FEATS scores of older adults using the PPAT assessment.

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ABSTRACT

This study examined if the developmental changes that occur in the brain and the body from the regular aging process impacted the graphic features that can be observed in an artwork. To measure changes in graphic features, a traditional art therapy assessment, the "Person Picking an Apple from a Tree" (PPAT) assessment, was utilized because of the assessment's quantitative scoring system known as the Formal Elements of Art Therapy Scale (FEATS). Two groups of 24 normative adults each, a total of 48 normative adults for the study, were asked to fill out a survey and create a PPAT drawing. The first group consisted of adults aged 18-55. The second group consisted of adults ages 70 and older. The FEATS scores derived from each group's PPAT drawings were compared. Factors influencing each group's FEATS scores such as education level, amount of exercise, and experience making art, were examined using linear regression. The information gleaned from this study will improve the validity and utility of the PPAT assessment and may improve therapy work with older adults when the use of artwork is considered.

Keywords: Art therapy, PPAT, FEATS, Normative, Older adult, Development

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CHAPTER I

Introduction

The older adult population in America is projected to exceed the number of children in the United States by 2034 (Vespa, 2019). Vespa (2019) affirms by 2030, Americans 65 and older will account for 21 percent of the U.S. population, and by 2060, this same population may make up one in four Americans. The increase of older adults in society will bring new challenges for mental health professionals that, according to the Substance Abuse and Mental Health Services Administration (SAMHSA) (2019), we are ill-prepared to handle. SAMHSA (2019) notes many geriatric specialists often receive little training in addressing serious mental illness (SMI) in older adults. While the Administration of Community Living (ACL) (2021) states that 27% of people over the age of 65 struggle with cognition in general, 4.8% of older adults present with SMI (SAMHSA, 2019). To screen for cognitive health in older adults, mental professionals are likely to use assessments that have been proven reliable in use with young or middle-aged adults. However, if one considers the unique developmental changes that take place in the later stages of life, it is possible that the normative results of any assessment may be different from the results of these younger adults.

Multiple cognitive and physical changes that occur in the late stages of life may impact assessment results. Kernisan (2018) deduced that in normal cognitive aging, the brain works slower than the brains of younger adults in a few different ways. Processing speed, attention, memory, language capability, executive functioning such as planning and organizing, and spatial abilities are all impacted by the aging brain (Kernisan, 2018). She notes that fluid intelligence, which is related to problem-solving and the intake of new information, is what primarily declines when a person ages. These natural changes in the brain may put an older person at a

disadvantage if they were to participate in an assessment that required quick responses, organization, ideation, or was impacted by their declining speech abilities. Besdine (2020) notes that the first signs of physical aging usually involve the musculoskeletal system. The ligaments of joints tend to stiffen, muscle mass decreases, and vision and hearing begin to decline. The brain receives less blood, which is likely related to its slower functioning. Chemical signals from the neurons of the brain tend to change. Nerve cells signal and repair themselves more slowly and may incompletely regenerate when damaged (Besdine, 2020). These changes in the physical body of the older adult may impact assessments that require fine motor skills and information from the senses. The change in an aging brain offers a good reason to think that an elderly normative assessment would be different than an adult normative assessment.

Deaver (2016) explains that normative data serves as the standardized reference of a particular clinical population for gauging an assessment. Normative assessment data is generally gathered from non-clinical populations and is used as a baseline comparison for an assessment completed by a client. A therapist or rater would compare the client's assessment to the normative assessment data to make clinical inferences. Deaver (2016) comments on the absence of large amounts of normative assessment data in the field of art therapy, which in turn hinders the validity of many art therapy assessments. To date, it appears the only art therapy assessment that has explicitly explored assessment data of the cognitively normative elderly adult is the Clock Drawing Test (CDT). The CDT is an art-based assessment where the client is asked to draw a clock. This assessment is used to screen for cognitive impairment and other organic diseases such as dementia, and as such has often been intentionally directed to older adults (Mazancova et al., 2017). Multiple studies from a variety of cultures have established normative CDT data for a healthy elderly population (Emek-Savas et al., 2018; Mazancova et al., 2017;

Merims et al., 2018; Shanhu et al., 2019). Given the distinctive changes that occur in elderhood, the need for normative elderly data is likely relevant for any assessment administered to this population.

One of the most popular assessments used in art therapy is the Person Picking an Apple from a Tree (PPAT) assessment. As noted in the official rating manual, the PPAT is scored using a quantitative measuring scale that was designed specifically for this assessment (Gantt & Tabone, 1998). That scale is known as the Formal Elements Art Therapy Scale (FEATS). The 14 different scales of the FEATS observe features of a drawing rather than the content of the art. Bucciarelli (2011) conducted a study to establish normative data for adult PPATs using a sample of 100 college students. While her research filled a necessary niche in verifying normative adult PPAT scores, these normative scores may still be inapplicable to older adults. Currently, normative PPAT assessment data for an older adult population has not been established or even considered in the literature. This research aims to rectify this deficiency by exploring how the developmental effects of aging impact a PPAT drawing and how those changes will affect the resulting FEATS scores of that artwork.

Definition of Keywords

Art therapy is defined as "a mental health profession that enriches the lives of individuals, families, and communities through active art-making, creative process, applied psychological theory, and human experience within a psychotherapeutic relationship (American Art Therapy Association, 2022). The acronym *PPAT* stands for the "Person Picking an Apple from a Tree" art therapy assessment, which has been used by art educator researchers since around 1940 but has been popularized by the advancements and publications of Gantt & Tabone (1998). Similarly, the acronym *FEATS* stands for the "Formal Elements Art Therapy Scale,"

which is a 14-feature rating scale developed by Gantt & Tabone (1998) used to rate, measure, and quantify the graphic elements of the PPAT drawing.

The remaining definitions are tailored to how they are expressed and used in this research. The use of the word *Normative* refers to any participants or qualities that represent a population that is unaffected by any mental or physical disorders or conditions that are likely to influence the creation of a PPAT drawing. For the most part, this will encompass the general population. What defines someone as an *Older adult* is usually their age and varies throughout multiple forms of research and literature. While people are sometimes described as older adults from as early as the age of 50, this study refers to older adults as those people who are age 70 and older. Finally, *Development* in this research refers to human development, more specifically, the age-related stages of the human body that mark the natural occurrence of the cognitive and physical changes of an individual.

CHAPTER II

Literature Review

This literature review will first expand on the cognitive aspects of aging, with its content focused on the changes that may impact the results of an elderly person taking the PPAT assessment. Similarly, only the normative physical changes that are likely to impact the result of an assessment will be discussed. The structural changes in the brain will be reviewed since it is probable these changes in the brain will have influenced the cognitive factors previously discussed. Then the changes in vision and hearing, the musculoskeletal system, and the influence of exercise on the brain and body will be examined. Afterward, the Clock Drawing Test (CDT) will be discussed in more detail, and the trends in the normative elderly data derived from the CDT will be examined. All the information about the normative elderly will then be applied to the PPAT and FEATS scoring system. The optimal assessment environment for the elderly will be considered. A brief hypothesis of how elderly aging will impact each of the 14 scales of the FEATS will be revealed. This literature review will conclude with considerations of additional population data to be collected so that within-group differences can be studied.

Cognitive Age-Related Changes

The following categories of cognitive functioning have been proven to be impacted by the regular aging process. Each category will quickly be defined, then pertinent information concerning the elderly will be noted.

Processing Speed

Processing speed is how quickly a person can perform cognitive tasks. It declines gradually with age, possibly in a linear fashion (Kernisan, 2018). It may be the most evident sign of cognitive aging and tends to influence all other cognitive capabilities (Harada et al., 2013;

IOM, 2015). The Institute of Medicine (IOM) (2015) mentions that the ability to remember verbal instructions and to organize important information may directly be affected by the decline of processing speed in older adults. They note however that experience in a task may offset this disadvantage, for example, frequent typing of documents may preserve typing speed even in aged adults.

Attention

Attention refers to a person's capacity to process information (IOM, 2015). This area is divided into three types: selective attention, divided attention, and sustained attention. Selective attention refers to the ability to filter unwanted information while maintaining focus on a subject. Divided attention, also known as multitasking, is the ability to stay focused on two things at once. Sustained attention is the ability to concentrate on something for a lengthy period. In general, selective attention and divided attention tend to worsen with age while sustained attention stays relatively the same (IOM, 2015; Kernisan, 2018). Harada et al. (2013) also affirmed that an elderly person's auditory attention span shows only a small decline in later stages of life.

Memory

Multiple forms of memory are each impacted differently in aging adults. There are 6 sub-categories of memory: Working, Episodic, Semantic, Prospective, Procedural, and Source memory. Working memory is the ability to hold information in the mind while it is being used or processed. IOM (2015) states this memory system is linked to solving problems, decision making, and language processing. This memory overall declines with age. Harada et al. (2013) note that working memory has three stages: acquisition, retention, and retrieval. The speed of acquisition and retrieval slows with age, though the retention of data is generally preserved.

Episodic memory is autobiographical; it is the memory of lived experience and all of the senses involved. This includes places, times, and emotions of important events. This memory declines with age, and declines are greater with more complex or vague memories (IOM, 2015). Semantic memory is the storage of factual information. This memory is not only retained through old age but may keep increasing into the seventh decade of life and only slightly decline in the later decades (IOM, 2015). Research by Lalla et al. (2022) suggests that with the decline of episodic memory later in life, older adults may resort to using more of their semantic memories when making decisions.

