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An Exploration of Identity Through Data Driven Art

Lisa O'Connor
University of Northern Colorado

University of Northern Colorado
Greeley, Colorado

AN EXPLORATION OF IDENTITY THROUGH DATA DRIVEN ART

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Lisa O'Connor
College of Humanities & Social Sciences

Anna Ursyn, PhD
College of Visual and Performing Arts
Advisor

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AN EXPLORATION OF IDENTITY THROUGH DATA DRIVEN ART

PREPARED BY: Lisa O'Connor

APPROVED BY THESIS ADVISOR: Anna Ursyn, PhD

HONORS FELLOW: Kristin Bovaird-Abbo

HONORS DIRECTOR: Loree Crow

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Abstract

This creative project is an interdisciplinary exploration of identity through data driven fiber art using applied research methods. The purpose of the project is to explore female self-identification on the campus of the University of Northern Colorado (UNCO) in comparison to the overriding messages of identity and social position transmitted within the American educational system. This is achieved through the interview of 64 participants equally distributed between two distinct areas of academic life: the math and sciences departments in Ross Hall, and the Stryker Institute for Leadership Development. Each group of women has been asked the questions “who are you first?” and “who are you next?” down through seven levels of their identity. Participant’s responses have been color-coded and converted into quilt blocks, with the size of each color area determined by its location in the hierarchy of responses. These individual portraits of identity compose two quilts, grouped according to interview location, providing a visual cross section of the women at this university; the portrait of a group composed from individual portraits of the identities that occupy the same spaces. By presenting the creative project in a public forum, the collective portraits highlight commonalities between student groups, strengthening the foundation from which we drive forward the conversations of identity and social justice on our campus.

Acknowledgments

I want to acknowledge first and foremost the 64 women who were willing to talk to this complete stranger who asked such a personal question. Thank you for your openness and for sharing yourselves with me, even the painful parts. I hope you realize how beautiful you are, and how much you can become. Without you there was no project. Thank you also to the Stryker Leadership Institute leaders who allowed me to take precious time out of a retreat day to present my project and collect my data.

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Introduction

It is the nature of the social sciences to measure things, whether the weight of a person or their political views, we measure. To understand if the measurement is a unique phenomenon or representative of a larger trend it is necessary to measure many examples of the same thing. An unfortunate result is that to accurately measure and compare, the subjects are sorted and filtered until their uniqueness and beauty is erased. In the end they become numbers to chart and graph, and the final report is unrecognizable as unique participants who began the whole process. It is the assertion of this project that while the measurement of data collection may require grouping, sorting, and an academically sound method of interpreting the results; it does not require the reporting of those findings to be dehumanized and lifeless.

As much of art is numbers and ratios; whatever is quantifiable for the statistician is also qualitative fuel for the artist. The bars on a graph can be rearranged, the shapes of the bars can be altered, and different participants could be overlaid on top of each other or over an abstract composite of the dominant identities. Through the methods of data driven art, the dry statistics which compose the bar graph are reclaimed and transformed into an object of art that reflects the uniqueness and endless variety which are people. In the case of this project, the compiled list of identities from both locations were randomized and matched to a list of randomized color/texture combination before being added to the block template. The sizes of the seven areas of color were drawn to reflect their position in the list of identities from the participants. The resulting images were the arranged into quilts according to location, each using the same color but producing very different results.

The purpose of this project is to combine data collection with fiber art to explore how women attending University of Northern Colorado (UNCO) define their individual identity; the ways in which layers of identities interact to create a distinct personality within the larger community; and to place these interpretations of identity within the larger conversation of gender equity and social justice. It is by necessity an interdisciplinary effort. While art, political science, women's studies, psychology, and statistics all try to understand identity from their own particular perspectives, none answer the question fully. The combination of multiple approaches, formed a more complete picture; and by better understanding this, how women within UNCO define and express themselves, and by identifying their commonalities and complementary differences, the community of women on the campus of UNCO can deepen their platform of solidarity and interconnectedness.

Literature Review

Math in the service of art

Math and art have been intrinsically connected by the attempts of both to "render the invisible visible" though each subject appears at first to be approaching this objective from opposite ends of the spectrum (Ornes, 2019 p xiii). The search for the exact proportions of beauty in modeling the human body was refined during the Renaissance but was not perfected, and began much earlier (Atalay, 2004). The earliest documented study of proportions is from 440 B.C. when the master sculptor Polykleitos wrote *The Canon*, containing his descriptions of the "perfect proportions for the human body" (Gamwell, 2016). His original text is lost except for fragments, but one surviving piece states "beauty comes about little by little through many numbers" (Gamwell, p. 11). The

Spear-Bearer in Naples, Italy is believed to be a copy of the original work created by Polykleitos, made to his ideal measurements (National Archaeological Museum of Naples). In 1511 Leonardo da Vinci created a visual study of human proportions that has become one of the most famous images in western history, *The Vitruvian Man*, based on the golden ratio (Atalay, 2004). Not long after this, the German scholar Albrecht Drurer measured more than two hundred bodies as the basis for his illustrations of proportions, trying again to confirm the ratios of ideal beauty in the human form (Atalay, 2004; Gamwell, 2016).

Perspective, and the illusion of three-dimensional space created on a two-dimensional surface, is another example of math serving as a foundation for art. Plato held that lines, circles, and the geometric shapes constructed from them were the foundations of beauty in its purest form, and it was on this basis-- their mathematical accuracy of depicting space-- that he praised a certain scene painter from the Greek theater (Atalay, 2004; Gamwell, 2016). As the study of projective geometry began to develop, its timeline so closely mirrored the development of formal rules of perspective in art that Atalay calls "an all-pervasive interaction…between art and science" (Atalay, p. 115). The formulation of theorems for precise depictions of three-dimensional scenes became "the quest of Renaissance artist[s]" and drove projective geometry into a fully developed mathematical field in its own right (p.117).

