The Assessment of the Effects of Structured and Non-Structured Art Projects on Children's Creativity Before and After Project Completion

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2 May 2012

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Acknowledgements

I would like to thank Professor Ozorak for her constant support, positivity, and patience throughout this new process. Her guidance in finding such a wonderful body of participants at The Creating Landscapes Learning Center was much appreciated! I was able to complete a project that I was truly passionate in exploring. I would also like to thank Professor Knupsky for providing me with support, encouragement and helpful information on the cognition of creativity, it was very much appreciated. Thank you both for listening to all the countless times I would reference the Newsweek article! I could not have done this project without either of you.

Of course, I could not have completed this project without the cooperation of Dana Yeager and her fellow teachers and students at The Creating Landscapes Learning Center. The students were an absolute pleasure to work with and made this process very enjoyable and fulfilling. I cannot thank them enough for taking the time out of their school day to help me complete my project.

I would also like to thank Caroline DiPerna, my fellow comping researcher, for her wonderful support and friendship as we worked with the students together. She also made this an enjoyable and fun process as we worked with the students and their art projects. I am so lucky to have been able to “team up” with such a positive friend.

I’d also like to thank my friends who were the most supportive friends I could ask for as we all went through the experience of comping this year. Thank you to Aubrey Murano, Julia Kling, Kate Cragg, and Adrienne Tulet, Ashley Adamson, and Eliza Nelson for providing endless encouragement and help when needed! And to all of my Walker Annex friends who have become like family to me, your endless support no matter what time of day or night has been invaluable during all these years!

Last but certainly not least, I’d like to thank my family for constantly providing support, love, and positive encouragement throughout this year and all my years at Allegheny. Mom, Dad, Edward, and Mary, I couldn’t have gotten through this new and challenging experience without you! Thank you for always believing I can achieve my goals!

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Abstract

Creativity, a broad term that includes the art of problem solving by using divergent thinking to come up with original and useful ideas, has constantly been a huge source of human innovation (Sternberg 2009, Guilford 1959). Are there some environmental experiences that can stimulate or inhibit a child's creative development? To answer these questions, structured and non-structured art projects were used to simulate structured and non-structured learning environments in children ages 5-7. Divergent thinking was assessed using open-ended questions to examine each child's creativity before and after each of the four art projects on four separate days. Assessments were based on Guildford's Alternative Use's Task (1965). Results found that that the class mean average creativity scores improved after the unstructured art projects and decreased after the structured art projects, however there was a stronger relationship between the day of assessment and class average creativity scores. The class average creativity scores decreased each day.

The Assessment of the Effects of Structured and Non-Structured Art Projects on Children's Creativity Before and After Project Completion

Creativity is something that people tend to value as a trait that may indicate a person's ability to solve problems and therefore help in moving society forward (Langer, 1989) and it is becoming a focus of popular culture today. However, popular culture is questioning if educators and learning environments are effectively fostering creativity. For example in 2010, *Newsweek* featured an article which discussed a creativity crisis in American elementary schools (Bronson and Merryman 2010). The article explained that Kyung Hee Kim, professor at the College of William and Mary had completed a study of 300,000 children and adults and concluded that there was a sudden and significant decline in the creativity of children in elementary schools across America today. Blame was placed on "standardized curriculum, rote memorization, and nationalized testing" as the general cause for harming creativity. This is not the first examination of creativity though. Past creativity experts and research have indicated the importance of examining the development of creativity (Runco, 2007).

Creativity began to gain attention when in, 1949 J.P. Guilford was elected president of the American Psychological Association. With him, creativity began to become a topic of popular research within the field of psychology. Guilford encourraged more research in the study of creativity (Runco, 2007) and argued that it was a "natural resource and suggested that efforts to encourage creativity would pay high dividends to the whole of society" (Runco, 2007).

Guildford is by no means the only expert to express the importance of creativity exploration. Sternberg also suggests that it is of great importance and that it is one of the 3 main

attitudes a leader must possess (Sternberg 2009). In order to create progress and perpetuate problem-solving skills, which creativity is often associated with, then creativity must be encouraged (Langer, 1989). Guilford also addresses the importance of harnessing creativity for the improvement of society in explaining that "if by any approach we could lift the population's problem solving skills by a small amount on the average, the summative effect would be incalculable" (Guilford, 1975). Why do these attempts for the improvement and encouragement in developing and researching creativity need to be made? Some research indicates that too much structure can negatively impact a child's mood and creativity (Carr et al., 2003). This study found that creativity and mood was higher and better when children were involved in unstructured art projects as opposed to structured art projects. Perhaps structure and routine standardization are factors found in institutions today that are harming the development of creativity and mood? Langer (1989) believes that "we should avoid relying on past routines and the categories of experience used in our personal pasts. We should instead look closely at new experiences and create new categories for those new experiences." Is too much structure and standardization limiting the opportunity for children to foster their creativity?