Prospective memory is the capability to remember to do something in the future. There are two types of prospective memory, time-based and event-based. Time-based refers to remembering to do something at a certain future time. Event-based is remembering to do something after a particular event occurs. Memory declines with age in both forms of prospective memory, though the decline is greater in the time-based variety (IOM, 2015). Interestingly, Koo et al. (2021) posit from their findings that IQ seems to be associated with changes in time-based prospective memory. Procedural memory involves remembering how to do or perform a certain activity, such as driving a car or answering the phone. IOM (2015) notes that this form of memory is relatively stable throughout the lifespan. Older adults may take longer and need more practice to learn a new skill, though once learned will usually have no trouble performing the task thereafter. Finally, source memory refers to remembering the context or details that surround a remembered event, for example, remembering where one learned a piece of information. A study by Mitchell & Hill (2018) further explored how older adults remember or encode source information. To summarize the results, it seems that older adults and younger adults seem to pick up different kinds of information when learning something new, and

the way this information is retained is similar in both groups despite the different information perceived. However, the literature repeatedly finds older adults scoring lower on source memory studies, which may suggest older adults are perceiving less discernable information, or there is some challenge in the mental retrieval of that information. Overall, the IOM (2015) states this form of memory declines with age.

Language

Language refers to abilities that involve speech, writing, reading, or name recalling. Harada et al. (2013) claim that vocabulary stays consistent through old age and improves over time. However, the IOM (2015) affirms that vocabulary begins to decline in very old age. While vocabulary retention is uncertain, both sources agree that the ability to find words for language production decreases with age. It seems the ability to recall a name or name a common object from a visual cue seems to decline after the age of 70 (Harada et al., 2013; Howieson, 2015). The IOM (2015) states that the sentences of the elderly are often syntactically less complicated than those of younger adults, and the correct spelling of familiar words begins to decline with age as well. They state that older adults tend to have difficulties understanding language that is either distorted or too fast. One area of language that stays intact for the elderly is the comprehension and meaning of words (IOM, 2015).

Executive Functioning

Executive functioning involves abilities such as abstract thinking, planning, reasoning, mental flexibility, and problem-solving. Harada et al. (2013) state that older adults usually think in more concrete ways when compared to younger adults. They affirm that abstract thinking, concept formation, and reasoning with unfamiliar material declines with age. They also mention that older adults have less response inhibition, which is the ability to inhibit an automatic

response in favor of a new response to a circumstance. Howieson (2015) says older adults conceptualize problems slower and are less flexible when a situation suddenly changes. The IOM (2015) notes that the elderly struggle more when asked to move back and forth between tasks. Interestingly, they state that the ability to interpret proverbs decline with age, but Harada et al. (2013) says proverb interpretation is an ability that remains stable throughout life.

Spatial Ability

Spatial ability deals with visual perception and one's understanding of two-dimensional and three-dimensional space. Harada et al. (2013) assert that aging adults struggle more with visual construction skills, which entails putting together many parts of something to make a whole object. They state older adults keep their visuospatial abilities, but a few sources claim otherwise. Howieson (2015) refers to how seeing a misplaced item among other items becomes more difficult with age. The IOM (2015) mentions that the elderly have more difficulty in mental rotation and visualization tasks than adults. They note that older adults can be less capable of perceiving three-dimensionality in drawings. As an example, they present a study where older adults and younger adults were asked to draw a cube. The cube drawings by the older adults were less accurate. When presented with several cube drawings with some being correctly proportioned and some being distorted by varying lengths or degrees of angles, they had trouble discerning between the correct cubes and the distorted ones. Interestingly though, older adults were just as capable at copying an image of a cube after being told some information about the size of the lines in a cube drawing (IOM, 2015).

Physical Age-Related Changes

The physical features that change via normative aging that may potentially influence a Person picking an Apple from a Tree (PPAT) drawing include the brain, our vision and hearing,

and our musculoskeletal system. Exercise and its influence on the brain and body will also be discussed here.

The Brain

As a person begins to age, the brain structurally changes in a way that is backward from its development from adolescence to adulthood (Saxon et al., 2015; Wnuk, 2019). Wnuk (2019) relates this process of change to a "last in, first out" (para. 11) theory, where the first parts of the brain to degenerate were the last parts of the brain to finish developing. Saxon et al. (2015) further support this notion by mentioning how neuroimaging studies such as CT and MRI scans demonstrate selective atrophy of certain areas rather than all over degeneration. The parts of the brain most affected include the prefrontal cortex, cerebral cortex, cerebellum, and hippocampus (Herold et al., 2019; Wnuk, 2019).

Changes in these brain structures are also linked to neuronal changes and losses. Wnuk (2019) notes that as we age, the development of new neurons slows, amounting to an overall loss in neurons over time. The dendrites of neurons, which are the branches of neurons that communicate electrical and chemical messages to other neurons, begin to shrink and become less complex. This pruning of dendrite branches and shrinking of neurons are likely disrupting the coherency and strength of messages being transmitted throughout the brain (Howieson, 2015; Saxon et al., 2015). Saxon et al. (2015) provide an example of altered communication in the brain. They state that the cerebral cortex, in which part of its job is to manage motor control, may continue to respond and receive messages after the source of stimulation has stopped. These leftover messages may interfere with new incoming messages, which may account for slowed processing speed and increased susceptibility to distractions (Saxon et al., 2015). The decline in dendrite branches also reduces the number of chemical receptors in the brain, which may alter

the number of neurotransmitters found within the synapse of the brain (Wnuk, 2019). For example, Wnuk (2019) comments that the neurons of older minds tend to synthesize dopamine less, which may alter patterns in memory, sleep, and mood. The overall effects of neuronal loss in certain parts of the brain also account for brain shrinkage (Howieson, 2015; Saxon et al., 2015; Wnuk, 2019).

Vision, Hearing, Skeletal, and Muscle Changes

The changes in the lens of the eye are likely to make the most difference when taking a psychometric test. The lens becomes stiffer, denser, and begins to yellow with age (Besdine, 2020; Saxon et al., 2015). The gradual yellowing of the lens eventually creates a shift in color perception, though many older adults are unaware of this shift because of its slow onset (Saxon et al., 2015). Bright colors such as yellows and reds are still easily discernable, though darker shades of blues and greens can become more challenging to discern (Saxon et al., 2015). Besdine (2020) notes that blues may begin to look like greys, and blue lettering or black lettering on a blue background may be a challenge to read. Contrasting colors may also aid in judging distances and depth perception (Saxon et al., 2015). Saxon et al. (2015) mention how this shift in color perception is great enough to interfere in practical situations, for example, discerning between the colors of two different medications. Near-sightedness diminishes while far-sightedness improves with age (Saxon et al., 2015). A few other changes to vision that she notes involve decreased sharpness, poorer light and dark adaption, increased sensitivity to glare, reduced peripheral vision, and a higher visual threshold. Visual threshold refers to how much light is needed to take in the maximum amount of information from the environment.

Hearing high-pitched sounds declines first with age, while later stages of life may also make middle and low-pitched sounds hard to hear (Besdine, 2020; Saxon et al., 2015). Saxon et

al. (2015) note how in the English language, consonants have higher frequencies than vowels. An older English-speaking adult may need others to properly enunciate the consonants of words, or they may have trouble distinguishing what was said. The physical changes to the ear itself, which include stiffer skin, ear hair, and the thinning of tissues, also increase the likelihood of ear wax build-up (Saxon et al., 2015).

Bone mass and density reduce with age (Besdine, 2020; Saxon et al., 2015). This is because the aging body absorbs less calcium from food which is necessary for bone strength (Besdine, 2020). Besdine (2020) notes certain bones become weaker than others from the aging process. These vulnerable bones include the end of the thigh bone at the hip, the ends of the arm bones toward the wrist, and the bones of the spinal column. As vertebrae become less dense and the spinal disk in between them becomes thinner, the spine becomes shorter which makes the older adult shorter than they once were (Besdine, 2020). Saxon et al. (2015) note these thinning disks of the spine may also reduce body flexibility. Cartilage in general becomes rougher, reducing flexibility at joints throughout the body. The strength of tendons and ligaments decreases with age, also reducing mobility (Saxon et al, 2015).

Muscle mass and strength tend to reduce with age (Besdine, 2020; Saxon et al., 2015). Besdine (2020) reasons this reduction is likely due to hormonal changes such as with testosterone, or from an inactive lifestyle. He states a regular amount of muscle loss from aging is about 10 to 15% throughout the lifetime. More fast-contracting muscles are lost in the aging process than slow-contracting muscles (Besdine, 2020).

Exercise

The benefits of exercise for the elderly include better cardiovascular health, more muscle and bone mass, more flexibility and balance, improved metabolic functioning and blood

pressure, heightened mood, and better cognitive functioning (Saxon et al., 2015). Herold et al. (2019) suggest that this improved cognitive working may come from improved blood circulation to the brain. He notes that higher levels of oxygenated hemoglobin in the brain seem to alter brain activation patterns. This activation of different parts of the brain that may not otherwise be in use is what is responsible for the cognitive improvement witnessed in these older adults. He goes on to say that whole-body muscle strength seems to be associated with better scores on cognitive exams. Interestingly, improved leg strength and higher handgrip strength are also linked to higher cognitive test scores. He notes that muscle structure in the body is linked to the brain structure, implying that the physical body one inhabits, and its capabilities, influence overall cognition.

Besdine (2019) considers additional factors of the elderly and exercise. He says while exercise often means for many the acceleration of heart rate and activation of muscles, those over the age of 70 may still see many of the same benefits from simple aerobic activities such as walking or gardening. He lists four varieties of exercise: endurance, muscle training, balance, and flexibility. He states endurance exercises such as walking, dancing, or swimming appear to offer the most health benefits for the elderly.

Art Therapy and Older Adults

A brief overview of the broad uses and effects of art therapy with older adults will aid in understanding this research, as well as the Clock Drawing Task (CDT) that is often used with this population. Art therapy with older adults is most frequently encountered when treating people who already have some established condition such as dementia or Alzheimer’s disease (Galassi et al., 2022). This is because the unique nature of art therapy offers many advantages in assisting these individuals. For example, due to cognitive decline, dementia, or other organic

brain disorders, these older adults may have difficulty communicating verbally and can do so more proficiently through making art (Purdue, 2023). Older adults tend to have experienced more losses than their younger counterparts simply by being on this earth longer, and it is unfortunate that some conditions such as depression may be considered a natural part of aging by some people (Purdue, 2023). The research thus far has demonstrated that art therapy is effective at reducing and preventing depressive and anxiety-based symptoms through social elements inherent in many art therapy activities (Masika et al., 2020). Galassi et al. (2022) even posits socialization and the reduction of depressive symptoms as 2 of the 4 main themes to emerge from a thematic analysis of various art therapy studies with older adults. The other themes being improved cognitive performance and enhanced self-identity and sense of meaning.