Math as the subject of art

Math Art as a specific field within the art world is relatively young, and according to Stephen Ornes "isn't…well defined" (Ornes, 2019, p xii). It goes beyond just being a

mathematical model or visualization; the work must contain an element of intentionality, of being “created for their aesthetic appeal” while still being “built on the bones of mathematical rigor” (Ornes, 2019, p. xii). Fathauer goes beyond this definition to infer a distinction between artist-created works and algorithm-generated work, (Fathauer, 2007). By combining these two definitions, I will examine works directly created by artists for aesthetic appeal, with mathematical underpinnings; broken out into two very broad categories-- math as the subject of the art, and math as an inspiration of the art. Math as the subject of art includes works when mathematics is the art, such as mangour screens, tiles, or diagrams of mathematical proofs; when mathematics is the central feature being dealt with. Math as inspiration is when the mathematics has become an artistic tool used in the creation of a piece, much in the same way that the painter uses a brush or the sculptor a chisel. Math has inspired the work, but is less literal in its representation.

In ancient Islamic cultures the strict interpretations of religious texts prohibited the depictions of anything “in the heavens or below” (Ornes, 2019, p. 168). As a result, mathematics became the art itself. The intricacy of angles and knotwork in mangour screens continues to be replicated and studied by modern carvers and artisans (Bonner, 2018; Gamwell, 2016; The British Museum 2019). Transferred to tiles, these same geometric forms became tessellations, patterns that repeat themselves and cover a surface with no gaps. These repeating, interlocked shapes are considered “a gateway between math and art” (Ornes, 2019, p. 171). Tessellations are found on

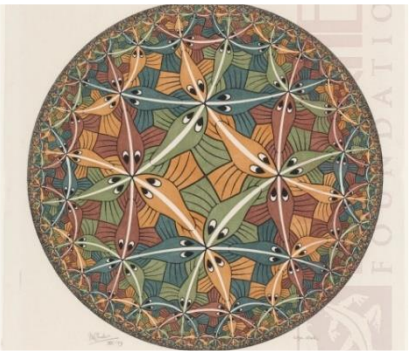

Figure 1. Circle Limit III by M.C. Escher. December 1959. Woodcut, printed from five blocks. Rterieved from https://mcescher.com/gallery/mathematical/

floors, walls and ceilings in ancient structures, and heavily influenced M.C. Escher throughout his career (Gamwell, 2016; Ornes, 2019; Peterson, 2001). Traditionally they are geometric patterns, variations upon the only three regular polygons that can tile a plane- the triangle, the square, and the hexagon. This use of classical mathematics as art is not limited to ancient cultures. In addition to Escher, it is found in the paintings of Crocket Johnson, and the fiber art of Daina Taimina among others.

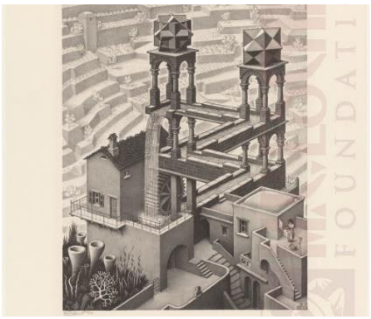

Figure 2. Waterfall by M.C. Escher. 1961. Lithograph. Retrieved from https://mceschер.com/gallery/impossible-constructions/

At the time that M.C. Escher was working, Math Art as a field did not exist yet, but he is perhaps the best recognized math artist in the western world (Ornes, 2019). He would move into math as an inspiration, but his work began with math as the subject in tessellations, and in creating hyperbolic spaces. Escher took the typical combinations of polygons and transformed them into the repeating images of birds, fish, bugs, and reptiles (Figure 1). When Escher found the Poincare disk model of a hyperbolic plane, he extended his experiments with dividing a plane to fitting "an infinite world in a finite space" (Ornes, 2019, p.143; Peterson, 2001). As with the tessellations, he took the basic geometric model of the hyperbolic plane and converted them into fish, birds, bats, and even men on horseback; while never breaking the mathematics of the model. In Escher's own words through his

Figure 3. Proof of the Pythagorean Theorem by Crocket Johnson. 1965. Paint on masonite. Retreived from https://ids.si.edu/ids/viewTile/A/eb0/eb0c7036d64806bf460854eb4663d33a_files/10/1_2.jpg

exploration of tessellations and the hyperbolic plane, he "ended up in the domain of mathematicians" (Ornes, 2019, p. 170). Escher never completely quit using math as art, but he also created works where math inspired the art. He is well known for his distorted perspectives and impossible objects, such as the impossible staircase in *Ascending and Descending*, 1960, and the self-feeding waterfall in *Waterfall*, 1961(Figure 2) (Gamwell, p. 342 and 343, 2016; Ornes, 2019).

Like M.C. Escher, Crocket Johnson was creating math-based art before Math Art was fully developed. And like Escher's use of models to create original works, Crocket Johnson created a series of paintings that were exact replications of Euclidean proofs in every detail, only much more attractive (Figure 3). He took the diagrams and applied a modern use of color and contrast, making the theories themselves into works of art (Ornes, 2019; Stroud, 2008). Between 1965 and 1967 he completed thirty of the roughly one hundred and seventeen geometric paintings he would complete before his death in 1975. His stated ambition was to "commemorate some of the major milestones of geometry and mathematics…over the [previous] 2,500 years" (Stroud, p.80). In his paintings, Johnson was meticulous in preserving the proofs that he was commemorating. He used the lines of each diagram, filling them with contrasting colors, but never altering them. The master proofs and the theorems they established are still clear and articulate in his final images. In addition to the illumination of classical proofs, Crocket Johnson also painted several independent mathematic explorations, including a proof for squaring the area of a circle, and the construction of a regular heptagon (7-sided). This second problem was not as famous as the squaring of a circle, but it had eluded mathematicians for just as long. Each proof was reviewed and published in an academic journal, (1970,

and 1975 respectively) with Johnson receiving full credits for his accomplishment (Figures 4 and 5). And like his use of the classic models the painting created from these two proofs are not interpretations or impressions, they are meticulous yet aesthetically pleasing recreations of the academic diagrams.