What is Creativity?

To understand how creativity is possibily being tossed to the way-side by teaching methods and classroom structures, an understanding of what creativity is comprised of is necessary. One of the most well known creativity experts is E. P. Torrance. His longitudinal studies of children's TTCT (Torrance Test of Creative Thinking) scores as predictors of success and achievement later in life have demonstrated the reliability of his measurements (Torrance 1969, 1972a, 1972b). Torrance identified creativity to be based on divergent thinking. In

addition, he also incorporated movement, drawing, and speaking into his measurements of creativity. He further definined this by scoring his creativity tests on originality, fluency, and flexibilty, as well as figural and verbal creativity. These components are used by many other creativity experts such as Guilford (1959) and Wallach and Kogan (1965).

Guilford's creativity model is known as the *Structruce of Intellect Model* (1959) and is comprised of Cognition of Semantic Relations, Cognition of Semantic Systems, Cognition of Semantic Transformations, Cognition of Semantic Implications, Evaluations, and divergent thinking (Meeker, 1978). For the purposes of this study, the focus will be on divergent thinking. Guilford explains that divergent thinking is a significant factor in defining creativity as opposed to convergent thinking (Runoc, 2007). Convergent thinking is the ability to solve a problem with the correct response and divergent thinking being the ability to respond to an open-ended task with solutions that are both useful and original or unique (Runco, 2007). For example, when asked a question such as name uses for a brick and the answer is "to build a house", by Guilford's model this would be considered useful, yet not original. However, when answering with "tie it to a rope as an anchor for a canoe" this response could be interpreted as useful and original by Guilford's model.

Wallach and Kogan (1965) also agreed that creativity is strongly based on divergent thinking and they also considered the importance of a person's environment in relation to their creativity. In their book *Modes of Thinking in Young Children* (1965), they hypothesized that divergent thinking could be better stimulated in an open and unstructured learning environment and indeed found their hypothesis to be true. They, along with other creativity experts (Runco, 2007), believe creativity to be a separate process than IQ, GPA or other standardized academic scores. In their study, they compared IQ, GPA, and divergent thinking scores given to students in

open classrooms verses the traditional classroom. Their results found that GPA and IQ were not dependent on the openness of the classroom, but that creativity was much more prevelant in an open classroom setting.

Some have criticized the idea of divergent thinking. Interestingly Nathan Kogan criticized the concepts of divergent thinking being a separate idea from convergent thinking. He argues that they are really not all that different and not indicative of creativity. He stated that the use of fluency and divergent thinking was more so a reflection of the age of new ideas of Guilford's generation (Kogan 2008). He claimed however that because of the fact that these terms were created more by the cultural zeitgeist of their generation, the distinguishment of these terms as separate are irrelevant to creativity research today. However, when considering the idea that divergent thinking can be used as a predictor of later sucess he did agree (despite the discrepency between divergent and convergent thinking) that "the evidence is suggestive of the long-term consistency of divergent thinking from childhood into adolescence and beyond" (Kogan 2008). It is important to consider the weaknesses and strengths of the various models of creativity.

Measuring Creativity in Children

One of the more popular methods for studying creativity is the TTCT. Many variations of this exist and they all range from 10-45 minutes long. Most of them focus around figural (visual) and verbal (language) components of creativity. A variation of the TTCT called the TCAM (Thinking Creativity in Action and Movement) exists for children or others with limited verbal and drawing skills (Scholastic Testing Services, Inc.) This test focuses on fluency, originality and imagination and is only 10-30 minutes long. Each of the three components of creativity is combined to make each child's individual creativity score. While the TTCT is well known and

and been tested and re-tested (Torrance 1972a, Torrance 1972b), the TTCT is a long and extensive test for children and requires training to administer and score. An alternative assesment task that includes scoring based on fluency and originality was provided by Guilford (1967) and is not as long and extensive as the TTCT. This can be an appropriate alternative when working with young children and a limited amount of time.

In Guilfrod's Alternative Use's Task (1967), open-ended questions such as "List uses for a brick" are posed. The responses are scored on fluency, originality, flexibility and elaboration. Each question is individually scored based on these four components. The operational definitions of these terms are originality, the number of unusual or unique ideas; fluency, the number of total ideas; flexibility, the number of categories; and elaboration, the additional amount of detail given for each response (Dow, 2003). This measure of creativity has been successfully used in a wide variety of experiments, strengthening it's reliability (Meeker, 1978). Similarilly, Wallach and Kogan (1965) also incorporate open ended questions into their Creativity Assessment as well, however rather than "uses" questions, "instances" questions are asked such as "Name things with wheels" (Runco, 2007).

