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Rest and Independence in the Daytime Nap

Maisah S. Outlaw
St. Catherine University

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Maisah Outlaw

St. Catherine University

St. Paul, Minnesota

Project Coach _____ Date _____

Abstract

The purpose of this study was to determine the effects that daily diffusion of lavender oil and adult led breathing exercises would have on the daytime nap in a Montessori early childhood classroom. Specifically, the study targeted the length of time needed for each child to fall asleep, in addition to independence in the children themselves. There were 14 participants, ages 3 to 5 years old, in an early childhood Montessori classroom. The researcher diffused lavender essential oil each day during the nap period, and led the participants in one-minute breathing exercises at the beginning of nap. The researcher collected data by recording the time that each child fell asleep, tallying the number of children requiring adult contact, recording any actions observed by children before falling asleep, and reflecting in a journal. The study revealed that children did become more independent over the course of the intervention, but sleep latency did not decline consistently. The data suggests that further research into effective techniques for reducing sleep latency is needed in the early childhood field.

Keywords: nap, rest, sleep, independence, Montessori

Sleep hygiene, or good sleeping habits, is an important part of optimal human existence. Cultivating proper sleep hygiene begins in childhood. While children require much rest, it is not always monophasic. This means that a child does not get all the rest that they need in one sleeping session. By allowing for this, the daytime nap has become a staple in childhood development. By giving a child another opportunity to rest during the day, one can make up a deficiency in sleep. When done properly, the daytime nap can contribute to sleep hygiene. In general, rest in children does not come without challenges. Even in appropriately dark and calm spaces, many children still require the assistance of an adult in both the daytime nap, and nighttime sleep. This contrasts with a child's natural desire to gain independence. If one is to leave a child to their own will, the child may only sleep when completely exhausted. Even after a child can become somewhat independent in resting, sleep latency, or the duration of time that it takes for one to fall asleep, may bring up issues of time. Alternatively, constant contact with a child around and during rest times could lead to dependency. The goal should be to maintain independence while keeping sleep latency low. Other sleep aids, be they tangible or ritualistic must be present in the resting practice.

A daytime nap at home may be problematic enough. Asking a child to rest in a large group of other children in a school setting usually compounds problems. Nap time looks different in almost every school setting. In Montessori classrooms nap requires even more forward planning, as children in one classroom are mixed-age. The average age range of children in a Montessori early childhood classroom is 3 to 6. At around 5 children tend to shift to the monophasic sleep schedule that persists into adulthood. This means that in any Montessori classroom there will be children who rest, and children who do not.

The model of Montessori that has prevailed in the United States has allowed for nap to at least be separate from the classroom. The nap room is used to provide a dark, quiet space. Rooms such as this help to mitigate some of the factors that can make nap time difficult. In Montessori, however, this practice has been criticized for breaking up the community of children, which all teachers are working hard to cultivate. What can come from this separation is a hierarchical attitude from the older children, and a resentfulness from the children who rest. On more than one occasion I have heard an older child tell a child that rests that they are not able to do something because the child is a “napper”. It has been observed across many schools that children try to force themselves to stay awake so that they can be phased out of nap. This desire to belong to the monophasic group of children can be detrimental to overall sleep hygiene. The burgeoning structure of Montessori is an all-day approach. This provides the child with the opportunity to remain in one classroom throughout the entire day, including nap time. This is mostly positive, as it supports community building and cuts down on transitions from room to room. However, if older children are not able to be quiet and mindful of sleeping children, and proper attention is not paid to the amount of light in the nap area of the classroom, the children’s sleep will be affected as well. There needs to be a way that Montessori principals of social cohesion and community are protected, while still providing for the sleep needs of the growing child.

There has been much research on sleep in children, but specific research on methods of increasing independence and reducing sleep latency is lacking. In my school, we work within the Montessori All-Day structure, meaning the children nap in the environment. My room consists of 27 children aged between 2 ½ and 6, 14 of whom nap. Our schedule is such that the children are asked to begin nap while the room is still being cleaned up from lunch by the older children. The

process of cleaning is always filled with noise from the older children. My room has also decided to place the napping children in an area of the environment that least interrupts the older children's ability to access higher level materials in the afternoon work cycle, or uninterrupted period of working time. Unfortunately, the area of the environment that provides the least disruption to that is also the sunniest part of the space. The result is essentially a loud, bright resting area, which is the opposite of what a person requires of their sleeping conditions. Eventually the older children finish cleaning up, and go outside. After they leave there are only roughly 20 minutes of silence in which the napping children can hope to fall asleep.

Attempting to have children rest under these circumstances is challenging. It requires constant attention from an adult, and sleep latency is severe in the most sensitive children. I began to ask myself how the adults in the classroom can support independence in the napping child, while simultaneously reducing sleep latency. This question led to the implementation of an intervention that included two techniques that introduced relatively small change to the children's schedule. Ultimately, the question that arose in my research was "What effect will the use of breathing techniques and diffusion of lavender essential oil in the Children's House resting area have on decreasing sleep latency and adult dependence in napping children?