Masika et al. (2020) expands on art therapy's effectiveness in preventing and repairing cognitive decline. They note that the more creativity involved in an intervention, as well as more reflective and art education elements involved, the more cognitive benefits older adults may yield from such interventions. While all older adults may cognitively benefit from art therapy, those with some degree of cognitive decline may see more benefits from art therapy. By analyzing multiple studies, they conclude that the art therapy literature seems to report beneficial gains to working memory, episodic memory, attention, and visual spatial cognition. As for enhanced self-identity and meaning, Purdue (2023) comments on the flexibility of art therapy directives and how processes can be adapted to even those with disabilities, empowering and enabling those individuals. Furthermore, artworks could assist an older adult in recording their life experiences in a way that empowers and amplifies the voice of these older adults, helping to consolidate the meaning they derive from their unique lived experience.

Galassi et al. (2022) refer to a study in their meta-analysis that utilized the CDT with a sample of 91 older adults. It was found that after 10 weeks of art therapy sessions, cognitive performance had improved and one of the assessments used to measure this improvement was the CDT. Since the intent of this study is to examine how the developmental influences of aging, including cognition, influence the result of a Person Picking an Apple from a Tree (PPAT) drawing, it is pertinent to examine the CDT itself and what it has uncovered thus far in the literature.

The Clock Drawing Task and Normative Elderly Data

The Clock Drawing Task (CDT) is one of the most used assessments for older adults to test for cognitive impairment, Alzheimer's disease, or dementia (Mazancova et al., 2017; Merims et al., 2018; Shanhu et al., 2019). It is sometimes used in conjunction with other cognitive assessments such as the Mini Mental State Examination (MMSE) (Mazancova et al., 2017; Merims et al., 2018), the Mini-Cog scale, or the Montreal Cognitive Assessment (MoCA) (Shanhu et al., 2019). Multiple authors claim the assessment is a powerful cognitive screening tool due to the many mental functions it takes to draw a clock (Mazancova et al., 2017; Merims et al., 2018; Shanhu et al., 2019). They collectively explain that the functions involved through various steps of the task include long-term memory, executive functions, visuospatial abilities, motor abilities, abstract thinking, and attentional efforts. Shanhu et al. (2019) explain that there are two ways the assessment can be administered, where the client draws the circle of the clock, or the client is handed a pre-drawn circle to fill in. What is more interesting though is that there are over 20 different scoring systems that have been published to assess the CDT task (Shanhu et al., 2019). Since there are two administration methods and multiple scoring systems, the way the assessment is given to clients varies. While the CDT has been proven a useful screening tool

throughout multiple cultures, the disadvantage of the test resides in its unstandardized administration and scoring formats. Despite the many scoring methods, various studies have elucidated common themes in the data of healthy older adults that will now be discussed.

The influence of age and education level of the client is consistently mentioned in the literature as influencing the CDT assessment (Emek-Savas et al., 2018; Mazancova et al., 2017; Merims et al., 2018; Shanhu et al., 2019). As a rule, the higher the client's age, the lower the scores, and the higher the education, the higher the scores (Merims et al., 2018). Merims et al. (2018) gathered data from multiple age groups and created 3 categories, ages 20-39, 40-59, and 60-86. The oldest age group reported statistically significant lower scores than the other groups. Emek-Savas (2018) noted that age primarily seems to affect clock representation, which involves placing the hands of the clock in the correct area. They continue by stating that education levels seem to affect the accurate placement of numbers. In a study by Shanhu et al. (2019), education was demonstrated as a statistically significant factor among 3 education levels from primary school to university education. Emek-Savas (2018) also noted that those people employed in academic occupations scored similarly to the educated groups. Age and education aside, there appears to be no evidence of differences among genders (Emek-Savas et al., 2018; Mazancova et al., 2017; Merims et al., 2018; Shanhu et al., 2019). Merims et al. (2018) state the assessment also seems to resist subtle cultural influences among a similar population.

The Person Picking an Apple from the Tree Assessment with Older Adults

All information previously mentioned may be utilized to inform researchers how to best conduct a Person Picking an Apple from a Tree (PPAT) assessment with older adults. This researcher hypothesized what differences they might suspect to witness in each of the PPAT's 14

scales. Additionally, this researcher discerned what covariate information should be gathered from participants to observe within-group differences.

Optimal Assessment Conditions

Saxon et al. (2015) and Besdine (2020) demonstrated the effects of vision and hearing of the elderly. Considering that administering the PPAT involves speaking the instruction to the client then the need for the client to draw the prompt on paper with marker, a PPAT assessment should take place in a well-lit and non-distracting environment. To best communicate assessment instructions, an English-speaking researcher needs to remember to properly enunciate the consonants of their words while standing in front of the client and out of their peripheral vision. The researcher should speak slowly, keeping in mind the slower processing speed of older adults and their tendency to not understand words that are said too quickly.

Hypothesized Differences with Older Adults in each PPAT Scale

Based on the literature herein, the hypothesized changes of scores on each of the PPAT scales that may differentiate an elderly PPAT drawing from an adult PPAT drawing are listed below according to their scale number in Gantt & Tabone (1998). A brief definition of each scale will precede each hypothesized difference:

> **Prominence of Color.** This scale refers to how much color a person uses in the drawing and is measured by how many elements of the drawing are colored in. Gantt & Tabone (1998) notes that color is often related to affect, which may cognitively be linked to episodic memory. Episodic memory, and the emotions that may be evoked from their memories by drawing the PPAT, declines with age. A small decrease on this scale would be plausible.

Color Fit. This scale assesses how representative the colors are to what is being depicted. For example, is the sky blue, are the leaves green, etc. Harada et al. (2013) mentioned that older adults tend to think more concretely than younger adults. This may translate into a drawing that only depicts what has been asked, a person, an apple, and a tree. The colors used will likely only be those that are representational of those objects. However, older adults also begin to see through a yellowing filter as the lens of their eye ages (Besdine, 2020; Saxon et al., 2015). This will affect how an older person sees darker shades of color such as blues, greys, or greens. It is possible that an older person may use a non-representational color for an object simply because it is hard for them to tell the difference between color shades. While representational color is likely, which indicates strong scores on this scale, the chance to see some mistakes here and there is a possibility.

Implied Energy. This scale approximates how much effort the person put into the drawing to create it. Saxon et al. (2015) demonstrated how the joints of the elderly become less flexible with age. This lack of flexibility may translate into less movement on the page, which may appear as less implied energy in the drawing.

Space. This scale observes the amount of space used on the paper for the drawing. The same effects are suspected as previously mentioned. A lack of flexibility may encourage less movement on the page which may mean less space used in the drawing.

Integration. Integration refers to how the elements of the drawing come together to create a more cohesive composition in the art. Gantt & Tabone (1998) explain that proper integration of the asked for objects and their relationship with one another requires abstract thinking and spatial organization. Harada et al. (2013) note that executive

functions such as abstract thinking begin to decline with age. Furthermore, they mention that their visual construction skills also decline, which is the ability to take pieces of something and form them into a whole object. These cognitive abilities seem essential to the scale of integration, suggesting a lower score on this scale.

Logic. The scale of Logic measures how many bizarre or illogical elements exist in the drawing. Referring to the tendency for older adults to think more concretely (Harada et al., 2013), it makes sense that their drawings would likely be free of bizarre elements that are unclear to the reader. The score for this scale is expected to be high.

Realism. Realism refers to how realistic the elements of the drawing appear. The overall decreases in spatial ability and executive functioning mentioned previously by Harada et al. (2013) are likely to affect most attempts at realism in an artwork. The only exception suspected would be if the client had sufficient prior art experience, where their strong procedural memory would guide their drawing. This scale may depend on the individual, but when considering the normal expectations of this group, this scale is likely to rate low.

Problem Solving. This scale examines how the artist solved the dilemma asked of them, mainly, if the person successfully picked the apple from the tree. The decline in executive functioning, which impacts planning, abstract thinking, and mental flexibility (Harada et al., 2013), is likely to affect an older adult's problem-solving abilities. This scale may rate lower than younger adult PPAT drawings.

Developmental Level. This scale compares the drawing made to the various stages of graphic development that occur primarily through childhood. The aging brain begins to regress with age in the same pattern as it developed during adolescence (Saxon et al.,

2015; Wnuk, 2019). This would lead one to expect that the older someone is, the more likely their drawings may regress and demonstrate a lower development level. However, older adults may carry with them as they age their skills and experience stemming from procedural, semantic, and episodic memory. The effects of these influences and their regressing brain on a PPAT drawing are unknown.

Details of Objects & Environment. This scale discerns how many additional details there are in the drawing. Older adults think more concretely than adults (Harada et al., 2013). This is suspected to result in fewer additional details than what is asked for by the researcher. Lower scores on this scale are expected.

Line Quality. Line quality refers to how much control the artist had over the lines they created. The changes to the muscle and bone in an aging body are likely to affect the control and quality of the lines in an artwork. Besdine (2020) states that the bones near the wrist are especially susceptible to degeneration from aging. The physical factors of the aging musculoskeletal system are likely to produce lower scores on this scale.

Person. The Person scale examines how graphically developed the drawn person is in the image. A high score on this scale requires the drawer to depict a three-dimensional person instead of a stick figure (Gantt & Tabone, 1998). The IOM (2015) gave a clear example of how aging adults begin to struggle with perceiving three-dimensionality in drawings. A middle score on this scale, which is essentially a stick figure, may be expected.

Rotation. Rotation measures the amount of tilting shown in either the tree or the person of the drawing. Gantt & Tabone (1998) state that this scale and the next relate to constructional challenges that may be seen in those with organic mental disorders. While

normative clients are without a disorder, older adults still struggle with visual construction skills more than adults (Harada et al., 2013). An almost perfect or middle score might be expected from this population.