Part of how people operate in responding to the "uses" questions has to deal with an individual's functional fixidness. This is a phenomenon that occurs when a person cannot think of a solution/response beyond the traditioanl use of an object (Runco, 2007) because they are essentially too conditioned to knowing the "proper" use for an object. They basically get "stuck" or "fixed" on the traditional use and experience difficulty thinking of a more original use for the item. The originality measurement on the Guilford's Alternative Use's Tasks can indicate if a participant is experiencing functional fixednesfs. In one study, it was indicated that 5 year old's are actually immune to this phenomenon because they have not yet been fully conditioned to the

standard uses of an object that are accepted by society (German et al. 2000). When asked to name uses for a box, the 5 year old's response was not effected by the demonstration of using a box to contain something. However, when this same task was asked of 6 and 7 year-old's, they were significantly effected by seeing the demonstration of the box. This therefore demonstrated that 5 year old's are possibly immune to functionatl fixidness and 6 and 7-year old's begin to become conditioned to standard uses for objects.

Art also provides for a good microcosm of structured or non-structured environments as demonstrated by Car & Vandiver, 2003 in their use of art projects to assess mood and creativity in children. In addition Hasici, D., & Demirkan, H. 2003 also used childrens art class experience in school as a means of studying creativity. They used art projects to assess various elements of creativity such as person, process, and product. This study of two differnt art class environments produced different results on their three measurements.

Standardization and Structure in Schools

Standardization has become more and more a part of teaching methods in schools today. For example, in North Carolina, according to The State Board of Education, they have implemented an "End-Of-Grade" test that measures the amount learned through gradse 3-8 and it is their "comprehensive plan to improve schools" (Harrison, 2012). However, many teachers and parents complain that because the teachers all across the state have to teach to the exact exams, only memorization of terms and basic skills is really being taught. An organization called North Carolina Citizens for Democratic Schools has emerged in opposition to the standardized and high stakes End-of-Grade testing (Besecker, 2001). The creator of this organization, Irv Besecker, believes that the standardization "leaves less and less room for open-ended discussions

and the opportunity to allow children to learn to think for themselves" and further concludes that "We must remember students are unique, and they will not be standardized. Schools must be dedicated to democratic principles that promote self-determination and freedom, rather than the control and manipulation provided by the North Carolina ABCs".

Many other states such as Ohio have their own versions of this testing as well (Heffner, 2012). Ohio has the Ohio Acheivement Test which also encourrages teachers to only teach the required curriculum needed to pass this test. It is argued that such high stakes standardization that all students must achieve is taking away from their ability to develop as individuals. For example, a study of 5th, 8th, and 11th grade students looked at the relationship between academic and stadardized testing grades as compared to tests on the student's divergent thinking (Feldhusen, et al., 1971). It was found that testing under game-like circumstances as opposed to standardized tests was a better predictor of divergent thinking and creativity. McGregor believes that if educators focus their teaching in more colaborative, open-ended, and dialgue-centered ways, there is a much better oppurtunity to nurture a child's individual thinking strategies (McGreggor, 2007).

Other opponents of this kind of academic environment claim that essentially the individual student is becoming just a number in the classroom to meet the academic standards and that the standardized tests cause the teacher to be more focused on creating lessons plans based around the standardized tests rather than around their student's individual needs (Bronson & Merryman, 2010). A study in 1985 was done that assessed the student teacher relationship and the ability of teachers to be able to guage their pupils scores on standardized tests. 145 pubils were used in the study. The study revealed that teachers were very off in predicting the students performance unless they had a very close relationship with the student (Doherty & Connely ,

1985). When teachers were personally involved with their students they were able to better understand the student's learning experience. Yet, if they were too focused on viewing the student's as just a number in their class, they were less likely to have an idea of how much the student actually learned.

Creativity in an Elementary School Setting

How is creativity being handled in the classroom? The traditional classroom setting has been under much scrutiny for not providing enough of an environment in which to succesfully encourrage and develop creative thinking. As more and more standardized testing seems to flood the elementary schools, the media has begun to portray societies scrutiny of the system as demonstrated in the previously mentioned 2010, *Newsweek* article which suggested a possible creativity crisis in the elementary school students of today (Bronson and Merryman 2010). The blame placed on "standardized curriculum, rote memorization, and nationalized testing" for harming divergent thinking needs to be properly analyzed, so what do the experts have to say?