Figure 4. Euclidian Values of a Squared Circle by Crockett Johnson. 1970. Paint on masonite. Retrieved from https://americanhistory.si.edu/collections/object-groups/mathematical-paintings-of-crockett-johnson?page=6

The study of classical math has been one of many tools utilized in the creation of art for thousands of years. But it is important to note a time when these roles reversed, and art contributed directly to the advancement of mathematics by solving one of the "three infamous unsolved compass and straightedge problems" of the ancient Greeks (Stroud, 2008, p. 83). In 1968 Crocket Johnson, a painter and amateur mathematician began to study the problem of squaring a circle using just a compass and a straightedge. And he succeeded. His approximation of squaring the area of a circle, with a radius of 1, was accurate to seven decimal places of pi (3.141592686) (Stroud, 2008). There are two surviving paintings created from his study, a third is believed to have been finished but lost. This was his own, original

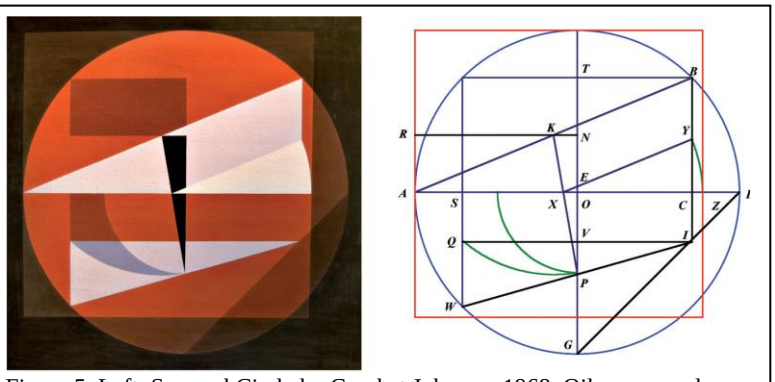

Figure 5. Left: Squared Circle by Crocket Johnson. 1968. Oil on pressed wood. Private collection. Photo by Dane Webster. Painting reproduced with the permission of the estate of Ruth Krauss. Right: The diagram given by Johnson when his proof was published.

work, and he considered it his greatest achievement. A diagram of the model and his proof were published in *The Mathematical Gazette* in 1970. In his exploration of art, combined with his love of numbers, he solved a problem which had eluded the greatest mathematicians for centuries.

Daina Taimina is quite literally the first name in fiber art in the math world. When she first crocheted a parabolic equation, it was as a model for use in her classroom (Taimina, 2009, 2012). This was followed by other professors and mathematicians requesting something similar for their own use. As she created literal models, she also began to experiment with hyperbolic shapes in general, combining them or varying the rates of increase. This has led to a career as a fulltime artist specializing in hyperbolic forms, giving lectures and workshops; and has inspired community collaborative coral reef installations around the world (Jarreau, 2015; Siboni, 2019; Taimina, 2012). Some of her designs are now available in books for other fiber workers to recreate. Like Escher, her work began with mathematics as the art and grew into mathematics as an inspiration for her art.

Figure 6. No title. By Daina Taimina. Retrieved from https://crochetcoralreef.org/contributors/daina_taimina.php

Many other artists use literal equations in forming their art work, using computer programs and algorithms to color or map the progression of graph points as they are

plotted (Nau, 2007). The images that result can be a compilation of calculations that would take years to complete by hand, it is beyond what any individual artist could create alone. The Mandelbrot Set and fractals being only two foundations for countless artists (Della-Bosca & Taylor, 2009; Ewald, 2010; Fathauer, 2007; Ornes, 2019). The distinction lays between what is created by programing an algorithm into a computer, and what is created by an artist using the computer in much the way they would use a paintbrush or chisel, controlling and directly orchestrating the final product (Fathauer, 2007). To complicate this distinction, there is also the harmonograph to consider and whether the use of these drawing automatons constitutes Math Art or not, although it uses neither a computer nor an algorithm (Ornes, 2019).

Math as inspiration for art

Although he works in stone and metals and snow, Helaman Ferguson like Daina Taimina is a prominent name in Math Art sculpture. They both have come into their art during the period when Math Art was young, but developing quickly. They are

Figure 7. Plexus no. 36 by Gabriel Dawe. 2016. Thread, painted wood, hooks. Retrieved from https://www.gabrieldawe.com/plexus-no-36

among the first generation to be acknowledged as Math Artists. He describes his work as "drawing from mathematical resources that go back to the very beginnings of our culture…[and] sending these mathematical messages into the future" (Peterson, 2001, p. 33). Where equations feature in his work, they have been made to describe the form, not necessarily the form made out of the equation. Unlike many modern math art sculptors, all of his works are created by hand and power tool. He uses "mathematics as a sophisticated design language" and a computer to plan his sculptures, but does not use 3D printing or virtual projections to execute them (Peterson, 2001, p. 13). He specializes in tori, doughnut shapes, and how they can be transformed, such as into a Mobius ring; and in studies of symmetry.

Two younger artists of interest are Gabriel Dawe and Nike Savvas, although neither appears in the publications of math artists. Gabriel Dawe has two series of installations that are of interest: *Game Theory 1* and *2*, and *Plexus*. Nike Savvas has three installation series of note: *Atomic*, *Sliding Ladders*, and *Sparks*. Each uses geometric shapes, and scientific elements (such as off-set plaid weaving, or prism-like shafts of color from threads, or the idea of atomic movement) in their art, but with no

Figure 8. Sliding Ladder: Truncated Icosahedron by Nike Savvas. 2010. Wood, wool, and steel. Retrieved from https://nikesavvas.com/art/?tag=sliding%20ladders

acknowledgment of the mathematic or scientific element. In their different expressions, the presence of math in their art is reminiscent of previous generations. Respect without the reverence, or the self-consciousness of using the title math artist. Their work raises the question of not just what is math art, but who are math artists, and who gets to decide if you are one or not?