Review of Literature

This literature review focuses on topics that pertain to the function of nap in the young child's life, and some methods that have led to better sleep, or increased relaxation. Many things were revealed during research of the topics. When choosing articles to include, methods that could be used to decrease adult dependency and sleep latency were sought. What was found was much evidence to suggest that both the physical body, and the mind, can be properly prepared for rest. The diffusion of essential oils is an intervention that could have immense benefits without

disrupting the routine around nap which has already been built. While more disruptive, activities in mindfulness may be able to bring change the collective energy of the napping group of children, allowing for a more productive resting time. The literature reviewed supports the use of diffused lavender oil and breathing exercises to decrease sleep latency.

In an article written to more fully understand the purpose of the nap in schools in Japan, Fukuda and Sakashita (2002) designed a questionnaire for caregivers to provide information related to their child's sleep. This data collection tool contained some questions that were considered subjective, as they pertained to the characteristics of the child at various time of the waking hours. The focus of this research was to gain information about the sleeping patterns of kindergarten children. The results of the questionnaire ultimately showed that the function of the nap for kindergarten aged children had more to do with maintaining the routine and circadian rhythm of younger children than it did with the need for children to take a nap to make up for sleep lost at night. This is important to this action research because it takes emphasis from the duration of the child's nap, and allows for the pursuit of an independent napping process. This study shows that nap is important for the regulation and development of young children, as it highlights the role of routine and order in the child's life. By napping independently each day, the child will internalize the routine of midday rest. This will hopefully lead to decreases sleep latency.

Duclos, Kurdziel, and Spencer (2013) wanted to show that preschool-aged children were better able to recall things after a nap. The authors claimed that "when short-term memory stores are limited, memory consolidation must take place frequently" (Duclos, Kurdziel, & Spencer, 2013 p. 17267). They felt that because early childhood is marked by spikes in knowledge acquisition that the brain needs to be able to make space for knowledge. While the

child who naps tends to sleep less at night, the biphasic sleep model is the way that most children get the sleep that they need (Duclos et al., 2013). In seeking to prove this, they set up experiments that were akin to the memory game. Children were assessed in the morning, after nap or wake time, and then again, the next day.

What Duclos et al. (2013) found was that children essentially performed the same in the initial assessment, which was essentially a memory matching exercise. Children who napped, however, had better recall after their rest than children who did not rest at all. Duclos et al. (2013) also concluded that children who napped scored better on the final assessment the following morning. This supports their claim that nap produces long-term benefits.

Possible strategies to be used for the decrease of sleep latency among the napping group of children include diffusion of essential oils, and a consistent breathing technique used to induce relaxation. In one article, Patricia O'Malley provided a variety of results from studies using essential oil inhalation in subjects that were preparing to sleep. Although O'Malley (2017) confessed that precise studies are limited, she could find enough research to support her claim. O'Malley references a study in which subjects agreed to wear a patch with lavender oil. The subjects did not get more hours of sleep, but they did record that the quality of sleep was better. This could be due to the lavender oil "binding specific neuronal receptors" (O'Malley, 2017 p.74), which means that they connect certain receptors in the brain. This helps sleep quality of sleep because the receptors are located in an area of the brain that is responsible for sleep. What is gained from this article is that lavender oil may have chemical effects on the brain. In an article about lavender and its effects on the nervous system, Ghadiri, Gorji, and Koulivand (2013) support O'Malley by discussing specific areas of the brain that are said to be affected by lavender. One of the areas discussed is located right next to the area of the brain that is

responsible for sleep. They also revealed that the effects of lavender are more pronounced in younger subjects. This shows that the strategy of using diffusing lavender essential oil is relevant to the group of napping children.

Hirokawa and Nishimoto brought to attention another facet that has been argued to play a role in experiments linking lavender oil to relaxation. They posit that there has been suggestion of "participant expectancy bias" (Hirokawa & Nishimoto, 2012 p. 112). This means that participants caused themselves to relax based on the information that they received about the effects of lavender oil. However, it still assisted in the subject's ability to fall asleep. To eliminate participant expectancy bias, information about the effects of lavender oil are not likely to be shared with the children themselves. Other oils were considered as well. Morita, Moritoki, Sano, Sei, and Seno (1998) did experiments with both rats and humans to measure the effects of cedar essence on sleep. What they found was that cedar essence decreased sleep latency in a large percent of the subjects, humans and rats alike. Furthermore, it decreased sleep latency at a time of day when it is often the highest, which is the afternoon.

Eichenseher (2016) supports the idea that yoga is linked to relaxation. This relaxation hopefully leads to sleep. Eichenseher (2016) writes about a variety of techniques to induce sleep, including mindfulness, essential oils, and yoga poses. One major part of yoga that can be used is breathing techniques. Shimo, Terai, and Umezawa (2014) led a study to measure the effect of slow breathing on the ability to manage stress. Perhaps this can translate to the child's ability to relax and rest independently.

Methodology

The problem in this research was informed by the observation that most children in my school environment experienced prolonged sleep latency, or duration of time spent transitioning

from being awake to being asleep. It had also been observed that many children additionally required some physical contact from adults to transition into rest successfully. There were many factors of the environment that may have contribute to these problems. However, the intervention had to be both feasible and practical for the needs of the environment.

In keeping with Montessori principles of providing the least amount of change for the fewest number of children, I sought to choose an intervention that would not be intrusive for all children. Through research and critical thought, I chose to use the intervention of diffused lavender essential oil coupled with a short deep breathing exercise at the beginning of nap. In preparation for the intervention I bought one electronic essential oil diffuser, and one bottle of lavender essential oil. No materials needed to be purchased for the breathing exercise.