Many researchers have put this scrutiny to the test by examining the effects of traditional verses open classrooms. These classrooms are based on open-ended and collaborative problem soving styles that emphasize the process of learning rather than teaching standard "formulas" for finding the correct sollution to a problem (Craig & Piper 1974, Hyman 1978, McCormick et al. 1978). This has become a popular area of study and there has been a significant amount of research done on these differing classroom structures and their effects on creativity. All three of these studies found creativity scores to be higher in the open classrooms rather than the traditional classrooms. Hyman (1978) studied students grades 1, 3, and 5 in two separate schools with 64 students being from open classrooms and 57 being from traditional classrooms. In grades 1 and 5, students from the open classrooms scored significantly higher in originality and

fluency (considered indicators of creativity) than the students from the traditional classrooms. Students in grade 3 from open classrooms scored higher in flexibility (considered an indicator of creativity) than the grade 3 students from traditional classrooms, another indicator that open classrooms stimulate more creative thinking than the traditional classroom. The traditional classroom today has a heavy emphasis on standardized testing and memorization (Harrison 2012 & Heffner 2012) and according to these studies, this environment is not correlated with encouraging and stimulating creative thinking.

Supporting the evidence found in these studies, creativity expert Mark Runco (2007) states that instead of emphasizing divergent thinking, "most educational efforts emphasize convergent thinking, and therefore may do very little, if anything for creative potentials". It seems that by emphasizing the role of education as providing students with skills to regurgitate information for standardized tests and other curriculum assessment, they are lacking the opportunity to engage in more open-ended exploratory thinking in solving problems. Not only is research exposing the weaknesses of the standardized education system, but personal accounts as well; Professor Wegerif, author of *Mind Expanding: Teaching for Thinking and Creativity in Primary Education*, explains his experience in the traditional school setting.

> "I had managed to pass tests and exams, but without real engagement in education. At school, learning was not something I did, it was something that was done to me. By the end of my formal schooling I had good grades on my final exams but I was left feeling ill-equipped to respond creatively to the real world of challenges and responsibilities that faced me outside of school" (2010).

Excellently exemplifying the shortcomings of rote memorization and standardization in the schooling system today, Wegerif describes a common attitude derived from the over-structured learning systems in schools. This is an example of the reason for why so much

research and scrutiny has been placed upon education systems today. There seems to not be enough room to explore creativity or for experimentation with thinking about original ideas.

There have been other studies such as by Forman, S. G., & McKinney, J. D. (1978) which analyzed creativity in open verses closed classrooms. This experiment found no significance results in regards to creativity scores based on open or closed classroom setting. However, "traditional classrooms scored consistently higher than those in open classrooms on measures of vocabulary, reading, and mathematics achievement" (1978). This indicates that perhaps the *Newsweek* critics are wrong in claiming that structured environments are harmful to creativity and learning and that structure is needed to at least teach students basic skills of reading, writing, and math.

However, another example of how the over-structured learning system in schools is harming creativity is expressed by Mueller (Mueller et al., 2011) who explains the existence of a bias against creativity. In this study, it was found that without even consciously realizing it, teachers were having negative reactions to creative answers. The study found that if an incredibly novel idea was suggested by a student, educators would conclude the idea to be incorrect if the idea made the educator feel too uncertain about its usefulness. The uncertainty of a novel idea actually being useful or not seemed to be the factor that caused the educators to experience unease with the original ideas. Because of this, educators are perhaps not even realizing when they give negative feedback to a student with an original idea. With standardization, rote memorization and structure, it is easier and less of a risk to simply avoid considering creative ideas that may or may not be the "correct" solution to a problem.

In a study by Flink, C., Boggiano, A. K., & Barrett, M., children were scored on their ability to learn and perform confidently in two teaching situtions (1990). One was learning from

a teacher who was instructed to teach the students to learn the information through a pressured and structured attitude and the other from a teacher who would freely help the students learn when necessary without the pressure of having them each learn the information. During the more relaxed style, the students ended up scoring much higher on performance and self-determination. This relates to the potentially stressful environment of having to complete an art project as demonstrated by the instructor rather than creating whatever the children want. Again, the pressure on the student to regurgetate the correct answer is part of the bias against creativity in the classroom.

Hypothesis

Children's average creativity scores will improve after completing unstructured art projects rather than after completing structured art projects.

Method

Research Participants/Subjects

Participants were 13 children between ages 5-7 from the Creating Landscapes Learning Center. This is a program designed to support critical, innovative, and expressive thinking and an aesthetic experience (Creating Landscapes, 2005). The body of participants consist of 6 boys and 7 girls, most from middle to upper class socio-economic families who live in the city of Meadville, PA and have gained parental consent and given their own consent.