Data Art

Data driven, or data inspired, art is a branch of math art that combines statistics, algorithms, and frequently computer programing to create art. There is a long tradition in the art world of taking whatever is at hand and creating something new out of it, even if the raw material was essentially garbage (Michails, 2015). In modern American life a relatively new (20-30 years) raw material is data, large amounts of statistical data. As the internet developed and technology has advanced, more aspects of daily life are spent interacting through network or social media platforms. With every keystroke the population is both generating and assimilating data at an overwhelming rate (Li, 2018; Michails, 2015; Whitelaw, 2008). Artists have responded by appropriating the new raw material and attempting to make sense of this newer element of modern life. This mountain of statistical data is then reinterpreted “according to the artist’s creative purpose” resulting in digital images, virtual sculptures, or interactive displays (Li, p. 300, 2015). There are installations using social media posts; a combination of stock market and weather reports; area rainfall and water usage; even real time energy consumption of the building hosting the installation. (Li, 2018; Michails, 2015; Whitelaw, 2008).

Data art, sometimes called data visualization art, grew out of data visualization in the 1990's and has been especially strong since the early 2000's (Li, 2018; Michails, 2015; Whitelaw, 2008). Data visualization focusses on "friendly" and aesthetically pleasing information presentation that increases usability and comprehension (Li, p. 301, 2018). For example, the use of differently sized colored bubbles to denote proportions of data in comparison to other sets that users can manipulate by changing the variables, such as demographic data of a certain population. Data art uses the same raw numbers to "convey complex ideas…quickly and clearly" but with no illusions of objectivity or prioritizing functionality (Michails, p. 280, 2015). The goal is to "foster emotional engagement with the data" (Li, p. 301, 2018). By presenting what may be familiar information in a platform that breaks recognition with previous assessments or experiences, the artist can reintroduce a viewing public to data in a neutral way. This allows the opportunity for exploration without preconceived ideas interrupting the flow of information (Li, 2018; Whitelaw, 2008). This is also an opportunity for the artist to reestablish the connection between the data and the humanity behind it. Internet and social media users are flooded with data throughout their day, creating an impression that the data is an object unto itself, a separate being from the real world (Whitelaw, 2008). Data art can provide context within this very confusing exchange.

Data art is typically high tech, most projects are digital, experienced through online platforms and interactive or immersive environments. This tether to technology has raised a concern that projects can slide into focusing more on the technological adaptations underpinning the artistic expression, than on the expression itself (Li, 2018; Michails, 2015; Whitelaw, 2008). It has been pointed out that the data generated by

human beings is not independent from them; this new raw material is relational, and contingent upon real life. Even if the works created have no physical manifestation in the 'real world,' the data's usage has real consequences there (Michails, 2015; Whitelaw, 2008). As art is an attempt to describe and orient ourselves within a constantly changing human condition, it is important that artists remember the data they are utilizing only has meaning within that framework.

Fiber Art

Since its emergence in the 1960's-1970's fiber art has had a complex relationship with the larger world of fine arts, mainly stemming from the fact that the materials used in fiber art have been traditionally associated with crafts or utilitarian construction, and a domestic sphere (Auther, 2002, 2008; Shiner, 2012). For many of the following decades, fiber art was considered as "falling somewhere between" the two worlds of fine arts and crafts with neither side wanting to fully accommodate its existence (Auther, 2002, p. 2; Auther, 2008; Shiner, 2012). The open weaves and nontraditional sizes or orientation of materials were not 'craft' by their nature of nonutility and sometimes indeterminate shape but were also not considered 'art' due to the physical nature of the materials with which they were constructed.

It is during the current post-disciplinary movement in the art world that the boundary between fiber as craft and fiber as art came to hinge less on the materials used and more on the creator's intentions (Auther, 2002, 2008; Shiner 2012). This movement has been characterized by a shift away from specialized mastery of limited techniques toward a generalized capacity to switch between multiple mediums and methods (Shiner,

2012). Skills are picked up as needed, in contrast to two hundred years ago when it would be common for an artist to spend a lifetime mastering their selected discipline (Shiner, 2012). With this movement came a change in attitude toward fiber. The traditional materials of craft construction are now seen as capable of communicating artistic expression, and the adaptation of any material (not just the traditional media of paint, stone, wood) has a valid contribution in the creation of art (Shiner, 2012). These changing attitudes allowed the emergence of a distinction between the fiber-based work intended as a "decoration of everyday utility", meant "to be sat on [or] walked on [or] only to be looked at," and a work that "requires sustained attention" (Auther, 2002, p. 8; Auther, 2008, p. 27, 21). In the latter, the craft materials are elevated beyond a necessity of construction to become a structural medium through which the artist articulates a complex statement (Auther, 2008, Shiner, 2012).

The work that represents Math Art comes in a wide variety of mediums; however flat images (paintings, drawings, digital or algorithm generated images) and sculptural appear predominant (Ewald, 2010; Fathauer, 2007; Fisher, 2010; Ornes, 2019; Peterson, 2001). The advent of 3D printing has opened up the availability of sculpting to artists who either don't have the technical education or are envisioning structures impossible to carve out of a preexisting solid (Akleman, 2009; Della-Bosca & Taylor, 2009). The use of digital tools and computer programs to compile images out of algorithms can create details much finer than any paintbrush, with greater speed and flexibility in editing. Beyond the work of Daina Taimina, there is a lack of fiber representation within Math Art. Fibers appear in string art, crocheting of hyperbolic models, and weaving, but are largely missing from anything beyond these limited expressions. At the 2010 Joint

Mathematics Meeting Exhibition there was one piece of fiber art mentioned. In a 2009 exhibition at Flaten Art Museum there were none (Ewald, 2010). Following Taimina, the most recognizable names are Belcastro and Yackel. They have authored two books together, collecting projects by multiple mathematicians for crafters to follow and reproduce at home. They note that searches for literature connecting fiber arts and mathematics "yields basically nothing" (Belcastro & Yackel, 2008, p. 2). Amongst the contributors to their books, knitting has the best representation. But again, the books are written for home crafters, with the projects including pillows, hats, and baby clothes. The examples of quilting, and the majority of the examples of crochet are either not original works or are patterned with the intention of reproduction by other crafts people, making them less art and more hand crafts (Belcastro, 2007; Yackel, 2018). Hand crafts can be executed with sophistication and fine detail, but the intentions of reproduction vs uniqueness and originality of pattern are significant, as is the absence of a larger statement to be communicated through the creation of the projects.

