit in children, and conclude that

students who receive a Montessori education are more likely to show higher levels of grit and patience.

Dr. Montessori designed her materials in a logical and gradual sequence to encourage children to learn from one activity to another. This sequence helped them to obtain grit regarding the mastering of concrete activities and to make them ready to work and handle the abstract materials independently. This gradual sequence teaches students to take their time and understand the relations and links between the lessons and presentations.

Dr. Montessori depended on base ten activities such as the red rods, number rods, pink tower and the brown stairs. Dr. Montessori structured a certain way of transferring the pieces involved in the activity from the shelf onto the carpet or table. This transferring was well-thought-out in such a way that the students had to move one piece at a time, even though the students could move the last three pieces in one step. Furthermore, a student needs to carry each piece with care and attention to maintain a safe environment. This strategy helped improve patience in children and instill grit to make ten trips to transfer these pieces. Maria Montessori intended to develop grit by watching their work progress from basic to advanced steps.

Maria Montessori had deep insight into a multi-age classroom, which allowed children to develop deep and meaningful relationships with classmates whose ages could span a difference of up to three years. This combination creates a unique social setting between younger students who observe the older students and students from them. This observation instills patience, and allows younger students to learn while older students help to develop grit by teaching the younger children and showing them the work

repeatedly. In the Montessori program, students work with intrinsic motivation to learn. Intrinsic motivation teaches Montessori students to be patient for the sake of their well-being and helps to develop a desire to become competent and independent human beings. Student's behavior is motivated by an internal desire to participate in an activity for their own sake and the sake of reaching their final goal. Hoerr's (2012) research is somewhat relative to Dr. Montessori and her philosophy of self-correction. Dr. Montessori provided a path for the child to learn, fail, and succeed by learning from his/her mistakes and figuring out where the error occurred. Therefore, the Montessori teacher has a role as a guide and advisor for certain activities that help students develop patience and higher levels of grit.

The Montessori system uses a unique combination of all these studies and research. I believe that Montessori would be the most beneficial system for students to improve their grit for the following reasons:

- The sequence of using the Montessori materials.
- The strategy of transferring the materials (one after another).
- The intrinsic motivation theory in Montessori.
- Self-correction strategy.
- The multi- age students in a Montessori classroom.
- Montessori teachers as role models.

Finally, the synthesis of the researchers' perspectives and the analysis of the data collection reveals that Montessori as an educational method develops a higher level of grit and patience in children. Therefore, the hypotheses outlined in this study may

educate the reader about the Montessori method and encourage them to want to know more about Dr. Montessori's philosophy.

### Action Plan

The purpose of this research study was to determine if Montessori, as an educational system, would elaborate grit in children. Grit, patience, and perseverance are character traits that help students reach their highest academic potential. In fact, many researchers and psychologists are currently devoting their time and studies to finding out how to instill grit and elaborate the level of patience in children, as these character traits lead to successful students.

Teacher survey results generated important information about students who have been receiving a Montessori education vs. students who are newly registered at the Montessori school. The majority of teachers believed that students who have Montessori as a background are more likely to be patient when it comes to completing their work.

The second part of the survey consisted of an open-ended question, which allowed teachers to record their opinions about the study and the differences they noticed between the students. The answers indicated that students who are newly registered to the school are less likely to choose challenging work, and tend to work halfway.

I examined 26 students using various types of data collection, including observational reports, samples of student's work, and an experiment to find out if my hypothesis was correct. In the experiment, I divided the students involved into two groups. Group W represented the students who were newly registered with the Montessori school, and group Y represented the students who had attended Montessori school for several years.

I observed each student within his/her group to ensure accuracy and validity. It was interesting to find that the majority of group W only worked halfway through. When I examined their sample work, I found that 69.2% of the students did not apply patience when coloring the assigned work sheet, nor did they apply any strategic methods to complete their work.

Another experiment tested was about different sets of puzzles. Each puzzle had 24 pieces and a child could match those pieces inside a wooden frame base. I gave the children two options, which were: if the child decides to place the last piece of the puzzle immediately, he/ she would be able to work with that puzzle only once. The other option was that the child could wait until the next day to place the last piece of the puzzle, and would then be allowed to play with the puzzles more than 10 times. 76.9% of the students in group W decided to finish the puzzle immediately.