Perseveration. The Perseveration scale examines marks that were made outside of conscious awareness, either through motor control or unintended repeated features in the art. Aside from the constructional challenges in this scale, Gantt & Tabone (1998) also relate this scale to the frontal lobe and developmental disorders. While without a disorder, the brains of older adults are regressing as they age (Saxon et al., 2015; Wnuk, 2019). The prefrontal cortex, which is a part of the frontal lobe, is one part of the brain that is most affected by this regression. It is uncertain if a healthy older adult would show perseveration in their drawing, but the chance for perseveration to be a normative response in older drawings is not impossible.

To restate, the research question being answered is: "Do PPAT drawings made by normative adults ages 70 and older, when scored using the FEATS, diverge from expected scores compared to PPAT drawings made by normative adults ages 55 or younger." This question applies to each scale of the FEATS, and while it may be accepted or rejected by each individual scale, if at least one scale of the FEATS proves to be statistically different between the two groups being assessed, this would result in an accepted alternative hypothesis. For reference, the null hypothesis of this study is: "PPAT drawings made by normative adults ages 70 and older, when scored using the FEATS, *do not* diverge from expected scores compared to PPAT drawings made by normative adults ages 55 or younger."

Covariates

Since the Clock Drawing Task (CDT) is an assessment that observes cognitive ability, and education was found to be a significant factor in all the aforementioned CDT studies, it is likely that the level of educational attainment will influence an elderly person's performance on a PPAT assessment. Many of the PPAT scores mentioned previously are influenced by an older person's cognitive abilities. Should cognitive ability be preserved through education, it is likely a researcher will see an increase in multiple scores.

Exercise is proven to not only preserve the aging body but to keep the aging mind healthy as well (Herold et al., 2019). Physical exercise could offer the same benefits as higher education, or it could offer its own improvements on PPAT scales that may be more impacted by physical changes such as line quality. Its effects on the PPAT scores are uncertain, which makes it a great area to probe for research purposes.

Finally, many PPAT differences mentioned above could be impacted by someone who practices art regularly. Asking for any previous art experience may help to clarify any outliers that might be an exception to the normative data being collected.

Conclusion

The normative developmental effects of aging impact older adults in a myriad of cognitive and physical ways. Older adults tend to experience a decline in fluid cognitive abilities such as but not limited to processing speed, selective and divided attention, multiple forms of memory, language recall, mental flexibility, and spatial perception. Cognitive abilities that are more static such as sustained attention, word comprehension, and knowledgeable information tend to persist. The brain begins to regress, and certain areas start to atrophy more than others which may account for these cognitive challenges. Vision and hearing decline, and so does muscle and bone mass. Preventative measures to reduce the effects of natural aging seem to

include adequate exercise and cognitive stimulation. Due to these changes, this researcher hypothesizes that many of the Formal Elements Art Therapy Scale (FEATS) scores of Person Picking an Apple from a Tree (PPAT) drawing from older adults will be lower than those PPAT drawings made from younger and middle-aged adults.

CHAPTER III

Methodology

Overview

This study utilized a quantitative, cross-sectional, observational research design. An experimental variable was not manipulated in this study. To explore the potential change in graphic features of the aging person, two groups were established. The independent variable that differentiates the two groups are the ages of the participants, because along with their ages come the developmental nuances of that age group. The dependent variable under observation are the 14 individual Formal Elements of Art Therapy Scale (FEATS) scores of the Person Picking an Apple from a Tree (PPAT) assessment. Each member of each group was asked to complete a participant survey (See Appendix A) and the PPAT assessment. The drawings of each group were analyzed and compared using the FEATS scoring method. Scores were reviewed by 2 board certified art therapists (ATR-BC) to ensure accuracy and non-bias of the scores. Statistical analysis of these scores included the minimum and maximum score of each scale for each group, the mean of scores for each group, the standard deviation of scores within each group, and regression models to explore the effects of a few noted threats to internal validity that were accounted for in the study. The hypothesis for each FEATS score was either accepted or rejected by comparing the standard deviations of each score within each group to the same score of the other group and noting how much overlap there was between their deviations if there was any. If the two groups' deviations differed enough statistically, the change was then attributed to the variable of age and the corresponding developmental changes that occur with aging.

Inclusion and Exclusion

Participants of this study in each group met 3 inclusion criteria, 1) they were between the ages of 18-55 or 70 and older, 2) they do not currently have a mental health diagnosis, an intellectual or developmental disorder, are currently in or seeking therapy, or are taking any psychotropic medications, and 3) they do not have a physical disability that may affect drawing capability. Criteria 1 makes sure the participant is the correct age for the developmental stages being studied. Criteria 2 is to ensure that the drawings collected are those of a normative population and are not the product of any cognitive or emotional disorder. Criteria 3 prevents a physical disability from influencing the data. For example, if a client has hand tremors, the resulting marks of their drawing will no longer be representative of a normative drawing but that of someone with hand tremors. For this reason, some potential participants with physical disabilities may not be eligible to participate. These 3 criteria are assessed for in the first three questions of the required participant survey distributed before the commencement of the PPAT drawing (See Appendix A).

The ages of 56 through 69 were excluded from the study. This is because throughout the literature, these ages seem to encompass the transitional gap between the two distinct developmental stages of adult and older adult. This study was designed to examine the differences of graphic features between these two developmental stages. The inclusion of drawings from those aged 56 to 69 may further confound any differences that may be noticeable between one developmental stage to another, thus they were excluded from the study. Children ages 17 and younger were excluded from the study because these ages and corresponding developmental stages are not the focus of this study.

Recruitment

Homogenous and snowball sampling methods were the primary recruitment strategies utilized in this study. Homogenous sampling is purposefully seeking out people with a particular characteristic in mind, in this case the person's age. Snowball sampling is where the participants of a study recommend other potential participants. A recruitment flyer which introduces and describes the study was created to assist with reaching out to potential subjects (See Appendix B). Participants were either contacted directly by the researcher in a public setting, or a site of interest was contacted via email to gain permission to collect data from their residents. A general script of the personal interactions between the researcher and strangers was devised to provide a guideline for the researcher, to aid in the replicability of this study, and to satisfy the requirements of the institutional review board of Saint Mary of the Woods College which overlooks the safety of human subjects (See Appendix C). An email script was also devised for the same reason (See Appendix D).

Sample Size and Characteristics

The intended goal for the number of participants in this study was 25+ participants in both the 18-55 and 70+ age groups, amounting to at least 50 PPAT drawings. Aside from the inclusion and exclusion criteria, other demographic information was collected to statistically control for expected threats to the internal validity of this study. Questions 4-9 on the participant survey (See Appendix A) ask about ethnicity, gender, education level, amount of exercise, art experience, and mood. Ethnicity and gender are inquired about to observe their relation in the sample. Education level, exercise, and art experience are expected to impact the features of the PPAT drawings. Their effect will be measured using linear regression. The outcome of these effects and what they imply will be considered in relation to the overall results of this study. Mood is measured to ensure that most drawings in the sample were made in an average state of

mind and not affected by emotional outliers. A study by Veenhoven, 1993 (as cited in Bucciarelli, 2011) demonstrated that on a 10-point Likert scale, healthy people usually rated their neutral subjective sense of well-being anywhere from a 6 to an 8. The survey provided to participants in this study (See Appendix A) asks participants to rate their current mood in the same way, on a scale from 1 to 10. The intent behind this question is to take respondents' scores from a single group and average them to see if that average will equal somewhere between 6 and 8. If the average for that group falls between 6 and 8, it signifies that those groups drawings exemplify drawings made in a typical mood and that, overall, that group's scores are not influenced by overly positive or negative emotions and should reflect the average or expected scores of that population.

Data Collection Procedure

Interested participants were first asked to read through the consent form that has been approved for the use of this study (See Appendix E). The consent form provides both a summarization of the key features of the study along with more descriptive details of each feature. Voluntary participation, use of the data, and contact information are outlined along these features. Consent for all aspects data collection, such as survey information and the collection of the PPAT drawing, are encompassed through this form. After the participant agreed to consent by signing the form, they were provided a blank copy of the consent form for their own records.

Participants were then asked to fill out a 9-question survey (See Appendix A) that serves as the inclusion requirements screening tool. Questions 1-3 of the survey specifically ask about the inclusion criteria and must be answered if the participant chooses to fully participate. The survey also asks about demographic and covariate information as described previously. These are introduced in questions 4-9 of the survey and are optional. Upon completion of the survey,

this researcher checked to see if the inclusion criteria were met. If they were not met, this researcher then informed the participant that they did not qualify for the study, and that data collection would cease. If the inclusion criteria were met, the next step of the study would commence.

The participant was then provided with a white sheet of 12" x 18" paper and a pack of Sanford "Mr. Sketch" scented markers which contained felt-tip markers of 12 colors: Black, Red, Blue, Green, Yellow, Brown, Purple, and Orange, Pink, Turquoise, Magenta, and Dark Green. The participant was asked to identify the color of the 12 markers. This was to check for and eliminate any visual ambiguity between the 12 colors, such as between pink and magenta for example. If the participant made a mistake identifying a color, they were simply corrected. A scrap piece of paper was supplied so spare marks could be made with the markers before or during the PPAT drawing.

The participant was then asked to "Draw a person picking an apple from a tree" and allowed to create the drawing. The drawing of the artwork was expected to take 5-10 minutes but could have taken longer. Participants did not have a time limit for this task. When participants finished the drawing, this researcher then collected the artwork and all the materials used for the drawing. This concluded the data collection procedure and the participant's involvement in the research study.