Education on Identity

The idea of identity, and specifically how identity comes to be form, is a beautifully tangled up mess. When or how it begins, and which sources of input are most influential remain open for debate and without resolution. This is due to the overwhelming number of potential influences on the individual as they grow and develop. Family size, structure and birth order; socioeconomic condition; rural versus urban; religious traditions; gender; race; ethnicity; culture; education; parent's education level; childhood trauma; inherited trauma; and national trauma just begin to cover the list

of influence on the development of identity. If this can be untangled sufficiently to assign degrees of power per sources in the process, there remains the questions of what external message was being communicated, how was it interpreted and internalized, and was it accepted or rejected.

The students interviewed for this project were selected first on the basis of being students at the University of Northern Colorado (UNCO) first and female second; and for that reason education was the primary influence considered in formation of identity. In addition to the selection criteria, there is also the consideration of raw time spent within education institutions throughout the formative years. As college students, these women are nearing the pinnacle of their educational careers, with a significantly greater number of years behind them than before them.

Research shows there is a hidden curriculum of gender bias embedded in the education system that female students are expected to conform to on campuses across the United States and around the world. This hidden curriculum comprises the implicit rules and behavior expectations that students must "discover and respond to…in order to survive within [the classroom]" (Jasmani et al., 2011, p. 62). It is communicated via textbooks and teaching materials in combination with the linguistic choices and social cues of instructors. If and when a female student does not behave in accordance with these stereotyped expectations she will be penalized academically as well as professionally (Blumberg, 2007, 2008; Basow, 2004; Carter, Duenas, & Mendoza, 2019; Lawlor,2020; Menegatti, 2017; UNESCO 2008). Gender bias within textbooks and classroom structures, and the official content of school curriculums have been studied continuously since the late 1960's, especially following the passage of a package of laws

aimed at eliminating inequality of access to education (Title IX of the Education Amendments, 1972; Women's Equity Act, 1974; Vocational Education Act, 1976; Career Incentive Act, 1977). Under these laws, educational institutions were mandated to create programs to eliminate gender discrimination and stereotypes from the classroom. Most of these programs have focused on "academic preparation" and "individual characteristics" of students and not on the institutional structures that female students encounter within the local, state, or federal levels of education (Basow, 2004, p. 118). As a result, there has been much less research on the gender bias of the structural elements in education, including the linguistic patterns in active instruction and written evaluations. Gender bias in textbooks remains "a low-profile educational issue" in the minds of education administrators (Blumberg, 2007, p. 345). A position which allows the underrepresentation and misrepresentation of women to continue at "near universal" levels in primary and secondary textbooks, over fifty years after being recognized as a significant barrier to equality of education (Blumberg, 2007, p. 345).

The three key dimensions of gender bias in textbooks are 1) Underrepresentation-- both as subject of significance and in page space allotment when women are discussed; 2) Underrepresentation in illustrations and images; and 3) Misrepresentation in text or illustration and images (Blumberg, 2007, 2008; Jasmani et al., 2011; Lawlor & Niiler, 2020). These three dimensions appear in classroom materials at the earliest levels of education. A survey of illustrated stories used in pre-kindergarten and early elementary classrooms from 1980 found that of illustrated animal characters 75% were male (Basow, 2004). Illustrations overall, human and animal, were 66% male. These characters were given actions related to adventures and active agency, whereas the range of activities for

female characters was much narrower and they were depicted as “more in need of being rescued” (Basow, 2004, p. 119). A repeat of this study in 2001 found the pattern remained. The male characters were again depicted in activities with agency and power, but female characters were still restricted in their roles and more often present as an “observer or cheerleader” (Basow, 2004, p. 119).

As children age up through the education system, these discrepancies of presence and allowable action increases (UNESCO, 2008; Jasmani et al., 2011; Lucy et al., 2020). Women are virtually “invisible” in secondary texts for STEM, psychology, history and political science courses (Peterson & Kroner, 1992, p. 18). When female subjects are present in the texts they are most frequently presented as “outsiders” or exceptions to the general female population (Blumberg, 2007, p. 119). In 2020 Li Lucy led a team at Stanford University using an artificial intelligence program to examine the entire text of fifteen U.S. history textbooks from public schools in Texas. That state being chosen specifically due to its extreme influence on textbook publishers in the United States. Of the top fifty individuals named, only one woman is present-- Eleanor Roosevelt. The research team documented that women were most likely to be described in terms of their marital status or domestic work; while the word least likely to be associated with a woman or women was “political” (Lucy et al., 2020, p. 11). Whether counted by number of famous persons included per textbook, or by page space allotted “history textbooks [are] dominated by a single demographic [white men] with few exceptions” (Lucy et al., 2020, p. 8). The textbook authors had “omitted almost all women of importance” leaving history and scientific discovery exclusively male-driven (Blumberg, 2007, p. 352). A situation which in no way reflects the number of women in the population in general, nor

the number of women researchers, scientists, teachers, doctors, and other professionals who have contributed to our society (Blumberg, 2007, 2008; Lawlor & Niiler, 2020; Lucy et. al., 2020; Peterson & Kroner, 1992, UNESCO, 2008).