I wanted every part of my research to be in keeping with the Montessori method. I especially wanted to be sure that every part of the data collection and intervention was in line with principles. One part of that is the preparation of children for change. Before bringing the oil diffuser into the environment I planned an introduction of the diffuser for all children, as the entire environment would be interacting with it in some way. I brought the diffuser to the children through a Grace and Courtesy lesson. Grace and Courtesy lessons are dramas or skits that provide information and guidelines for expected behaviors. In the Grace and Courtesy lesson, I explained what the object was, and what it’s purpose in the environment would be. I then informed the children that it was for an adult to touch. I also showed an appropriate way in which the children could smell the vapor while standing next to the diffuser. I believed that introducing the diffuser in this way would best acclimate the children to the coming change.

To set up the oil diffusion portion of the intervention I stored the diffuser in a cupboard only accessible to adults in the environment. Since the children began nap directly after lunch,

the daily set-up of the diffuser had to take place around lunch. Each day, while children set up their lunch spaces, I plugged the diffuser in and placed it on a non-changing, predetermined shelf. Then, at the beginning of the lunch clean-up process—which was about 25 minutes before the first children went to their cots for nap—I filled the diffuser with water, poured 10 drops of lavender essential oil into the water, and started the diffuser on the highest intensity setting.

I created four varied data collection tools. While I created them, I took care to think of data that would show whether independence in nap increased, and sleep latency decreased during the intervention. Three of the tools were used during the nap process, while the fourth was meant to be for a reflective period 30 minutes to one hour after nap time. The first data collection tool was titled Resting Time (See Appendix A). This data collection tool was used to record the time that each child went to sleep, and the time that they awoke. The table had three columns. One column was for child numbers, which were used as signifiers to protect confidentiality. Another column was for time asleep, and one remained for waking time. There was one row for each child. During the intervention, I was sure to wear a watch each day, even though there was a clock on the wall in the resting area. I wanted to make sure to get the most precise times reliably over the course of data collection.

I created a second Data Collection tool entitled Observed Pre-resting actions (See Appendix B). The tool consisted of a key with a list of actions such as scratching cot, and curling up on the cot. I chose the actions after observing which actions were most prevalent over the course of the year. There was also a table with a column to list each child with a number in the same way as the Resting Time data tool. This tool helped give insight into both the independence and sleep latency components of the research. The hope was that pre-resting actions in general would decrease because of children getting to sleep earlier. If the children fell asleep sooner,

decreasing sleep latency, there would naturally be a dip in the actions. Similarly, the lessening of observed pre-resting actions throughout the intervention translated to less time that I needed to spend soothing children and helping them to settle down for rest.

The third data collection tool was a Journal of Reflections (See Appendix D). This tool included two prompts to be reflected on. The first was an observational assessment of the level of independence each day. A scale of 1-10 was used, with room to discuss or explain. The second prompt was to discuss how many children needed assistance in getting to sleep, and which methods were used. The reflective journal was the only data tool not used during the nap time itself. The final data tool used was a tally of children requiring physical contact (See Appendix C). This physical contact included things such as back rubbing, hand holding, and gentle rocking while the child lay in the cot. This tool was created to show concretely any changes in independence among the resting children.

Before beginning to collect data, I printed each data collection tool and made copies that would correspond to the amount of days that I would be collecting data. In this process, I was sure to account for days when school would be closed. I placed all data collection tool copies in a binder, to be locked in a closet when not used. None of the data collection tools included the names or initials of children in the study. Instead, numbers were assigned that corresponded to a key kept in the closet.

After the children who were to nap had done their part in the lunch clean-up process, they put their chairs away and came to their cots. Once all children were laying down on their cots I led them in a one minute breathing exercise. In this exercise, the children inhaled through their noses for four seconds, held the breath for four seconds, and exhaled through their mouths for eight seconds. I led the children through this sequence three times before saying, “happy rest”

and beginning the nap period. At this point I prioritized which children appeared to need the most support based on the Pre-resting Observed Actions data tool. While providing relevant attention to children needing support I continued to track pre-resting actions and resting times of each child. To ensure that children were fully asleep, I waited 2 full minutes after first noticing each child was asleep to record resting time. Unless otherwise required, I stayed with each child that I was supporting until they transitioned to sleeping. I continued this process of supporting children and recording data for 45 minutes. After 45 minutes, I joined the older children in their second work cycle while continuing to monitor when children awoke.

Once all children were awake from nap, I went on my break. During this time, I allowed the diffuser to remain on. While on my break, I filled out the Journal of Reflections data tool. At the end of each day I cleaned out the diffuser and stored it in a cupboard.

Data Analysis

Pre-intervention data

Using my data tools, I collected one week of pre-intervention data. This was a short week at my school, four days in total. Children arrived at their cots at 12:35 pm. After laying down their blankets, children were expected to lie on their cots immediately. All told, every child present was lying on their cot by 12:40 pm. The breathing exercise that would take place during the intervention would take approximately 1 minute, meaning that each child could theoretically be asleep by 12:41 pm. I decided to use that same metric for calculating sleep latency during the week of baseline data collection. Of course, children would not be forced to stay awake for the breathing exercise. However, all present children were still awake by the time the breathing exercise would have taken place in the baseline data collection week. After 30 minutes on their

cot, children were informed that they could either choose work or remain on their cot for further rest.