Quality of Measurements

To ensure the quality and accuracy of the raw data gathered from the PPAT drawings, this study incorporated 2 board-certified art therapists (ATR-BC) to review the scoring performed by the student author of this paper. Once data collection concluded, this researcher then individually scored every PPAT drawing on each of the 14 scales of the FEATS. This

researcher followed the descriptions of each scales unit score as listed in the original FEATS manual written by Gantt & Tabone (1998). This stage of initial scoring was to reduce the workload of the reviewers. Once all PPATs were scored, all drawings and their scores were given to each of the ATR-BCs who had agreed to review the scores assigned to each PPAT drawing to suggest any edits if they were needed. Scores of the drawings were edited based on the outcome of the collaborative discussion of each contested score between this researcher and each ATR-BC.

Statistical Analysis

To test the hypothesis of each scale of the FEATS, the minimum score, maximum score, and the average score of each scale for each of the 2 groups were delineated. This allowed the researcher to observe the standard deviations of each scale within each group. Each group's standard deviation pattern for that scale was compared to the other group and the probability for the difference between the 2 groups would then be calculated if each group's scores resided outside of each other's standard deviation. If it was unlikely that the average difference in scores occurred by chance, the difference would then be attributed to the changes in developmental capabilities, thus supporting or rejecting the hypothesis of each scale. The assessment of each of these scales also provided the information needed to answer the research question proposed for this study.

Additional analysis of the covariates through linear regression revealed how much of each of the expected factors influenced the participants scores. The factors in question included education level, amount of exercise, and art experience. The purpose of this step was to observe if these factors were significant or not in affecting the overall group scores. It is possible that education level and exercise may have preserved cognitive health and reduced the aging effects

on the brain to the point that this element must be considered when observing advancing human development. Checking for the influence of art experience was also helpful in determining how much it can influence the scales of the FEATS and in what way. While the direct comparison of FEATS scores may have informed us *if* advancing development influences the graphic features of an artwork, analyzing the covariates listed here has provided us some clues as to *what* influences those changes in scores.

CHAPTER IV

Results

Participants

The goal number of participants in this study was 50 participants in both the 18-55 and 70+ age groups. The actual number of subjects who participated in this study was N = 48, where n = 24 of the 18-55 group, and n = 24 of the 70+ group. Participants were directly recruited in person at various locations across Tucson and Green Valley, Arizona. Sites of collection included both public settings like church group gatherings, vacation resorts, and vendor markets, along with private settings such as home visits. Participant data was collected between the dates of August 12th, 2023, and September 30th, 2023. No payments or benefits were provided to the participants due to their participation in this study.

Participants wrote-in their self-proclaimed race/ethnicity and gender on the provided survey. For the sake of condensing categories of race and ethnicity, similar demographic groups were combined under one larger encompassing category. For example, those participants labeled as “Hispanic” included the write-in responses of: “Hispanic,” “Latino,” “Latino/a, Mexican American” and “Mexican-American.” Table 1 lists the frequency and percentages of each participants racial/ethnic category, along with what write in responses each category consists of, in both groups separately and combined. The information from this table denotes that the majority of participants for this study were White (N=27) and Female (N= 28), with more racial/ethnic diversity in the younger age 18-55 group than the age 70+ group. Similarly, Table 2 lists the frequency and percentages of genders of each group as well as combined.

Table 1

Frequencies, percentages, and write-in responses of racial/ethnic categories

Race/Ethnic Category	Number of participants in each group (Percentage of participants in that group)			Write-in responses in each category
	Combined Group	Group 18-55	Group 70+	
-	5 (10.4%)	2 (8.3%)	3 (12.5%)	-
Black	1 (2.1%)	0 (0%)	1 (4.2%)	"Considered African American"
Hispanic	8 (16.7%)	8 (33.3%)	0 (0%)	"Hispanic"; "Latino"; "Latino/a, Mexican American"; "Mexican-American"
Native American	3 (6.3%)	2 (8.3%)	1 (4.2%)	"Native American"; "American Indian"
White	27 (56.3%)	8 (33.3%)	19 (79.2%)	"White"; "English-White"; "Caucasian"; "Caucasian-non Hispanic"; "Pink"
White/Hispanic	4 (8.3%)	4 (16.7%)	0 (0%)	"White/Hispanic"; "White/Latino"; "White Mexican"; "Puerto Rican, Portuguese, and Irish"

Note. The "Combined Group" category consists of all participants in both "Group 18-55," and "Group 70+." The "-" indicates an unfilled/empty response.

Table 2

Frequencies and percentages of each gender category

Gender Category	Number of participants in each group (Percentage of participants in that group)		
	Combined Group	Group 18-55	Group 70+
-	3 (6.3%)	1 (4.2%)	2 (8.3%)
Female	28 (58.3%)	14 (58.3%)	14 (58.3%)
Male	16 (33.3%)	8 (33.3%)	8 (33.3%)
Nonbinary	1 (2.1%)	1 (4.2%)	0 (0%)

Note. The "Combined Group" category consists of all participants in both "Group 18-55," and "Group 70+." The "-" indicates an unfilled/empty response.

The mean reported mood in the age 18-55 group was 7.83, while in the age 70+ group the mean was 8.96. Veenhoven, 1993 (as cited in Bucciarelli, 2011) was previously mentioned

stating that the average neutral mood score of healthy adults resides between a score of 6-8. Since the mean mood score of the first group falls within this range, it is assumed that this group's drawings should not have strong negative or positive emotional influences on the artwork, and that the art can be expected to reflect the expected result of this group's age range. The mean of the second group's mood score residing above the neutral threshold infers that these drawings may be slightly influenced by positive emotionality. This may reflect a potentially small increase of certain FEATS scores, though to what extent is uncertain. Gantt & Tabone (1998) describe that those people in the effect of bipolar mania create art with many colors, use extra space, add additional details, and contain swooping lines, affecting FEATS scores such as Prominence of Color, Color Fit, Implied Energy, Space, Details of Objects and the Environment, Line Quality, and Problem Solving. While none of the participants in this study exhibit manic symptoms, these are the scores most likely to be influenced by a positive heightened emotional state.

Statistical Analysis

FEATS scores

The mean, standard deviation, range, minimum score, and max score for each FEATS scale in each group were calculated. The bar graph shown in Figure 1 shows the mean score of each FEATS scale for each group and may be the easiest way to compare the similarity between scores. Both groups scored very similarly in each FEATS scale with the largest mean difference in the scales of Problem Solving by about half a point, and in Integration and Realism by about a quarter point. Table 3 provides the exact numbers of all calculated indices for the first group of 18–55-year-olds. Table 4 shows the same calculations for the second group of those age 70+.

Figure 1

A bar graph showing the mean of each FEATS scores in Group 18-55 and Group 70+

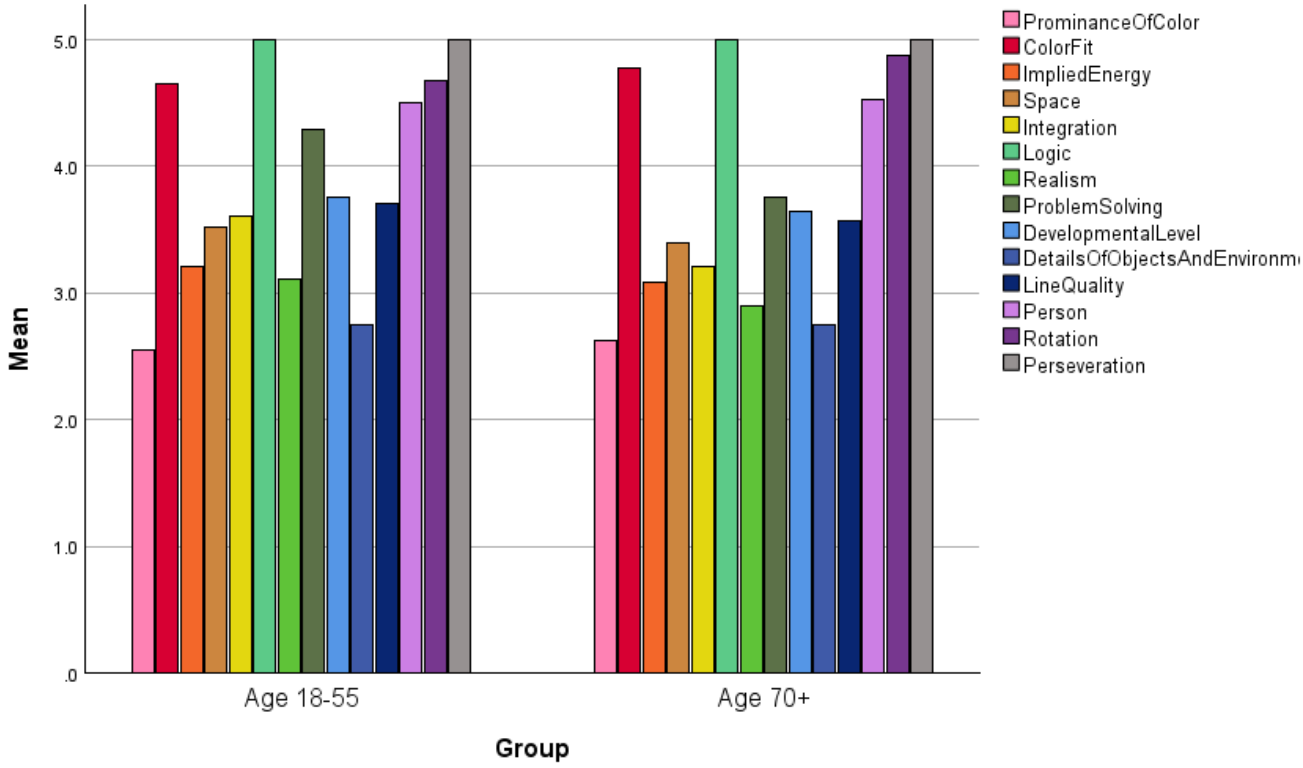

Table 3

The mean, standard deviation, range, minimum score, and max score for each FEATS scale in Group 18-55

	PromC	C.Fit	ImpE	Space	Integ	Logic	Real	ProbS	DevLv	DofOE	LineQ	Person	Rotat	Persev
Mean	2.542	4.646	3.208	3.521	3.604	5.000	3.104	4.292	3.750	2.750	3.708	4.500	4.667	5.000
Std. Deviation	.8836	.4539	.6580	1.0371	.5706	.0000	.6423	1.1602	.4663	.8470	.4872	.5710	.4584	.0000
Range	3.0	1.0	3.0	3.0	2.0	.0	3.0	4.0	2.0	3.5	2.0	2.0	1.0	.0
Minimum	1.0	4.0	2.0	2.0	3.0	5.0	2.0	1.0	3.0	1.0	3.0	3.0	4.0	5.0
Maximum	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0

Note. N=24. PromC = Prominence of Color; C.Fit = Color Fit; ImpE = Implied Energy; Integ = Integration; Real = Realism; ProbS = Problem Solving; DevLv = Developmental Level; DofOE = Detials of Objects and Environment; LineQ = Line Quality; Rotat = Rotation; Persev = Perseveration.