Measures

Creativity Scores were based on four measurements used to score the creativity assessments found in Appendix A. The assessments and measurements were based on The Guilford Alternative Use's Task (Runco, 2007) because each measurement is believed to indicate high or low creativity. 1) originality, 2) fluency, 3) flexibility, and 4) elaboration. Each question was scored according to these four measurements. For originality, 1 point was given if a response was given by only between 6% to 10% of all participants and 2 points were given if a response was given by only 5% of all participants. For fluency, points were equated to the number of responses for each question. For flexibility, points were given for the total amount of categories used by each participant when responding. For elaboration, 1 point was given if the participant went into detail with his response. The higher the scores, the higher the creativity. These scores indicated the dependent variable of creativity scores.

The first independent variable was defined as the timing of the test, which had two levels: 1) pre-project and 2) post-project. The other independent variable was defined by the kind of art project which also had two levels: 1) structured and 2) non-structured.

Procedure

There were a total of four visits to the class, each visit included a 20 minute art project for the children to complete. Before and after each project, the participants completed a Creativity Assessment (Appendix A). For each project, there was a two question "Pre-Activity" and "Post- Activity" Creativity Assessment. Detailed instructions were be given to the children by my research colleague and myself for each activity (See Appendix B). Art projects were categorized into two levels - structured and unstructured. Level one consisted of two structured projects: "Color a Page Activity" and "Pinch-Pot Activity". Each involved a model that was shown to the class as an example of what their finished art projects should look like. Level two consisted of two unstructured projects, "Free Coloring Activity" and "Clay Creation Activity". The two unstructured projects involved the freedom to make whatever the children desired using the materials provided in any way they wanted. Each "Pre-Activity" and "Post-Activity" Questionnaire was added up and given a total creativity score. Each complete session was about 40 minutes long including the instruction, pre-project creativity assessments, art project completion, and post-project creativity assessments.

During the "Color a Page Activity" children were all given the same coloring page to color in with crayons. Before the activity, they were instructed to color in the picture with the crayons provided and shown two models of what the coloring pages looked like completed.

During the "Pinch-Pot Activity" children were given a handful size of clay to sculpt into

a pinch pot. Before the activity, they were instructed on how to make a Pinch-Pot and and shown a model of what a completed Pinch-Pot looks like.

During the “Free Coloring Activity” children were given a variety of colorful paper and markers, colored pencils, and crayons to choose from to draw anything they wanted. Before the activity, they were instructed to draw whatever they felt like drawing. No model or completed project was demonstrated to the participants.

During the “Clay Creations Activity” children were given a large handful of clay to create anything they wanted. Before the activity, they were instructed to sculpt, or “smoosh” or make anything out of the clay that they wanted. No model or completed project was demonstrated to the participants.

Results

Data was collected in February 2011 on the 10th, the 14th, the 17th, and the 21st. All participants completed the experiment and no ethical issues arose. Data were analyzed in a 2 x 2 within subjects ANOVA. N=13. Multivariate Tests revealed a main effect for Project Type on Creativity Scores $F(1,12)=9.387$, $p < .05$, $\eta 2= .110$. This only accounted for approximately 1% of the variance. The interaction between Project Type (structured, non-structured) and Timing of Test (pre-project assessment, post-project assessment) had an effect on creativity scores $F(1,12)=5.195$, $p <.05$, $\eta 2=.056$. This only accounted for approximately .6% of the variance. The mean creativity post-score of 12.4615 (sd = 5.29725) improved from the mean creativity pre-score of 10.1154 (sd = 2.68603) after completing the two unstructured art projects. Mean creativity post-score of 13.6538 (sd = 4.16025) decreased from the mean creativity post-score of 17.2692 (sd = 9.48818) after completing the two structured projects.

Table 1

Summary of ANOVA for Creativity Scores

Source of Variance	*SS*	*df*	*MS*	*F*	η^2
Factor					
Project Type (A)	226.389	1	226.389	9.387*	.110
Timing of Assessment (B)	5.236	1	5.236	.188	
A x B interaction	115.505	1	115.505	5.195*	.056
Subjects					
S x A interaction	289.423	12	24.119		
S x B interaction	335.077	12	27.923		
S x A x B interaction	266.808	12	22.234		
Total	2058.438	51			

$p < .05$

Table 2
Mean Pre & Post Project Creativity Scores by Session

Session	Mean Pre-Project Creativity Score	Mean Post-Project Creativity Score
Session 1 - “Color a Page” Structured	19.38	14.54
Session 2 - “Pinch Pot” Structured	15.23	12.77
Session 3 - “Free Color” Unstructured	13.92	12.15
Session 4 - “Clay Creation” Unstructured	6.31	12.76

Discussion

The experiments did not yield strongly significant results and therefore the hypothesis was not supported. Although the class mean creativity scores improved from the pre-project creativity scores compared to the post-project creativity scores in the unstructured projects and the class mean creativity scores decreased from the pre-project creativity scores compared to the post-project creativity scores, neither results were significant and there were other factors at play. Table 2 reveals an overall decrease in creativity scores by session. The overall decrease in creativity scores by session and the very high standard deviation between the scores indicate that there were possible many other confounding variables such as order of effects, the children getting more bored with the assessments over time, the participant's history, and other extraneous variables that should be considered.