After the time that the breathing exercise concluded, I began to use the Resting Time collection tool to record the times that children fell asleep. On the first day of collection the least time of sleep latency was 11 minutes, while the child who stayed awake the longest had sleep latency of 34 minutes. Of the eight children who slept, the average sleep latency for the day was 22 minutes. Two children were absent on this day, while four children did not sleep at all. On the second day of collection the least time of sleep latency was 12 minutes, while the child who stayed awake the longest had sleep latency of 58 minutes. Of the nine children who slept, the average sleep latency for the day was 33 minutes. More than half of the children experienced sleep latency of more than 30 minutes. Five children were absent on this day, while all that were present napped. The least time of sleep latency was 20 minutes, while the child who stayed awake the longest experienced sleep latency of 68 minutes. Of the eight children who slept, the average sleep latency was 46 minutes. Four children were absent on this day, while two did not sleep. Only one child had sleep latency of less than 30 minutes. On the fourth and final day of baseline data collection the least time of sleep latency was 11 minutes, while the child who was awake the longest had sleep latency of 45 minutes. Of the seven children who napped, the average sleep latency was 26 minutes. On this day, three children were absent, while four children did not sleep. Only one child had sleep latency of more than 30 minutes. The average sleep latency for this week of pre-intervention data collection was 31 minutes.

I also recorded data regarding the actions that I observed from various children as they readied themselves for nap. On each day there was a variety of pre-resting actions observed. On the first day, three children were observed scratching their cots for under one minute each.

Shortly after their scratching stopped, each of the children fell asleep. Three children were observed pulling their blankets over their head. Of those three children, only two went on to fall asleep. The other child began to be restless on their cot, and required my assistance in lying still. The remaining two children had no pre-resting observed actions. On the second day, one child was observed quietly rocking on their cot until falling asleep. Two children were observed pulling their blankets over their heads. One fell asleep within five minutes of this action, while one did not sleep at all. On the third day, all children who rested simply laid on the cot until falling asleep, except one. One child was observed covering their head with their blanket until falling asleep. On the fourth day two children were observed bouncing on their cot. Though I assisted them in lying on their cot, neither of those children slept. One child was observed covering their head until falling asleep. Another child was observed bouncing the middle of their body on their cot until falling asleep. The remaining children displayed no pre-resting actions.

In my reflective journal, I rated the overall independence of the nap process at 5 or below each day of the week of baseline data collection. This was largely because I had to assist many children initially settling down for nap in addition to providing physical contact to aid in sleep. During this week, I used only back rubbing as a way of providing aid. On the first day 8 children required physical contact, either in initially settling or falling asleep. On the second day 8 children required physical contact. On the third day 6 children required physical contact, and on the final day 5 children required physical contact. Throughout the year I have been the sole person responsible for children during nap time, and I continued with the same structure throughout the action research.

Intervention data: Resting time

I collected five weeks of data. Of these five weeks only the last two were full school weeks. The other weeks include at least one missing day as school was closed. The schedule for children coming to their cots and engaging in the breathing exercise remained constant. On the first day of the first week of intervention data collection the least amount of sleep latency was 3 minutes, while the most was 22 minutes. Eight children rested on this day while two were absent, and four did not rest at all. The average sleep latency was 17 minutes. On the second day of this four-day week the least amount of sleep latency was 5 minutes, while the most was 27. Nine of the children rested on this day with an average sleep latency of 21 minutes. Three children were absent, and two did not rest. On the third day of the first week ten of the children rested, although half of them experienced sleep latency of 30 minutes or more. The least amount of sleep latency was 9 minutes, while the most was 55 minutes. The resulting average sleep latency for this day was 27 minutes. On the last day of this week, three children were absent and three others did not rest. Of the 8 children who rested, the least sleep latency was 6 minutes. The most sleep latency was 45 minutes. The average sleep latency was 19 minutes, with only one child having sleep latency of 30 minutes or more. The average sleep latency for the first week of intervention data collection was 21 minutes.

The second week of intervention data collection was also a four day week. On the first day the least amount of sleep latency was 4 minutes, while the most was 39 minutes. On this day 10 children rested. There were no children absent, and four children did not sleep. The average sleep latency on this day was 18 minutes. This was the first day back after a three day weekend. On Tuesday, many of the children did not rest. Five children stayed awake, while one child was absent. Of the 8 children who rested the least amount of sleep latency was 9 minutes, while the most was 34 minutes. The average sleep latency was 18 minutes. Over half of the resting

children experienced sleep latency of 20 minutes or less. On the third day the least amount of sleep latency was 13 minutes, while the most was 35 minutes. The average sleep latency on this day was 25 minutes. Two children were absent, while another five did not rest, leaving a total of 7 children resting. On the fourth and final day of this week one child was absent, while four children did not rest. Of the children who rested, the recorded times were unusual. The least amount of sleep latency was -21 minutes. The child went to rest before the breathing exercise, but after the diffusion of oils had begun. On the opposite end, the child with the most sleep latency was awake for 61 minutes. The average sleep latency on this day was 20 minutes. The average sleep latency for the second week of intervention data collection was 20 minutes, which was one minute less than the first week.