Table 4

The mean, standard deviation, range, minimum score, and max score for each FEATS scale in Group 70+

	PromC	C.Fit	ImpE	Space	Integ	Logic	Real	ProbS	DevLv	DofOE	LineQ	Person	Rotat	Persev
Mean	2.625	4.771	3.083	3.396	3.208	5.000	2.896	3.750	3.646	2.750	3.563	4.521	4.875	5.000
Std. Deviation	.7837	.4165	.6703	1.0213	.6413	.0000	.5706	1.4295	.5209	.9208	.4959	.6833	.3040	.0000
Range	3.0	1.0	3.0	4.0	2.0	.0	2.0	4.0	2.5	3.5	2.0	2.0	1.0	.0
Minimum	1.0	4.0	2.0	1.0	2.0	5.0	2.0	1.0	2.5	1.5	2.0	3.0	4.0	5.0
Maximum	4.0	5.0	5.0	5.0	4.0	5.0	4.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0

Note. N=24. PromC = Prominence of Color; C.Fit = Color Fit; ImpE = Implied Energy; Integ = Integration; Real = Realism; ProbS = Problem Solving; DevLv = Developmental Level; DofOE = Detials of Objects and Environment; LineQ = Line Quality; Rotat = Rotation; Persev = Perseveration.

All scores for each group happen to be within the range of standard deviation for the other group. For example, the mean of Problem Solving for the 18-55 group was 4.292 and the standard deviation in that scale was 1.1602 points. Likewise, the mean for Problem Solving in the 70+ group was 3.75 with the standard deviation of 1.4295. The first group's mean of 4.292 is closer to the second group's mean of 3.75 than both groups' set of standard deviations. This comparison of each group's mean score in each scale in relation to their standard deviations shows the same pattern. Furthermore, the scales of Logic and Perseveration were the same in each group with every drawing scoring a 5 on each scale. All the FEATS scores in each of the two groups are so similar that there is not a statistically significant difference between them.

The intent of this study was to first observe which FEATS scores in the age 70+ group deviated from the other group's scores. Then the P-value, or probability of that difference happening by chance, would have been calculated to either support or oppose the null hypothesis tested in this study. None of the scores deviated enough from the other group's scores to warrant

calculating a p-value for any score. The scores of each group are statistically the same and the margin of error between each group's scores is attributed to chance based on this study's random sample.

Analysis Using Linear Regression

Linear regression was used to check how well the covariates surveyed for in this study, which were education level, amount of exercise, and art making experience, predicted the scores found of each scale of the FEATS. The relation of each of these covariates to each FEATS scale is demonstrated with an R-value, which measures the closeness of association between two variables. Table 5 presents the resulting R-value of each cross-section of all covariates and all FEATS scores for both groups combined and each group individually.

Table 5

The R-value for each FEATS scale in relation to education level, exercise amount, and art experience

Combined Group	PromC	C.Fit	ImpE	Space	Integ	Logic	Real	ProbS	DevLv	DofOE	LineQ	Person	Rotat	Persev
Education	0.061	0.004	0.003	0.054	0.028	N/A	0.079	0.035	0.004	0.064	0.223	0.057	0.076	N/A
Exercise	0.137	0.021	0.07	0.028	0.118	N/A	0.071	0.094	0.078	0.112	0.192	0.069	0.346	N/A
Art Exp	0.09	0.046	0.247	0.07	0.172	N/A	0.125	0.055	0.272	0.118	0.154	0.183	0.014	N/A
Group 18-55	PromC	C.Fit	ImpE	Space	Integ	Logic	Real	ProbS	DevLv	DofOE	LineQ	Person	Rotat	Persev
Education	0.153	0.184	0.145	0.17	0.079	N/A	0.098	0.319	0.09	0.178	0.231	0.137	0.073	N/A
Exercise	0.124	0.015	0.313	0.145	0.17	N/A	0.029	0.101	0.148	0.022	0.231	0.043	0.263	N/A
Art Exp	0.146	0.459	0.209	0.216	0.178	N/A	0.233	0.117	0.3	0.138	0.389	0.135	0.385	N/A
Group 70+	PromC	C.Fit	ImpE	Space	Integ	Logic	Real	ProbS	DevLv	DofOE	LineQ	Person	Rotat	Persev
Education	0.036	0.156	0.1	0.334	0.293	N/A	0.129	0.485	0.238	0.038	0.095	0.289	0.082	N/A
Exercise	0.215	0.035	0.116	0.041	0.317	N/A	0.065	0.408	0.04	0.192	0.035	0.051	0.336	N/A
Art Exp	0.045	0.478	0.274	0.052	0.167	N/A	0.025	0.005	0.25	0.103	0.038	0.223	0.476	N/A

Note. The "Combined Group" category consists of all participants in both "Group 18-55," and "Group 70+." Art Exp= Art Experience, PromC = Prominence of Color; C.Fit = Color Fit; ImpE = Implied Energy; Integ = Integration; Real = Realism; ProbS = Problem Solving; DevLv = Developmental Level; DofOE = Detials of Objects and Environment; LineQ = Line Quality; Rotat = Rotation; Persev = Perseveration.

The combined group R-values may be a more accurate representation of any patterns that can be delineated from these sets of values because of the additional data points used for these values. LaMorte (2021) describes the strengths of R-values as 0.0-.0.2 as a very weak association or possibly no association, 0.2-0.4 as a weak association, and 0.4-0.6 as a moderate level association. All R-values derived from this study are below 0.5 with the majority of them being below 0.2. However, some information can still be obtained from the associations that are present. For example, the influence of having some prior art experience seems to impact the scores of Implied Energy and Developmental Level a fair amount in each group category. It would make sense that the more art experience one has, the more effort they would put into the task and the more advanced their drawing may be. An interesting association seems to be the link between exercise and the Rotation scale. Rotation is the amount of tilting of an object in relation to an imaginary vertical axis. Those who exercised less tended to have tilted elements in their drawing more often. Looking at the groups individually, some associations are understandable while the impact of others are less certain. Education level being the strongest predictor of a high Problem Solving score in the age 18-55 group might have been assumed without this information, but a more frequent exercise amount strongly influencing the Prominence of Color scale for the 70+ group would have been less predictable. As a cautionary notice, there were some limited data points of certain levels of Education and Exercise in the older age group which may be affecting the results. There was only 1 participant in the age 70+ group that claimed to have a high-school education or less, and only one participant in this group marked “Once a week or less” for exercise. The younger age group had a more balanced distribution of each level of each category.

CHAPTER V

Discussion

Research Question

The research question this study aimed to answer was "Do PPAT drawings made by normative adults ages 70 and older, when scored using the FEATS, diverge from expected scores compared to PPAT drawings made by normative adults ages 55 or younger." The null hypothesis in this case would state that the FEATS scores of the age 70+ group would not diverge from expected scores of the younger adults. The alternative hypothesis would state that they do in fact diverge from the scores of younger adults. Considering the results of this study, the alternative hypothesis cannot be supported, and the null hypothesis remains undisputed.

Research Evaluation

The FEATS scores of the age 70+ group being the same, at least statistically, as the age 18-55 group is a substantive finding in this study. While a significant difference of scores was not found, this study may be one of the first to characterize and illustrate in objective terms the *manner* in which adults ages 70 and older tend to draw. This study suggests that despite the developmental changes that occur in the body and brain with advanced age, older adults retain their previously attained level of graphic development. Furthermore, the physical and mental changes that occur with aging do not seem profound or unique enough to generate a new or undiscovered graphic developmental stage that art therapists would need to consider.

The R-values obtained from the regression analysis are also a valuable addition to the sparse research that describes some of the factors which influence a PPAT drawing. For example, Bucciarelli (2011) assessed 100 PPAT drawings made by college students and related some patterns of PPAT scores to gender, race, and art experience. Interestingly, she notes that

participants with more art experience scored higher on the Rotation scale than those with less experience. The R-values in this study in both the younger age and the older age group support her observations. This study did not attempt to use race or gender in regression analysis because of the limited numbers of some categories from the sample that was collected. For example, across both groups of this study there was only 1 Black participant, 3 Native American participants, and 4 in the category of White/Hispanic. As noted previously, having too few data points in a category may produce unreliable results. Regression analysis could have been additionally divided by male and female participants, though as was the case with the older group having an uneven distribution of certain levels of covariates, dividing up this small data set even further may have produced more unbalances. The assessment of different levels of education and amounts of exercise are, so far, not found in any other study assessing normative PPAT drawings. The R-values found in this study under those categories may become a starting point for future researchers to investigate even further.