Gender biased textbooks and teaching materials are purchased by school districts intentionally, giving State sanctioned authority to all of the contents, even that which "goes beyond the official statements of intention" on the part of the districts (Jasmani et. al., 2020, p. 62). The collection of their contents "reflect the power asymmetries and taken-for-granted beliefs of the underpinning culture" (Lucy et. al., 2020, p. 2) and contribute to an "academic culture [that] is unwelcoming and isolating" for female students from pre-k throughout their post-doctoral careers (Carter, Duenas, & Mendoza, 2019, p. 76). Female study participants often described it "as a uniformly hostile place for women" (Carter, Duenas, & Mendoza, 2019, p. 76).

Another significant contributor to the hidden curriculum of gender bias in the classroom is the instructor. Specifically, the linguistic patterns of the instructor in direct instruction and in written evaluations, and the social cues displayed in responding to students. The 2008 UNESCO Global Monitoring Report on education describes "learning opportunity structures" as who is allowed or encouraged to speak during classroom interactions, and who is allowed or encouraged to take turns during learning activities (UNESCO, 2008, pg. 87). These patterns are documented to favor male students over female students in American classrooms (Barik, 2020; Basow, 2007; Blumberg, 2007, 2008; Carter, Duenas, & Mendoza, 2019). Male students not only receive more praise, encouragement, and constructive feedback than female students, they are also asked

higher thinking order questions than their female classmates. Which in turn elicits "greater praise and reinforcement" (UNESCO, 20078, pg. 87).

Teachers and administrators are in a position to "act as powerful" role models for female students "provided they are aware of the many social and learning biases that exist and act to overcome them" in their own teaching and classroom management styles (UNESCO, 2008, p. 87). Unfortunately, studies show that educator "attitudes and perceptions reveal harmful biases" regarding female students and their intellectual capabilities (UNESCO, 2008, p. 87). As a result, educator classroom management more often supports gender segregation and bias through activity structures and verbal comparisons made along gender lines (Basow, 2004; Blumberg, 2007, 2008, UNESCO, 2008). Overt discrimination, such as classes being mandated or prohibited on the basis of gender, are outlawed in the United States; however, the implicit discriminations remain deeply entrenched in classrooms at all levels of the education system (Basow, 2004; Blumberg, 2007, 2008; Carter, Duenas, & Mendoza, 2019; Ferrall & McHugh, 2017). Educator language choices and physical cues comprise an essential element in transmitting this discrimination and the implicit rules of gender role behavior expectations to female students (Carter, Duenas, & Mendoza, 2019; Jasmani et. al., 2011; Menegatti & Rubini, 2017). Studies of classroom dynamics beginning in the 1980's up until the current work has consistently demonstrated that male students continue to receive more attention and encouragement from instructors than female classmates. However, these patterns "appear[ed] to be invisible" to the teachers and administrators (Basow, 2004, p. 122). Even including more extreme and overt forms of discrimination connected to classroom management such as sexual harassment. Studies of sexual

harassment among students have documented that “unwanted and unwelcome sexual behaviors…can begin in elementary school and often occur in the presence of teachers” (Basow, 2004, p. 120-121). These implicit and explicit classroom structures are reflected by the wider patterns of employment in education, which follow the pattern of “traditional gender roles” stereotypes (Basow, 2004, p. 121). The higher the prestige of a position, the higher the percentage of males filling that position. By full professorship at universities, women are steeply outnumbered (Blumberg, 2007; Dionne, 2019; Farrell & McHugh, 2017; Voeten, 2013). Students observe and internalize these patterns, which further cements the legitimacy of gender biased behavior patterns on the part of instructors.

The language used by educators in their interactions with students is a “powerful means” by which gender bias is hidden in plain sight (Menegatti & Rubini, 2017, p. 1). These choices of vocabulary and linguistic patterns are the product of habit. Unlike gendered languages, such as French or German, most English nouns and dependent grammatic elements have no marking of gender. This dimension is added through the lexical choices made on the part of educators. The use of the male as a universal reference is a dominant approach in attempting gender neutral instruction; however, it has the opposite effect than the one intended (Basow, 2004; Farrell & McHugh, 2017; Jasmani et. al., 2011; Menegatti & Rubini, 2017). When male nouns and pronouns are used in the generic “women disappear in [the] mental representations” of the listeners (Menegatti & Rubini, 2017, p. 1). Changing these habits of speech is essential “in order to reduce gender bias” in education (Menegatti & Rubini, 2017, p. 1).

The problem of language use on the part of instructors extends into their written evaluations of students and the use of varying levels of abstraction. Positive comments for male students are often written in more abstract phrasing, presenting as fixed and more permanent aspects of their character and not strictly associated with their academic performance. Critiques, on the other hand, are more often written in concrete phrasing, presenting as temporary obstacles and changeable in the future. These are also more likely to be strictly related to academic performance and not related to character (Barik & Rajkhowa, 2020; Biernat & Fuegen, 2001; Carter, Duenas, & Mendoza, 2019; Stegmaier, Palmer, & Assendelft, 2001). Female students experience the reverse. Praises are tied strictly to academic performance and are phrased in the concrete temporary; while critiques are phrased in the abstract permanent and character evaluative in content.

Examples of these types of linguistic distinction biases appears in the earliest phases of the selection and evaluation process (Biernat & Fuegen, 2001; Carter, Duenas, & Mendoza, 2019; Farrel & McHugh, 2017). The female student related linguistic patterns are consistent in letters of recommendation, official evaluations and grading, reviews of academic applicants, and evaluations of submissions for publication in academic journals. These examinations of content and lexical choices show that female students and academics are held to a higher standard of performance than their male counterparts and are more harshly critiqued if they fail to meet this raised bar (Biernat & Fuegen, 2001; Carter, Duenas, & Mendoza, 2019; Farrel & McHugh, 2017; Stegmaier, Palmer, & Assendelft, 2001). This fluctuation in "linguistic abstraction…is a very subtle resource" for perpetuating gender bias in education because these linguistic habits are acting at the implicit level of cognitive processing, which "occurs automatically" and

most commonly are “unintentional acts by teachers” (Farrel & McHugh, 2017, p. 5; Jasmani et. al., 2011, p. 62 quoting Whitcomb). Whether intentional or not, these discriminations “play a particularly powerful and insidious role in perpetuating gender inequality” in education (Menegatti & Rubini, 2017, p. 7). They simultaneously create and compound the barriers that restrict female access to an equitable education in the United States.