Although attempts were made to treat each kind of project, structured or unstructured, with the same level of excitement it is possible that unconscious experimenter expectations were present in expecting the children to be more creative after completing the unstructured art projects.

Another interesting factor to consider is that the school that the data was gathered in promotes creative thinking and does not follow an overly structured teaching style (Creating Landscapes, 2012). It is not considered a traditional classroom. The purpose of these schools is to provide children with an environment designed to stimulate creativity and a unique learning experience, not a traditional public school experience. The purpose of this study was to create a microcosm of unstructured and structured learning environments with the two levels of art projects, however their day to day learning environment is not the standard learning environment

with over-structured standardized learning environments therefore the students' general learning environment may have over shadowed the effects of the level of structure in the art projects.

The teachers at Creating Landscapes mentioned that some of the children had rarely colored in coloring book pages because they also felt the same about that kind of art form being too constricting and structured. This history of the participants may have given them a different perspective on the coloring book structured project. They may have not experienced it as a structured standard coloring activity, but a new and different coloring activity which maybe have given them a different experience than expected.

In addition, another difficult variable to control was the children discussing their answers to the creativity questionnaire assessments with each other as they were completing them. The teachers and I repeatedly reminded the children not to give each other answers and to use their own ideas. Of course, once it has been done, you cannot undo it. The majority of answers were scored as unoriginal and this could have been effected by the amount of answer sharing occurring, therefore this also probably had an effect on the originality component of the experiment.

Although the results of my study provided support to my hypothesis that non-structured art projects stimulate creativity more than structured projects, it is important to consider all of the aforementioned variables that could have had an effect on the results. More testing on a larger scale would be needed to help confirm my results.

Despite these possible confounding variables, the results are similar to previous studies on creative development, structure, and environment such as McCormic et al.'s study in 1978. This study assessed the influence of open verses traditional classroom setting on creativity in elementary school students. First of all, a much larger body of participants from 20 traditional

classrooms and 20 open classroom were used which gives this experiment much more generalizability than the results found within the Creating Landscapes body of 13 participants. McCormic et al. found similar findings in that the open, less structured classroom settings resulted in children having higher creativity scores than children in a traditional more structured setting. The open classroom was defined as "personally oriented" and the traditional classroom was defined as "achievement oriented". Although the study's use of the general environment differed from individual art projects as a means for studying creativity, McCormic et al. concluded that "open classrooms develop the self-esteem and confidence needed to perform in non-structured situations, enabling even the youngest children to express their creativity more fully". This both supports my hypothesis and is consistent with the results at The Creating Landscapes School.

An interesting idea to consider is that the open classroom referred to in McCormic et al. were very similar to the classroom style at Creating Landscapes. This could indicate that if my study was completed multiple times at Creating Landscapes the creativity scores of the students may even out and show little difference between creative improvement based on the different levels of structure of the art projects. Possibly the general environment at Creating Landscapes as a whole may eventually override the influence of the art projects if the experiment was repeated. It would also be interesting to conduct the same study at a Meadville public elementary school of a similar demographic and compare those results with those at Creating Landscapes. Also, a much larger body of participants from 20 traditional classrooms and 20 open classroom was used which gives this experiment much more generalizability than the results found with the Creating Landscapes body of 13 participants.

Even though my research was not conducted in a standardized public school environment, the results still show that a more structured approach to art projects potentially impedes the creative process as shown by other researchers (McCormic et. al, 2003, & Car & Vandiver, 2003). Car & Vandiver's study, which specifically focused on structured and non-structured art projects, found that children's creativity scores and their mood improved after completing the non-structured art projects where they were free to create whatever they wanted with the material provided. Interestingly, this study was conducted in an emergency shelter for children and still produced these results. Similarly, within the context of the Creating Landscapes School, creativity improved even in the more open environment of the school thus demonstrating the need for an open non-structured environment to foster creativity in a school population and further research to be conducted to determine other methods of creativity development and improvement.

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APPENDIXES
Appendix A.