I conducted the same experiment to examine group Y. It was then I found that my hypothesis regarding this research study was correct for several reasons. The majority of the students in group Y were more likely to complete their work. The students had high levels of grit, which enabled them to color their assigned work sheet with successful strategies. Many of them completed their work with accuracy. 96.2 % of the students in group Y decided to match the last piece of their puzzle the next day. Their ability to delay gratification was evidence that Montessori helps to elaborate grit in children.

Describing the results of this study was associated with examining Dr. Montessori's philosophy about self-control and autonomy. Dr. Montessori's strategies regarding transferring the materials, self-correction, and intrinsic motivation are among the numerous examples that show how her methodology instills grit in children.

I maintained the most important factor in this study which is testing students of the same age. However, if I had the opportunity to further my research, I would have examined different areas and ages to outline a more detailed account regarding the relation between grit and Montessori. I would have liked to inspect if the gender of the students would have changed the final result. I would also like to see whether the levels of commitment in Montessori schools are authentic or not, and if the rapid changes in technology would help or hinder the students in being patient toward their academic accomplishments.

Lastly, the action research will help both educators and parents to find the best strategies in the classroom for instilling grit in children and will assist parents in choosing the best education system for their children. Montessori as an educational system elaborates patience and grit in children, and helps the students to achieve their highest potential for success.

## References

- Borton, W., & Grelle, J. (2013). *The Dirt on Grit*. Hanover College. Retrieved July 20, 2013, from psych.hanover.edu/research/Thesis12/papers/Borton %20Grelle.pdf
- Casey, B. J., Somerville, L. H., Gotlib, I. H., Ayduk, O., Franklin, N. T., Askren, M. K., Shoda, Y. (2011). Behavioral and neural correlates of delay of gratification 40 years later. *PNAS Proceedings of the National Academy of Sciences of the United States of America*, 108(36), 14998-15003.  
doi:<http://dx.doi.org/10.1073/pnas.1108561108>.
- Cemore, J. J., & Herwig, J. E. (2005). Delay of gratification and make-believe play of preschoolers. *Journal of Research in Childhood Education*, 19(3), 251-266.  
Retrieved from ProQuest Education Journals
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087-1101. Retrieved from ProQuest Education Journals
- Eddison, S. (2013). Showing true grit. *The Times Educational Supplement*, (5030), 49.  
Retrieved from ProQuestion Education
- Gottfried, A. E. (2001). Academic intrinsic motivation in young elementary school children. *Journal of Educational Psychology*, 82(3), 525-538. Retrieved from ProQuest Education Journals
- Gutloff, K. (1996). Multi-age teaching: Is it for you? *NEA Today*, 14(9), 4 Retrieved from ProQuest Education Journals
- Hoerr, T. R. (2012). Got grit? *Educational Leadership*, 69(6), 84. Retrieved from ProQuest Education Journals

- Montessori, M. (1996). *Education for a new world*. Oxford, England: Clio Press.
- McKenzie, G. K., & Zascavage, V. S. (2012). Montessori instruction: A model for inclusion in early childhood classrooms and beyond. *Montessori Life*, 24(1), 32-38. Retrieved from ProQuest Education Journals
- Mischel, W., & Ayduk, O. (2004). Willpower in a cognitive-affective processing system: *The dynamics of delay of gratification* Guilford Press, New York, NY. Retrieved from ProQuest Education Journals
- Moore, D. S., & McCabe, G. P. (2006). *Introduction to the practice of statistics* (5th ed.). New York: W.H. Freeman and Co..
- Skolnik, D. (2009). *Thank you for your patience*. *Parenting.Early Years*, 23, 108. Retrieved from ProQuestion Education
- Sriram, R. (2010). *Rethinking intelligence: The role of mindset in promoting success for academically high-risk college students*. (Order No. 3421868, Azusa Pacific University). *ProQuest Dissertations and Theses*, 178. Retrieved from ProQuestion Education

Appendix A

**Action Research Survey**

A- Fill in the entire circle that corresponds to your answer for each question. Please indicate how much you agree or disagree with each of the following statements about the children below.

Key Words:

- Group ‘W’ are students who are newly registered in Montessori schools
- Group ‘Y’ are students who are already use to the Montessori learning method

<b>Decisions</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
Group ‘Y’ completes their task accurately more than group ‘W’					
Group ‘Y’ shows more patience to reach the set goal than group ‘W’					
Group ‘Y’ stays on task for a longer period than group ‘W’					
Group ‘Y’ listens and pay attention during the circle time more than group ‘W’					
Group ‘Y’ respects taking turns more than group ‘W’					

B- Answer the following question based on your experience:

Do you think that the Montessori method elaborates grit in children? Why or why not?