The FEATS scores of this study are one example of what normative scores in younger and older adults may look like. Although there was a total of N=48 for this study, each group consisted of only N=24 which is a much smaller sample for a statistical study. Considering though that this study is looking for a level of change noticeable enough to influence FEATS scores, N=24 may have sufficed very well in this role. An editorial by Hackshaw (2008) explains that for studies that compare two or more groups, “The smaller the true-effect size, the larger the study needs to be” (p. 1141). What is meant by this is that if the true differences in FEATS scores between adults ages 18-55 and adults ages 70 and older was very small, perhaps a quarter point or less on the FEATS scale, this study would need to be much larger to account for that. Such a close difference on the FEATS however essentially yields the same results in clinical uses

of the PPAT. If the true difference between these groups were much larger, say a full point or more on the FEATS, this difference would be much more noticeable in smaller studies such as this one, and a larger difference between groups *would* make an impact clinically. What we may conclude from this small study is that there is likely not a difference between these groups that is meaningfully impactful to the uses of the PPAT. If a small difference between groups did in fact exist, a much larger study would be needed. While a larger group then becomes essential to truly finding the influences of advancing age on graphic development, it becomes unessential in the clinical sense of using the PPAT for assessment.

As far as the similarity of FEATS scores between what was found in this study and another source of normative PPAT data, the results match moderately well. Bucciarelli (2011) is the best example of a large normative PPAT study, and she similarly has listed all her FEATS scores means and standard deviations in her article. All her PPAT drawings were done by college students ages 18-24, so the best fair comparison would be against this study's 18-55 group. Her standard deviations tend to be less than or approximately match the deviations found in this study with the only exceptions being Developmental Level, and Logic and Perseveration for a different reason. Her study's standard deviation for Developmental Level was 0.57, compared to 0.46 found in this study for the younger group. It is interesting that Bucciarelli (2011) had more deviation on this scale when her participants were of a much smaller age gap. Furthermore, in her study she had some variations of Logic and Perseveration. In this study, all participants scored a 5 on both scales, creating no variation or deviation difference. Apparently in her 100-person sample, Bucciarelli (2011) encountered a Perseveration score as low as 3, and a Logic score as low as 2. Her means for these scales are very close to 5, suggesting that a score lower than 5 on a normative PPAT is rare but can still be apparent. As far as the means of individual

scores are concerned, all are within 0.4 of each other between studies except for Prominence of Color and Details of Objects and Environment. Bucciarelli (2011) had a mean of 3.14 and 3.46 for these scores, respectfully. This study encountered a mean of 2.54 for Prominence of Color and 2.75 for Details of Objects and Environment for the younger group. While more pronounced, these differences could simply be attributed to the difference in sample sizes in each study, as is certain the case for the smaller standard deviations of each scale in the other study.

Generalizability

The direct approach used to recruit participants was primarily a convenience sample of the people this author knew and extended via snowball sampling. As such, this selection of participants was not expected to match the U.S census. However, there is a surprising similarity between some of the racial and ethnic population percentages of the U.S census compared to the 5 racial categories organized in this study. The United States Census Bureau (n.d.) reports these population estimate percentages for the 2022 year; only the categories that match this study's groupings are shown:

- White alone, 75.5%
- White alone, not Hispanic or Latino, 58.9%
- Hispanic or Latino, 19.1%
- American Indian or Alaska Native alone, 1.3%
- Black or African American alone, 13.6%

Notice the "White alone" and "White alone, not Hispanic or Latino" percentages make over 100% of respondents. "White alone" includes those who labeled themselves "White" without an ethnicity *and* with an ethnicity. If 58.9% of those respondents did not have an ethnicity, then 16.6% of them did, which would equate to this study's "White/Hispanic" category. Refer to

Table 1 to directly compare percentages between this study and the U.S Census Bureau. The percentages of "White" and "Hispanic" categories are very close to the U.S census percentages. While there were only 3 "Native American" participants which equates to 6.3% of respondents, this makes them overly represented in this study. The "White/Hispanic" participants only represent about half of the U.S census percentage of this group. The "Black" racial category is underrepresented.

The 2 largest racial categories in this study, "White" and "Hispanic," make up about 73% of total participants. This 73% most closely matches the population estimate percentages found in the United States. Overall, the data suggests that the results of this study should be moderately generalizable to the larger population, with perhaps the exception of one detail. The age 70+ group is overrepresented in "White" participants, making up 79.2% of that group. Any researcher or clinician who makes use of the information herein should be aware that these results may be less applicable to minority adults ages 70 and older.

As a quick mention, The United States Census Bureau (n.d.) estimated the U.S female population to be 50.4%. They assess only the person's biological sex, meaning the male population is implied at approximately 49.6% This study has a slight overrepresentation of females at 58.3% and males are underrepresented at 33.3%. Despite these differences, the position of results being "moderately generalizable" remains.

Limitations

An acknowledged weakness of the direct approach utilized in this study was the inability to completely control the environment of which participant data was collected. The ideal setting for data collection would've been in a non-distracting or familiar room alone with the participant, well lit, quiet, properly seated, and in the middle of the day. In public settings, the

best efforts were made to provide enough privacy for the task, to minimize distractions, and to collect drawings at an appropriate time of day. When possible, the ideal data collection environment was recreated. In private venues, primarily house visits, the ideal data collection environment was easier to recreate.

Another challenge this researcher encountered was the time some participants allowed to complete the task. Occasionally, participants would schedule to do the drawing before or right after work, an appointment, a class, etc. There was no time limit provided to participants from within the study, but participants were sometimes pressured by external influences to finish the task before their next obligation. At times, this researcher noticed in these cases that participants would sometimes rush the ending of their drawing, or even finish and say something along the lines of "I would add more if I didn't need to do (whatever they had to do)." This researcher attempted to avoid any conflicts of scheduling once the trend became apparent very early on, so the effects of rushed or incomplete artwork were minimized.

While the data presented matches similar studies, is generalizable, and is perceived to have suitable results for a study of this size, a summary of the factors influencing the imprecision of the results and their uses feels in order. As mentioned, a few drawings were rushed partly or admittedly cut short. The mood of the age 70+ group was slightly elevated, perhaps raising some of the FEATS scores that are more influenced by emotionality. To what extent exactly is uncertain. The sample sizes for each group are small for a statistical study, though to the effect of what the data is measuring, they should suffice. The data is not completely representative of the U.S population. Black or African American people are almost not represented, let alone the other races and ethnic groups that are literally not represented such as those in the Asian or Pacific Islander categories. The 70+ group consists primarily of White adults so the results may not be

applicable to older age minorities. The R-values for the same group are also more suspect seeing that “Education” and “Exercise” are relying on a single point of data for a particular level of each category. Finally, the R-values presented in this study, while enough to suggest some association between traits, are weak correlations and are not considered significant by a statistical standard.

Implications for Future Research

This research was very much inspired by the work of Bucciarelli (2011) in her study that examined 100 normative PPATS because a normative standard was missing in the literature. When the PPAT and the FEATS were originally created by Gantt & Tabone (1998), they stated the necessity of establishing a normative standard and suggested related research into the PPAT such as observing “Changes over the age span (a normative study by decades)” (p.61). This study sought to do just that, to examine the FEATS scores of the age span that needed additional research the most, those persons on the later end of human development. This researcher hopes that this study will also be an inspiration for the next researcher. That they will take some of the structure and ideas of this study and apply it to another study examining a different group or expanding on the population that was studied here.

There are various ways to take this research a step further. A larger sample size is generally always a benefit. Bucciarelli (2011) had found some associations of FEATS scores between race and gender. Gathering PPAT data of one specific minority group would be of great interest to the academic field. There is also the option to push the limits of this study even further. For example, would the developmental characteristics of advanced aging show up graphically in PPAT drawings made by 90-year-olds or older? One could also expand and specify the covariate levels. Will PhD holders show any differences in their PPAT drawings compared to those adults with a high school education? One could even do just as Gantt &

Tabone (1998) had suggested and do a much larger study divided into decades. Such a study would confirm what was found here and would help to elucidate exactly how the scales of the FEATS relate to the stages of younger development.

Interpreting the impact of this research in a clinical setting, art therapists can be assured that at least to the best of our knowledge now, a PPAT will have the same normative characteristics whether it was made by an 18-year-old or an 80-year-old. Knowing the expected normative FEATS scores of older adults can help to screen out those older adults who *do* in fact have some underlying mental health condition. This will help to improve the healthcare and overall wellbeing of one of the fastest growing age groups in America.

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APPENDIX A

SURVEY

- Questions 1-3 must be answered to participate in this study. A participant can choose to decline to answer these items, though this will exclude them from the study.
- Questions 4-9 are completely optional, and any responses provided are appreciated.

1. What is your age? _____

2. Do you currently have a mental health diagnosis, an intellectual or developmental disorder, are currently in or seeking therapy, or are taking any psychotropic medications? Please answer only "Yes" or "No."_____

3. Do you currently have any physical disability that may affect your drawing capability? Please answer only "Yes" or "No." _____

4. What is your ethnicity? Please write out your answer.

_____

5. What is your gender? Please write out your answer.

_____

6. What is your highest level of educational attainment? Please circle only one.

(Highschool or less) (Some College) (Bachelor's degree or more)

7. How frequently do you exercise? Both intense and mild exercise should be considered. Please circle only one.

(Not at all) (once a week or less) (more than once a week)

8. What is your experience level in making art? Please circle only one.

(No experience) (some experience) (A lot of experience).

9. How would you rate your current mood on a scale of 1 -10, with 1 being the most negative and 10 being the most positive? Please circle only one.

1 2 3 4 5 6 7 8 9 10

APPENDIX B
Recruitment Flyer

Research Opportunity, ***FEATS scores of the elderly using the PPAT assessment*** *– a study of advanced age graphic development!*

Adults **ages 18 to 55** or **ages 70 and above** may qualify!

*Additional requirements assessed through screening survey

The purpose of this research study is to examine if the **regular aging process impacts the visual features of an artwork.**

Participants will be asked to sign a **consent form,** fill out a **9-question survey**, and then be asked to **"Draw a person picking an apple from a tree."** That's it!

Your whole participation will **only take 5-15 minutes** and you will be benefiting the academic field of art therapy.

How can I participate?

To learn more about this research study, please call (520) 425-6464 or email the chief co-investigator Nickolas Garcia at nickgarcia1217@gmail.com.

All drawing images sourced from Gantt, L., & Tabone, C. (1998). *The formal elements art therapy scale: The rating manual.* Morgantown, WV:

An Institutional Review Board responsible for the safety of human subjects in research at Saint Mary-of-the-Woods College reviewed and approved this research study.