The third week of data collection was a three-day school week. The school was closed on Thursday and Friday of this week. On the first day of this week 2 children were absent, while three children did not rest. Of the nine children who rested the least sleep latency was 4 minutes. The most sleep latency was 21 minutes. The average sleep latency for this day was 12 minutes. This was the lowest average yet recorded, and the first day that all children were asleep in under 30 minutes. On the second day, five children were absent. Three children did not rest, leaving only six children who did sleep. Of those children the least sleep latency was 1 minute, while the most was 21 minutes. The average sleep latency on this day was 11 minutes. Of the children who rested, all but one experienced sleep latency of 15 minutes or less. On the final day of this week the average sleep latency time of 28 minutes was more than twice the lowest daily average of the week, which was 11 minutes. Of the ten children who rested on this day the lowest sleep latency was 3 minutes, while the most sleep latency was 55 minutes. Half of the children experienced sleep latency of 30 minutes or more. One child was absent, while another three children did not

rest. Even with the high sleep latency average on the last day of the week, the overall average for the week was 17 minutes, which was still lower than all previous weeks.

The fourth week of intervention data collection was the first full school week of all data collection. The first day of the week was the first day of in school nap for the children after a four-day weekend. Two children were absent, while another three did not rest. The child with the lowest sleep latency went to sleep 3 minutes before the breathing exercise. The highest amount of sleep latency was 40 minutes, which was far from the average. Of the nine children who rested, the average sleep latency was 16 minutes. On the second day of the week only half of the children rested. Five children were absent. The lowest sleep latency was 3 minutes before the breathing exercise. This happened on the previous day, but not with the same child. the most sleep latency was 35 minutes. The average sleep latency on this day was 14 minutes. The first and second days of this week were the only days that resulted in average sleep latency of less than 20 minutes.

On the third day of the week the lowest sleep latency was 7 minutes, while the most was 48 minutes. Only half of the children rested, as on the previous day. Three children were absent, and four did not rest. Of the children who rested, the average sleep latency was 26 minutes. On this day, more than half of the resting children experienced sleep latency of more than 25 minutes. On the fourth day of the week one of the children fell asleep during breathing exercises, making the lowest sleep latency 0 minutes. The most sleep latency was 53 minutes. Of the eight children who rested, the average sleep latency was 23 minutes. A total of 6 children did not rest, four of which were absent. Aside from the child who fell asleep during the breathing exercise, all children experienced sleep latency of more than 15 minutes. On the last day of this week five children were absent, while two others did not rest. The lowest sleep latency was 9 minutes. This

time was shared by two children. The most sleep latency was 29 minutes. Of the seven children who rested, the average sleep latency was 20 minutes. The average sleep latency for this week was 19 minutes, which was 2 minutes more than the previous week.

The final week of intervention data collection was another full school week. On the first day of this week one child was absent. There was an emergency during the nap period which caused all children to be awakened. The fire emergency bell began ringing at 1:19pm. At that time, 9 children were asleep. Of the rest time that we had the least sleep latency was 0 minutes, while the most was 31 minutes. The average sleep latency of the nine resting children was 16 minutes. The second day of the week, the day after the emergency during nap, yielded interesting results. My prediction was that children would have a harder time falling asleep. The least sleep latency was 18 minutes, while the most was 69 minutes. Of the 8 children who rested, the average sleep latency was 45 minutes. These are all the highest numbers recorded throughout the study thus far. My prediction that the emergency of the day before would have residual effects on the sleep children proved to be correct. Additionally, three children were absent, while three did not rest.

The third day of the week showed more of a return to expected numbers. While six children were absent, the most absences in the study, the average sleep latency was 21 minutes. On this day 6 children rested, and two other present children did not. The lowest sleep latency was 8 minutes, while the most was 40 minutes. On the fourth day of the week the lowest sleep latency was 15 minutes. The highest sleep latency was 52 minutes. Of the seven children who rested, the average sleep latency was 29 minutes. Two children were absent, while another five children did not rest on this day. The final day of data collection came with five absent children and one child who did not rest. Of the eight children who did rest the lowest sleep latency was 7

minutes. The highest sleep latency was 38 minutes, shared by two children. The average sleep latency on the final day of data collection was 19 minutes. The average sleep latency for the final week of data collection was 26 minutes. This is the highest weekly average of all the intervention data collection weeks.