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Appendix B: 1

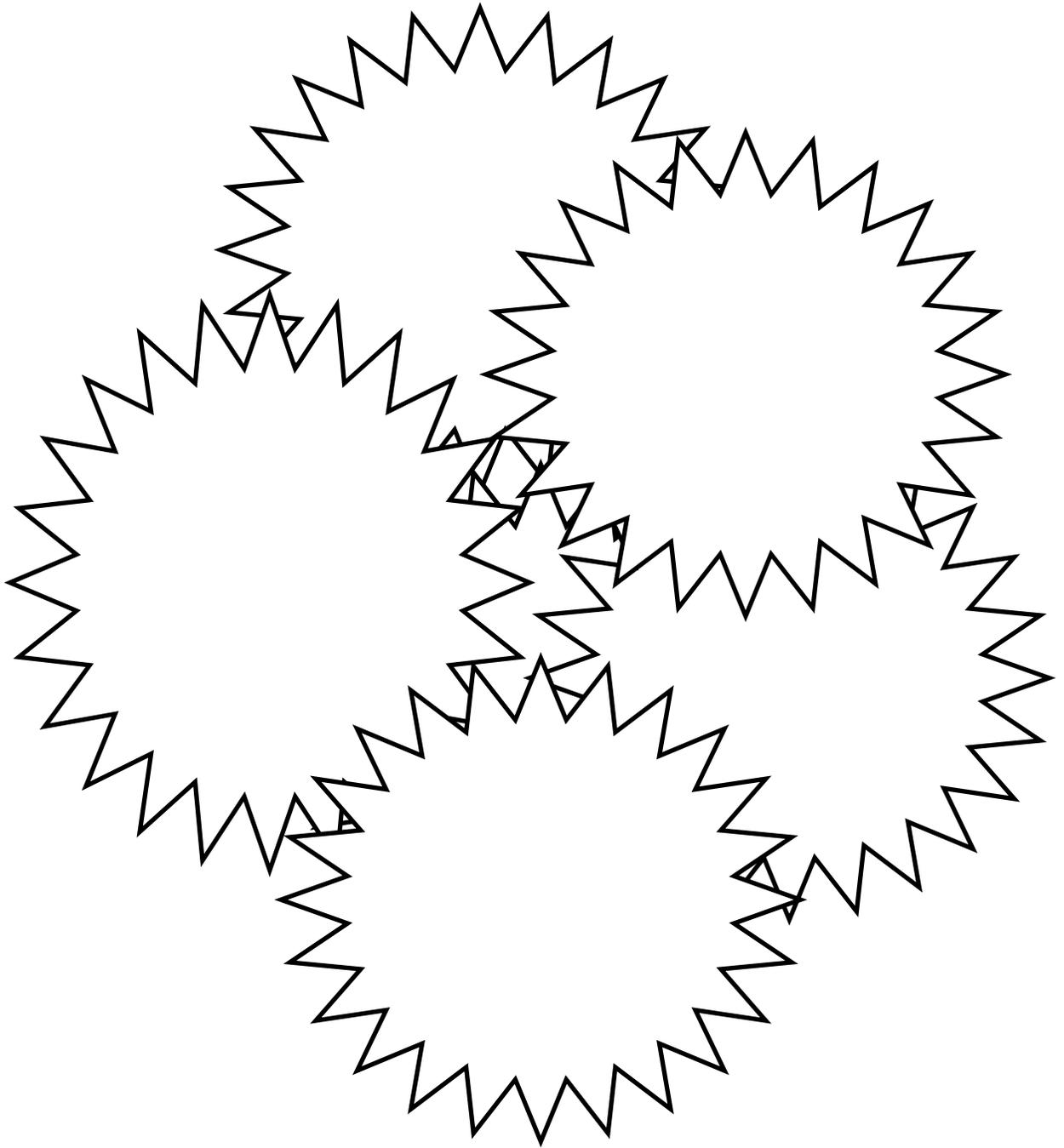
<b>Observation Record</b>			
<p><b>Observer:</b> Asma Dahbour</p> <p>School:-----</p> <p>Name of Student:-----</p> <p>Time:-----</p> <p>Date:-----</p>			
<b>Student's behaviour</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>
Finished his/her work completely			
Stay on task, and show accuracy			
Listens patiently at circle time			
Respecting turns cooperatively			
Applies many trials to figure out action work creatively			



Appendix C

Name:.....

Color each star with a different color



Appendix D