Educators hold powerful social positions to either validate and perpetuate gender biased stereotypes or to disrupt and challenge them. The implicit biases educators hold have been shown in studies to be a better predictor of future behaviors than their explicitly stated attitudes (Carter, Duenas, & Mendoza, 2019; Farrel & McHugh, 2017). But first, the educator must be trained to recognize when this is happening in their classrooms. Unfortunately, content in teacher prep programs that acknowledge or address linguistic bias are not only “rare,” the textbooks used in teacher prep programs contain the same rate of misrepresentation and underrepresentation of women found in other fields of study (UNESCO, 2008, p. 88; Barik & Rajkhowa, 2020 Carter, Duenas, & Mendoza, 2019; Blumberg, 2007, 2008; Lawlor & Niiler, 2020; Lucy et. al., 2020; Peterson & Kroner, 1992). This absence of teacher prep materials that identify and address the problems of implicit and structural biases in the classroom, and the lack of understanding of the effects of linguistic discrimination, contributes to the perception of their naturalness (Carter, Duenas, & Mendoza, 2019; Farrel & McHugh, 2017). Educators and administrators conclude that female students who can’t achieve high levels of education “failed on their own terms,” never recognizing these “structural constraints” or their effects on equality of opportunity (Carter, Duenas, & Mendoza, 2019, p. 64, p. 64).

This sets up a self-reinforcing cycle—education institutional leaders and instructors believe that women are simply not talented enough or lack the innate intelligence necessary to succeed in male dominated fields. This makes their absence from the positions of greatest prestige due to an "internal deficiency" instead of being due to structural biases in education institutions (Carter, Duenas, & Mendoza, 2019, p. 42). Their absence supports the persistent use of misrepresentative materials and discriminatory classroom management and evaluation practices, which further inhibits opportunities for women's success in academia.

A gender aggressive academic culture has been created in American classrooms by the chronic misrepresentation and underrepresentation of women in teaching materials, which is detrimental to the long-term educational outcomes and by extension the career aspirations, of female students. Same gender examples and role models are either absent, or depicted in demeaning and belittling ways. They are shown passive and inactive women with little to no social significance or political life. The speech and interactive biases on the part of educators pressures female students to conform to these gender biased behavior expectations, and serve as punishment for the female students who don't. This culture "seem[s] to arise in K-12 education" and it remains "unwelcoming and isolating" for female students throughout their academic careers (Carter, Duenas, & Mendoza, 2019, p. 76, p. 76).

This misalignment of intention and action is due to the education that they received, beginning in pre-kindergarten and continuing throughout all levels of the academic system. Curriculum content, teaching materials, and reading lists perniciously erase female figures, misrepresent their roles in history, and can even credit their

discoveries to a male colleague. In illustrations women are overwhelmingly depicted as suffering from disorders or receiving medical intervention, not as a medical professionals or experts, not even as teachers. Through classroom management they are taught to go last, be quiet, and be criticized. The early age at which this begins, and the persistence of it blinds them to it effects in their later life.

These depictions of females as passive, incapable, and absent are in stark contrast to the "real world", where the population is more than 50% female. In addition to population, women have outnumbered men on college campuses for decades. Women are in professions, women are legitimate actors, and women are agentic and informed. In the face of the real world, are the messages of insignificance to the public domain internalized and default assignment to the private internalized and accepted by the female students at UNCO? Do they see themselves in this more communal, domestic, relational image?

Project Design

The two main components of this project are the collection of personal data from participants regarding perceptions of identity, and the execution of the art pieces. Information was collected through personal interviews with women from two distinct areas of academic life: the math and sciences departments in Ross Hall, and participants in the Stryker Institute for Leadership Development. Research participants provided anonymous answers to two questions of identity, "who are you first?" and "who are you next?" for seven levels of identity. These responses were recorded, color coded, and converted into a quilt block pattern. Each quilt block was constructed of colored elements representing the individual's sense of identity. The elements were graduated in size to

correspond with level of importance, the largest colored area representing the most important element to smaller areas representing those of lesser importance. The completed blocks were then grouped according to data collection locations and sewn together into a two-sectioned quilt. Of the 64 women interviewed for the project, a small number did not provide a full seven answers to the questions, with a final count of 439 responses.

Methods

The interviews for this project were collected from Ross Hall, math and science hallways, and the Stryker Leadership Institute (SLI). As a participant in the SLI, I requested and was granted permission to ask the other members of my cohort for interview data during a regularly scheduled workshop day. I was able to collect the 32 interviews on a single day during Spring 2020 semester, prior to the COVID-19 shutdowns. I had planned to collect interviews in Ross Hall by first approaching the women who were frequently in the Math Lounge study area, and others with whom I was visually familiar from occupying the same classroom spaces. Knowing in advance that this was not a sufficient number, I would then proceed to requesting interviews from any female student in the science hallways in Ross Hall. While this process would not meet the technical requirements of randomization, moving out of the math dominant hallway would be a way to select participants from social groups unknown and unfamiliar to myself. The first 27 Ross Hall interviews were collected toward the end of the Fall 2019 semester, the remaining five were collected in early Fall 2020.