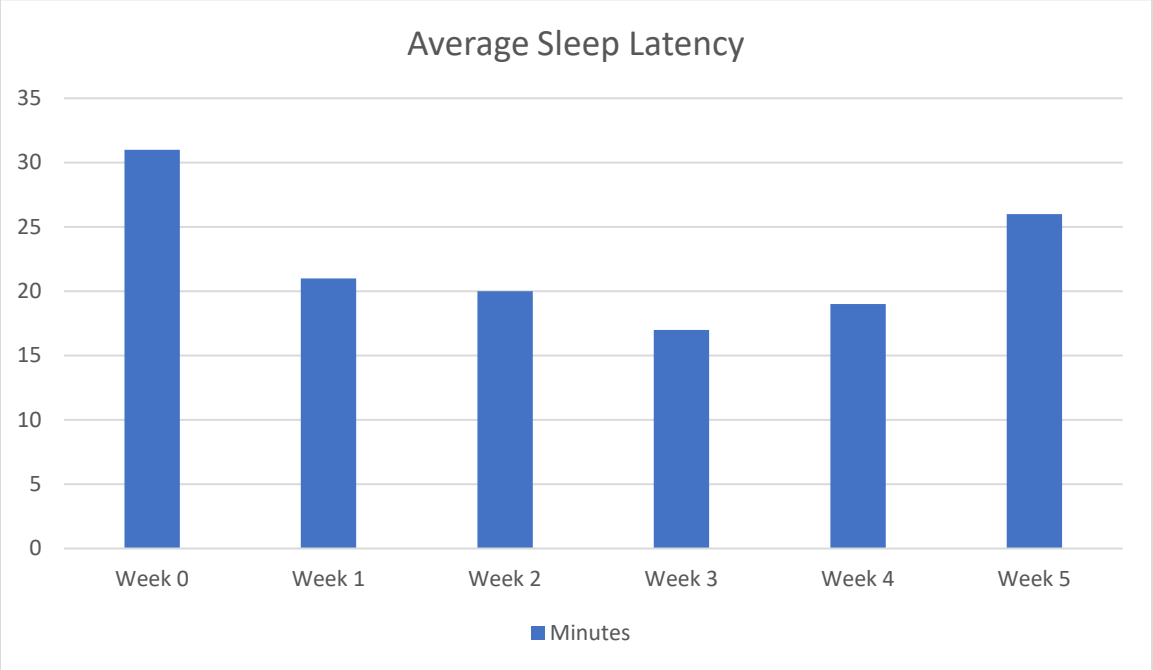

Figure 1: Student sleep latency

Conclusions

While all weeks of intervention data collection showed sleep latency averages less than those of the pre-intervention week, results were inconclusive. During the first three weeks, the average weekly sleep latency numbers decreased with each week. Then, in the fourth and fifth weeks the averages increased. It is hard to say definitively that the emergency evacuation on the first day of the final week is the cause of the higher averages on following days. Similarly to the average sleep latency, the percentage of children falling asleep within 30 minutes increased overall, though not at a steady pace.

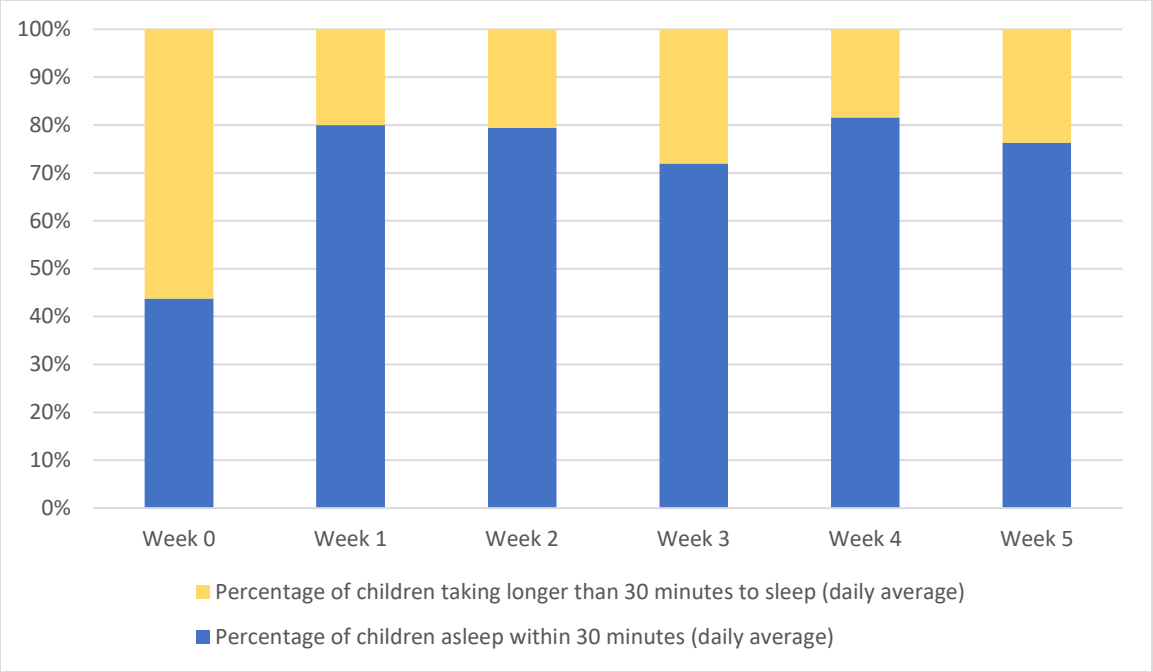

Figure 2: Student sleep latency by percentage

The pre-resting observed actions tended to not have any correlation with sleep or sleep time. The actual measured independence of the napping process, which was the tally of children requiring physical contact, did increase consistently over all the intervention weeks. The number of children requiring physical contact decreased incrementally throughout the intervention.