Coloring Page Creativity Assessment: Session 1

Pre Coloring Page Activity

1. List things that are heavy

2. List uses for a bucket

Post Coloring Page Activity

1. List things that lightweight

2. List uses for a rock

Clay Pinch Pot Creativity Assessment: Session 2

Pre Clay Pinch Pot Activity

1. List things that are yellow

2. List uses for a chair

Post Clay Pinch Pot Activity

1. List things that are green

2. List uses for a deck of cards

Free Coloring Creativity Assessment: Session 3

Pre Free Coloring Activity

1. List things that are soft

2. List uses for a stick

Post Free Coloring Activity

1. List things that are slimy

2. List uses for a blanket

Clay Creations Creativity Assessment: Session 4

Pre Clay Creations Activity

1. List things that are square

2. List uses for brick

Post Clay Creations Activity

1. List things that are round

2. List uses for a box

Appendix B.

Script for Experimentation at Creating Landscapes Learning Center

First Session:

1. Experimenters will meet the class in their classroom.

   Hi, my name is Carolina DiPerna, and my name is Emily Allerton. We are working on our senior projects at Allegheny College, and want to see if you would be interested in taking part. We will be doing an art project in this classroom in a few minutes. If you'd like to do this project with Emily and I please sit at these two tables. If you don't want to do this, please raise your hand.

2. Those children who would like to participate or not participate go to their seats as directed.

   Thank you for doing the project! Our research project will happen over a course of 4 sessions. We will come back later in the week and next week to do other art activities with you. Before we start, could you please answer the smiley face questions and Emily's questions on the first page of the packet we gave to you?

   We will also be taking pictures of what you make throughout the project and asking you to fill out another short paper while you are working. These are to show our teacher.

   Today our objective is to color a page that we have created for you. Bell ringer: What is a line? Can someone please raise their hand and answer the question if you know it? Yes, a line is a mark that is long in comparison to its width and made with a pencil, pen, or other tool. There are lines on the pages that we have given you.

3. Children are shown examples of what they will be completing.

   Today we will be coloring pages. Many of you may color these at home in your coloring books. Often people like to fill inside the lines with color so it makes a pretty picture if you don't feel like drawing them yourself. I used to color in coloring books all the time. I will show you a few examples of pages Emily and I have colored.

   2-3 examples of colored pages that Emily and I have completed will be shown to the students. All will be shown with the color inside of the lines.

4. Experimenters give instructions to the children about the coloring pages.

   So, for our project today you'll be coloring a color page. You are able to use any of the materials provided at your table. After 5 minutes of coloring Emily and I will ask you to

complete another quick questionnaire. When you are done with your page please bring it to me or Emily so we can take a picture of your project. We will then give you some more instructions.

5. Students are told by Emily and Caroline to go back to their seats and begin working.

6. Students bring forth their work to be photographed.

   For the final part of our project, will you please complete the final two questionnaires that we have just handed you. You can bring these to Emily and I when you are done.

7. Students bring their completed questionnaires to Emily and I.

   Thank you for handing this in. Now you may go to your seat and read some of the books here in your classroom. Your teacher will then give you directions on what to do.

8. Dismissal of session and experimenters leave.

   Thank you all for doing this project! We really appreciate it. We will be back later this week if you'd like to work on another activity with us.

Second Session:

1. Experimenter will enter classroom.

   Hi girls and boys! Emily and I are back again. For anyone who was absent last time, our names are Emily Allerton and Carolina DiPerna. We are back here at your school again doing our senior projects for Allegheny College. We will be doing an art project in this classroom in a few minutes. If you would like to do this project with Emily and I please sit at these two tables. If you do not want to do the project, please raise your hand.

2. Students who want to participate go to their seats as directed.

   Thank you for doing the project again. Like last time we need you to fill out a few questions before we start. Please answer the first two pages in the packet Emily and I hand to you.

3. After handing out the questionnaires, the experimenters will explain the activity for this session.

   Today your objective is to create the shape that Emily and I have molded out of clay. This is called a pinch pot. Bell ringer: What are some uses for a pot? Can someone please raise their hand and answer the question if you know it? Yes, a pot can be used to hold things such as plants, spare change, and paperclips.

4. Children are shown examples of what they will be completing.

Today we will be making pinch pots. Some of you may have made these before. Pinch pots are handy because you can store things in them. I will show you a few examples of pages Emily and I have made.

The examples made by Emily and Caroline will be shown, as well as a quick demonstration of how to make these.

5. Experimenters give instructions to the children about making the pinch pot.

   So, for our project today you'll be making a pinch pot. You are able to use any of the materials provided at your table. Pinch pots are made from clay. After 5 minutes of molding, Emily and I will ask you to complete another quick questionnaire. When you are done with your pot bring it to me or Emily so we can take a picture of what you have made. We will then give you some more instructions.