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APPENDIX C

Personal Interaction Recruitment Script

I imagine every interaction will be just a little different from the next, and for that reason this script is a general guideline of what I might say to those I interact with. My goal is to grab their interest, explain what it is I am doing, and emphasize how quick and easy the process of participation is. I imagine they may have questions which I will also script here.

General Pitch

"Hello, would you be interested in making a drawing for me?
I check to see if I have their attention
"I am a graduate student doing research in art therapy from Saint Mary-of-the-Woods College, and all I am doing is collecting a specific drawing and a survey from anyone who is willing to help. You don't have to be good at art to help, and the whole process can be finished right now in the next several minutes."
If I still have their attention, hand them the consent form to look at
"I am not grading your art, I am only researching *how* people draw at different ages. I am looking at the differences between adult drawings by those age 55 and younger, and those made by elderly adults ages 70 and older. Are you interested?"
By this point I expect questions. They are listed here

What is art therapy?

"Art therapy is a form of psychotherapy that uses the arts to help clients explore their mental health issues. It is not about the quality of the art, but more so about the process of making and how an art piece might reflect the issues a person is struggling with. The art will aid the client in therapy, and an art therapist is someone who is trained to use the arts with a client."

Where/What is Saint Mary-of-the-Woods College?

"Saint Mary-of-the-Woods College is located in Indiana. I live here in Tucson, Arizona, and I travel to the school at the start of every semester and do the rest of my work here. The college has approved the research I am conducting which is a requirement for my degree."
If necessary, I can point out the IRB information noted on the consent form for any approval or legitimacy concerns

What do I have to do?

"The whole process is simplified and written right here step-by-step."
I point to the Key Information box, Procedure and Duration on the consent form
"If you consent to participation, you sign this form, fill out a survey, and make a drawing for me. That's it."

Anyone can participate?

"Anyone between the ages of 18 and 55, or 70 and older, who don't currently have mental or physical concerns that make them ineligible to participate. I will review the survey that is filled out before the drawing to see for sure if you are eligible."
If they ask for specifics, I will show them the survey so they can see the details of eligibility. My check for inclusion criteria is the first 3 questions of the survey

For anything that involves **confidentiality, the use of information, risks/benefits, or purpose of the research**, I will point out these sections on the consent form and review it with them.

APPENDIX D

Email Permission and Recruitment Script and Format

Hello, _____

My name is Nickolas Garcia, and I am a graduate student researcher for Saint Mary-of-the-Woods College. I am an art therapy student looking for eligible participants to make a certain drawing for me. My research has been approved by the college, and I was hoping to obtain permission to meet some of your clients/members/residents in person to see if they are interested in helping me.

Participation in my research study is done in the same day, individually, and only takes about 5 to 15 minutes. I am only asking interested participants to sign a consent form, fill out a 9-question survey, and draw a "Person Picking an Apple from a Tree." I will provide the markers and paper for the drawing.

I would benefit from the participation of your clients/members/residents because I suspect many of them will meet the inclusion criteria for the two groups I am gathering data from. I am looking for people that:

1) Age range is either 18-55, or 70+
2) Do not currently have a mental health diagnosis, an intellectual or developmental disorder, are currently in or seeking therapy, or are taking any psychotropic medications.
3) Do not have a physical disability that may affect drawing capability.

I understand my request is sudden and you will want to know more about me and my research study before I may be allowed to meet anyone. I would be happy to discuss more over email or by phone at (520) 425-6464 about my intentions and would be very grateful should you offer me a chance by contacting me back. Thank you for your consideration and I hope to hear from you soon.

Sincerely,
Nickolas Garcia, Co-investigator

APPENDIX E

Saint Mary-of-the-Woods College
CONSENT TO PARTICIPATE IN RESEARCH

Title of the Research Study: **FEATS scores of the elderly using the PPAT assessment**
Principal Investigator: Elizabeth Markman MA, LCPC, ATR-BC, PhD
Co-investigator: Nickolas Garcia

You are being asked to participate in a research study about the graphic development of elderly adults ages 70 and older. Key information for you to consider is provided below. Please carefully consider this key information and read this entire form to obtain more detailed information about this research study. Please feel free to ask questions about any of the information before deciding whether to participate in this research project. Participating in this research project is voluntary.

Key Information

- **Purpose of the research study**: To examine if the regular aging process impacts the visual features of an artwork. This study will improve the utility of the PPAT assessment, may provide evidence of a late graphic developmental stage, and will improve therapy work with older adults when the use of artwork is considered.
- **Procedure and Duration:**
  - Estimated total duration of participation: **5-15 minutes.**
  - You will first be asked to sign this consent form.
  - You will then be asked to fill out a 9-question survey.
  - You will be provided with the needed art materials and be asked to identify the color of the 12 markers provided.
  - You will be asked to "Draw a person picking an apple from a tree."
  - When you are finished drawing, I will then collect the artwork and art materials. This concludes your participation in the study.
- **Risks and discomforts**: Minimal risk of becoming uncomfortable with the content of the survey or the drawing. The co-researcher will utilize strategies to assist with discomfort.
- **Benefits**: No direct benefits for participants.
- **Participation is completely voluntary.**

Purpose of the Research

The purpose of this study is to examine if the developmental changes that occur in the brain and the body from the regular aging process impact the graphic features that can be observed in an artwork. This study involves filling out a 9-question survey and completing a specific art therapy assessment, the "Person picking an Apple from a Tree" (PPAT). The PPAT will be utilized because of the assessment's quantitative scoring system known as the Formal Elements of Art Therapy Scale (FEATS). The information gleaned from this study will improve the validity and utility of the PPAT assessment and may provide evidence of a late graphic developmental stage not currently found in the literature. Knowledge of a late graphic developmental stage will improve therapy work with older adults when the use of artwork is considered. You are being

asked to participate because this study is a partial requirement of the class, AR591 – Thesis, for Nickolas Garcia, a Master of Arts in Art Therapy student at Saint Mary-of-the-Woods College.

Procedures

Estimated total duration of participation: **5-15 minutes.**

1. You will first be asked to sign this "CONSENT TO PARTICIPATE IN RESEARCH" form, which also includes consent to collect your survey and artwork.
2. You will then be asked to fill out a 9-question survey, which asks about the inclusion criteria for this study, demographic information, and information related to variables such as education, exercise, art making experience, and mood. I, Nickolas Garcia the researcher, will then collect the survey and check to see if the inclusion criteria are met. If it is not met, I will inform you that you do not qualify for the study, and we will not continue with data collection. If you meet inclusion criteria, the next step of the study will commence.
3. You will be provided with a white sheet of 12" x 18" paper and a pack of Sanford "Mr. Sketch" scented markers which contain 12 colors of felt-tip markers. You will be asked to identify the color of the 12 markers. This is to check for and eliminate any visual ambiguity between the colors. If you make a mistake identifying the color, I will correct you. I will have a scrap piece of paper handy so spare marks can be made with the markers before starting the drawing.
4. You will then be asked to "Draw a person picking an apple from a tree" on the 12"x18" paper provided. You will then complete the task. There is no time limit for this task.
5. When you are finished drawing, I will then collect the artwork and the materials used for the drawing. This will conclude your participation in the research study.

Risks or Discomforts

The procedure involves minimal risk for participants. However, anticipated possible risks include becoming uncomfortable or triggered by the content of the survey or drawing. To manage any discomforts or concerns, the co-researcher will utilize these strategies:

- Offer you to take a break from the research study and to resume when and if you become comfortable again.
- Initiate a "Square guided breathing" technique for grounding. 4 counts inhale, 4 counts hold, 4 counts exhale, 4 counts hold.
- While you are seated, initiate a body scan grounding technique. I will ask you to consider how your feet feel, shins feel, knees feel, etc. up to the head.
- If any one of these techniques is used, I will also remind you that **participation is voluntary** and if you would like you could choose to opt out of the research study with no penalty or consequences.

Potential Benefits

Though there are no direct benefits for participants, anticipated possible benefits include aiding the researcher and further benefiting the academic field of art therapy.

Confidentiality

Your contact information is not asked for to preserve the confidentiality of your responses and corresponding artwork. All forms and artwork received from participants will be stored in 1 of 2

locked boxes kept in an undisclosed location. Participants will not be able to view responses or artworks from other participants. A participant's consent form, survey responses, and artwork together will only be viewed by the Principal Investigator and the Co-investigators of this study. This data will be maintained for a period of three years in a secure locked box after publication of the results. The results of this study will be shared with participants, if requested, which may increase knowledge of art therapy and the effects of art therapy interventions.

Voluntary Participation

It is entirely voluntary to participate in this research study. You can decline participation in the study by not signing the consent form. You can withdraw from the study at any time without penalty by contacting the co-investigator, Nickolas Garcia, at Nickolas.Garcia@smwc.edu even if you decide to be part of the study now.

Use of Data for Future Study

Data that does not contain information directly identifying you could be used for future research studies or distributed to another investigator for future research studies without additional informed consent.

If you have questions about this research study, please contact the principal investigator or co-investigator.

Principal Investigator
Elizabeth Markman MA, LCPC, ATR-BC, PhD
Elizabeth.Markman@smwc.edu

Co-investigator
Nickolas Garcia
Nickolas.Garcia@smwc.edu

This study was approved by the Saint Mary-of-the-Woods College Human Subjects Institutional Review Board on August 4th, 2023. If you have questions or concerns about your rights as a research participant, you may contact the chair of the Human Subjects Institutional Review Board.

Chair, IRB
Dr. Lamprini Pantazi, Chair, Human Subjects Institutional Review Board
Saint Mary-of-the-Woods College
Saint Mary of the Woods, IN 47876
(812) 535-5232
lpantazi@smwc.edu

My signature below indicates that I am 18 years of age or older, I have been informed about this study, I consent to participate, I consent to the researcher collecting my survey data and artwork, and I have received a copy of this consent form.

_____ _____

Signature Date