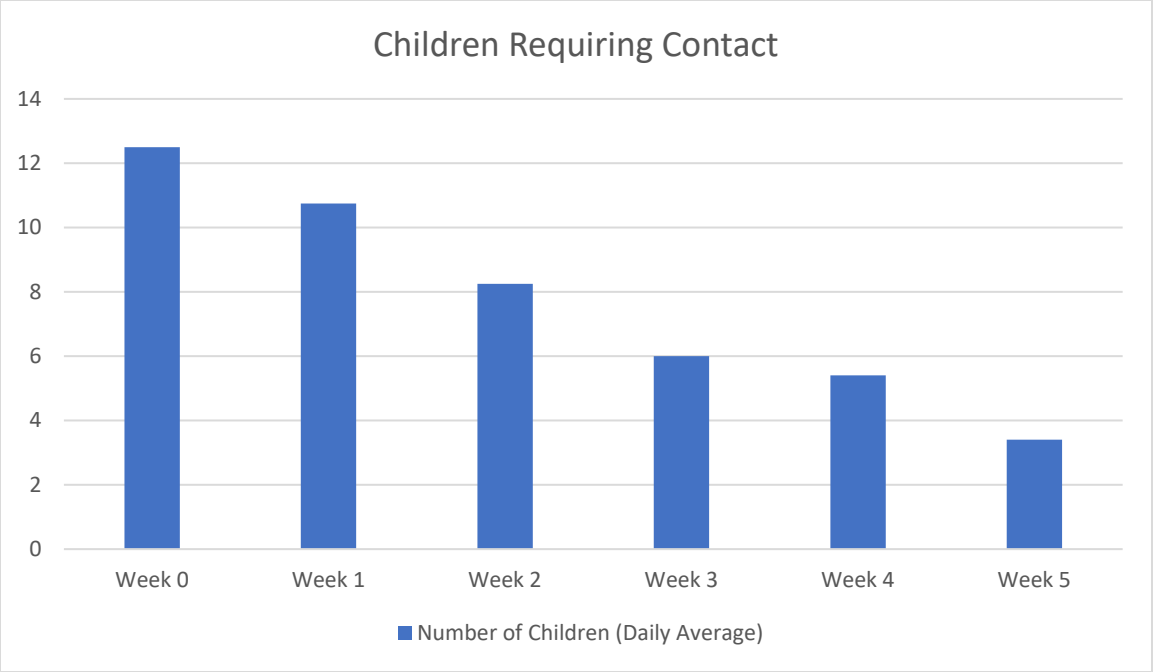

Figure 3: Student physical contact tally

This increase in independence coincides with my reflections over the weeks. Aside from the emergency evacuation and the days that followed, my feelings toward the nap process were becoming progressively positive.

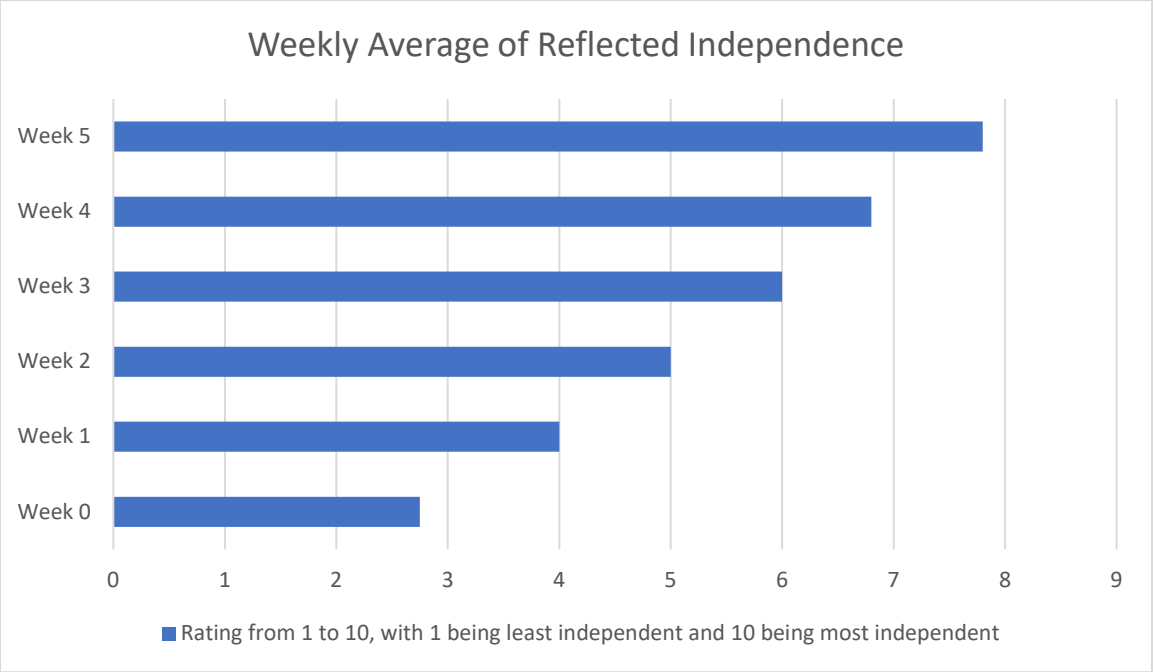

Figure 4: Researcher independence rating

Action Plan

The research of sleep latency in children engaging in daytime nap in a setting shared with other non-resting children has much opportunity for growth. During initial surveying of information for the literature review, there were limited sources of prior research. Considering this, the contribution of this research to the larger topic is beneficial. Although this investigation may be inconclusive regarding reduction of sleep latency, it can be said that it contributes to existing theories of child development as the reduction of pre-resting observed actions over the course of the intervention suggests the benefit of predictability in children's routines. The routine of starting the oil diffuser and engaging in breathing exercise did strengthen the predictability of nap time as discussed in the data analysis section. While sleep latency may not have been reduced in significant ways throughout the napping group, the children have come to rely on this new system of nap.