6. Students are told by Emily and Caroline to go back to their seats and begin working.

7. Students bring forth their work to be photographed.

   For the final part of our project, will you please complete the final two questionnaires that we have just handed you. You can bring these to Emily and I when you are done.

8. Students bring their completed questionnaires to Emily and I.

   Thank you for handing this in. Now you may go to your seat and read some of the books from your classroom until everyone else is done. Your teacher will then give you directions on what to do.

9. Dismissal of session and experimenters leave.

   Thank you all for doing this project! We really appreciate it. We will be back next week if you'd like to work on another activity with us.

Third Session:

1. Experimenter will enter classroom.

   Hello again! Emily and I are back again. For anyone who was absent last time, our names are Emily Allerton and Carolina DiPerna. We will be doing an art project in this classroom in a few minutes. If you would like to do the project with Emily and I please sit at these two tables. If you don't want to do the project please raise your hand.

2. Students who want to participate go to their seats as directed.

   Thank you all for doing this project. Like last time we need you to fill out a few questions before we start. Please answer the first two pages in the packet Emily and I hand to you.

3. After handing out the questionnaires, the experimenters will explain the activity for this week.

   Today your objective is to draw freely. That means you can draw whatever you want. Bell ringer: What is freedom? Can someone please raise their hand and answer the question if you know it? Yes, freedom is being able to do what you feel is right.

4. Children are told what free drawing is.

   Today we will be making drawings. Some of you may draw in your free time. Drawing freely is different than drawing in a coloring book.

5. Experimenters give instructions to the children about drawing freely.

   So, for our project today you can draw whatever you'd like. You are able to use any of the materials provided at your table. Draw what comes to your mind. After 5 minutes of drawing, Emily and I will ask you to complete another quick questionnaire. When you are done with your drawings please bring it to me or Emily so we can take a picture of your project. We will then give you some more instructions.

6. Students are told by Emily and Caroline to go back to their seats and begin working.

7. Students bring forth their work to be photographed.

   For the final part of our project, will you please complete the final two questionnaires that we have just handed you. You can bring these to Emily and I when you are done.

8. Students bring their completed questionnaires to Emily and I.

   Thank you for handing this in. Now you may go to your seat and read some of the books from your classroom until everyone else is done. Your teacher will then give you directions on what to do.

9. Dismissal of session and experimenters leave.

   Thank you all for doing this project! We really appreciate it. We will be back later this week if you'd like to work on another activity with us.

Fourth Session:

1. Experimenter will enter classroom.

   Hello for one last time! Emily and I are back again. For anyone who was absent last time, our names are Emily Allerton and Carolina DiPerna. We are back here at your school for one last time and working on our senior projects for Allegheny College. We will be doing an art project in this classroom in a few minutes. If you would like to do the project with

Emily and I please sit at these two tables. If you do not want to do the project please raise your hand.

2. Students who want to participate go to their seats as directed.

   Thank you all for working on this project. Like last time we need you to fill out a few questions before we start. Please answer the first two pages in the packet Emily and I hand to you.

3. After handing out the questionnaires, the experimenters will explain the activity for this week.

   Today your objective is to create the anything you want with the clay we give you. Our activity today is called "Clay Creations". Bell ringer: Does anyone remember what it is called when you make clay into a shape? Can someone please raise their hand and answer the question if you know it? Yes, molding is how you make a shape with clay.

4. Children are told what clay creations will consist of.

   Today we will be making clay creations. Although we worked with clay once already, this time you can make whatever you want. Like free drawing, you have freedom to make whatever you would like with this clay.

5. Experimenters give instructions as to how to go about making clay creations.

   So, for our project today you'll be making a clay creation. You are able to use any of the materials provided at your table. Create anything you want. After 5 minutes of molding, Emily and I will ask you to complete another quick questionnaire. When you are done with your creation please bring it to me or Emily so we can take a picture of what you have made. We will then give you some more instructions.

6. Students are told by Emily and Caroline to go back to their seats and begin working.

7. Students bring forth their work to be photographed.

   For the final part of our project, will you please complete the final two questionnaires that we have just handed you. You can bring these to Emily and I when you are done.

8. Students bring their completed questionnaires to Emily and I.

   Thank you for handing this in. Now you may go to your seat and read some of the books from your classroom until everyone else is done. Your teacher will then give you directions on what to do.

9. Dismissal of session and experimenters leave.

Thank you all so much for participating in these projects the past couple of weeks. You guys did a great job with all the projects. We really appreciate your all of your hard work! The reason we were doing this experiment is to see if one of the projects made your mood better. We also wanted to see if you felt more creative after doing these projects. Does anyone have any questions for me or Emily? Ok, well thank you again. If you do have any questions, please let your teacher know and she will pass them on to me. It was so much fun working with all of you! Have a good rest of the day.