As teachers, especially in Montessori, we learn that children thrive in ordered environments. Being able to provide the children with a predictable system in the middle of a time that is ordinarily filled with unforeseeable events allowed the children who were napping to internalize some order. Before the research, there was no fixed action that signaled the beginning of nap. Children would set up their blanket, and I would go to individuals needing the most assistance to help them settle. With the intervention, I have provided some security to the children who nap. This fixed system could be improved in a way that would more likely reduce sleep latency in a quantifiable way. As it were, the children have been impacted in a way that allows them to calm themselves in an otherwise potentially chaotic time. On the Monday after finishing data collection I was unsure of whether I wanted to continue the breathing exercise.

After I sat down in the nap area, one child asked specifically for the breathing that we had all done as a group. I obliged, and have continued to lead the breathing exercise every day. From this I can infer that at least some of the children have internalized that the breathing exercise is the start of nap.

The children were not the only impacted party. The adults in the environment have also been affected by the intervention. The nap process happens during the time that two of the adults in the environment take their break. One adult remarked that upon reentering the environment after her 30-minute break that the lavender oil provided a calming effect as she entered the room. This could mean that the effects of lavender oil are pronounced upon entering a space. The diffuser was quite unobtrusive, and could easily be integrated into the classroom at other times of the day.

As mentioned, I believe that this study could be a catalyst for further research on the topic. There were some conditions that could be altered to change results in future research. One potential topic for future study is the effect of essential oils and breathing exercises on the efficacy of the adults in the classroom. This can either be focused on nap time, or throughout the day. Nap time might be easier to do, as it provides a natural setting for calming and mindful practices. Another study could involve the same intervention that was used in this research applied to the children who are involved in the clean-up routine after lunch instead of napping. This would contribute more to the topic of self-regulation than nap transition and sleep.

Regarding conditions that could have altered results in future research, there were a few variables that may have affected results of this study. The first variable is that the napping children did not have their own separate room in which to nap. Aside from the obvious challenges posed, this meant that the beginning of nap was subject to the fluctuations in the

group of children cleaning up lunch. These fluctuations came not only from the time that it took the children to leave the environment after cleaning, but were also found in the general noise and energy level in the room. On a day when the cleaning process was least invasive to the napping time, the children and adults involved in cleaning were quiet and swift. For instance, the earliest that the non-resting children left the environment was 12:50, only 9 minutes after the conclusion of the breathing exercise. On other days, when the group of children cleaning was less focused, the adults involved were forced to give more verbal reminders which led to an increase in the volume in the room. Another variable was presence of windows in the room. There were windows throughout the entire room, letting in a great deal of light. Unfortunately, there was no feasible way of blocking out light. On days that were rainy there was less light, while sunnier days had more.

This research has reinforced my knowledge of the importance of observation with children. While being mindful enough to observe the children and nap process so intently I have begun to feel much better about the napping process. While the sleep latency may show an inconclusive trend, I feel that the intervention was successful in establishing a routine of calm relaxation in the environment that the children can be successful with. Through my reflective journals, I have come to view the nap process as overall more independent. While some children still require assistance in initially settling into the resting time, the amount of physical interactions that I have with the children has decreased. I feel more positive about the napping process now than before. I have seen that it can be a peaceful time. The establishment of a routine that is consistent and calm should have positive results on the flow and success of nap time.

The results of the research will change my practice beyond napping time. I have a renewed confidence in the power of observation, and how our attitudes as adults affect our environments. I will go forward and continue to create strong, well thought systems that children can internalize. After this research, my practicing and execution of nap time has become clearer. When there is a time that I am no longer in charge of nap, this work should serve as a tool for cultivating a peaceful napping environment.

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Appendix A

Resting Time

Date:

Child's Number	Time of Sleep	Time of Waking
Child 1		
Child 2		
Child 3		
Child 4		
Child 5		
Child 6		
Child 7		
Child 8		
Child 9		
Child 10		
Child 11		
Child 12		
Child 13		
Child 14		

***For purposes of confidentiality, no names of children have been used on this Data Tool form. I have in my possession a key which connects each resting child's name to a number.**

Appendix B

Observed Pre-resting Actions

Date:

Key:
Scratching cot—SC
Kicking feet—K
Talking—T
Singing—S
Wriggling on cot—W
Other (to be described)—O

Child's Number	Observed Actions
Child 1	
Child 2	
Child 3	
Child 4	
Child 5	
Child 6	
Child 7	
Child 8	
Child 9	
Child 10	
Child 11	
Child 12	
Child 13	
Child 14	

***For purposes of confidentiality, no names of children have been used on this Data Tool form. I have in my possession a key which connects each resting child's name to a number.**

Appendix C

Tally of children requiring physical contact

Date	Number of Children

Appendix D

Journal of Reflections

Date:

- **On a scale of 1-10, how independent was the overall process during the napping cycle? Discuss. (1-3: Not Independent, 4-7: Somewhat Independent, 8-10: Very Independent)**

- **How many children did you aid in falling asleep? What methods were used?**