The immediacy of emotional investment in this project on the part of interviewees was a surprise, and significantly changed how the data was collected. I began as planned

with requesting an interview from three women I had seen in the Math Lounge on prior occasions. Following these interviews my plan was interrupted by their independent recruitment of additional participants. This pattern repeated with new interviewees bringing another participant to also answer my questions, or previous interviewees gathering multiple other female students. In some cases the previous participant would refer to the new woman as a "victim for [my] project," in other cases it was a more general statement of "[she] should answer your question" or that they should "do it too." In all, 24 of the 32 participants were not approached by me, but were brought by previous participants over the course of three days, selected on the basis of a preexisting relationship between them. The end result fit my intended parameter of speaking with a population as unfamiliar to me as possible, just not in the manner expected.

Another surprising response was the levels of emotion that answering the questions generated at this location. Every Ross Hall interview included a statement at some point of never having been asked this before or stating that no one had ever wanted to know them before, and over half cried at some point during our conversations. Ross Hall interviewees also made references to having never disclosed a particular identity before, and would appear surprised by having made their answer. When asked if they would like to edit that response, none chose to do so. Throughout the remainder of Fall 2019 and continuing until the COVID shutdown of Spring 2020, Ross Hall participants regularly inquired about the status of the project, repeated requests for information about future opportunities to see the completed quilts, and self-reported a continuing engagement with the questions I had asked. I failed to make a specific count of the requests or follow-up inquiries, but this became an almost daily occurrence. Many spoke

to me in the following weeks to say that they had been discussing the project questions with their own friends or family members, and related the surprises they had received by those persons' answers or responses to being asked. A difference between the locations of particular interest to me is that none of the SLI interviewees cried, made future inquiry as to the status or progress of the project, or indicated that the questions had stuck with them in any way.

I feel that two experiences in particular related to Ross Hall demonstrate the emotional connection that participants formed with this project. The first is the event which happened latest. As the COVID-19 pandemic closed the state of Colorado, I was not able to see the interviewees after spring break of 2020. However, as campus began to open operations, I was recognized by one participant who approached me stating that she could not stop thinking about the questions. She had discussed the questions and her own answers with her partner, her parents, and her wider circle of friends; who then in turn answered the questions themselves and the discussions continued in this pattern. She reported that she could not "get away" from them, and much later than I would have expected was still considering her answers to them.

The second example occurred during the final interview collected. The young woman being interviewed had been aware of the project and had been within my circle of connections, but I had not approached her until after the wave of volunteers had been completed. When we finally spoke, she reported she hoped to be asked to participate from the first week of interviews, but was too shy to volunteer herself. She had been thinking about this project for almost nine months, with no established connection to it yet. Her excitement at having an opportunity to participate, and her general conversation

left me wondering if other women had wanted to be asked these questions, whom I was unaware of or had finished prior to encountering them myself. Given the number of interviews that included a respondent crying, stating that no one had ever wanted to know them before, who spoke later of continuing to discuss the questions, and continued to inquire on the projects status; it is safe to conclude that there were others who had wished to participate but the project scale restricted from doing so.

Results

The 64 interviews generated a list of 119 unique identities. *Pet Parent* is the only combined identity in this list; the identities *pet parent*, *dog mom*, *dog parent*, and *cat mom* were combined into this single entry.

Table 1 Combined Identity List

Academic	Achiever	Activist	Adopted
Advocate	African American	American	American Indian
Artist	Asian American	Athlete	Aunt
Baker	Black	Brown	Caregiver
Child of Deceased Parent	Christian	Comedian	Cousin
Crocheter	Curious	Dancer	Daughter
Day Dreamer	Disabled	Dominican American	Dreamer
Educated	Empath	Employee	Environmental Scientist
Expected to succeed	Farmer	Female	Feminist
Fighter	First Generation	Free Spirit	Friend
Gamer	Genius	Girlfriend	Good Neighbor
Graduate Student	Granddaughter	Gym rat	Happy
Helper	Hispanic	Home	Homebody
Human	Humanitarian	Immigrant	Independent
Individual	Integrity	Kickboxer	Kind
Kindness	Latina	Leader	Learner
Liberal	Love	Marginalized	Mathematician
Mentor	Mexican	Mexican American	Minority
Mormon	Mother	Musician	Muslim
Nature Lover	Nerd	Niece	Norwegian
Nurse	Overcomer	Painter	Partner
Patient	Peruvian	Pet Parent	Plus-sized
Positive Activist	Positivity/ Uplifting	Professional	Queer
Radiologist	Reader	Researcher	Scholar
Scientist	Sibling	Sister	Social Worker
Socially Anxious	Software Engineer	Spreader of Love	Step-mom
Straight	Strong	Student	Supporter
Survivor	T.V. Binger	Teacher	Team Member
Traveler	Vegan	Victim	Waitress
Wife	Woman	Woman of Color	

The five most frequent answers from the combined group were Student (50), Daughter, (47), Friend (41), Sister (39), and Woman (30). When the responses were broken out by location, the same five responses switch positions but remained the five most frequent responses. For SLI, the five most frequent were Student (25), Sister (22), Daughter (21), Friend (20), and Woman (18). In Ross Hall, these were Daughter (26), Student (25), Friend (21), Sister (17), and Woman (12). At first glance, these answers

appear to confirm the overriding messages of female identity contained in the curriculums and classroom management methods of the education system. However, when I looked beyond the strictly discrete answers and considered trends in the responses, the first most frequent response changed, shifting the previous top answers lower in the list.

Table 2 Stryker Identity List

Academic	Achiever	Activist	Adopted	Advocate
African American	American	American Indian	Artist	Asian American
Aunt	Brown	Black	Christian	Cousin
Daughter	Disabled	Dreamer	Educated	Expected to Succeed
Feminist	Fighter	First Generation	Friend	Girlfriend
Granddaughter	Happy	Helper	Hispanic	Home
Human	Immigrant	Independent	Individual	Kind
Latina	Leader	Learner	Marginalized	Mentor
Mexican	Mexican American	Minority	Mother	Musician
Muslim	Niece	Nurse	Partner	Patient
Peruvian	Pet Parent	Plus-size	Professional	Queer
Scientist	Sister	Social Worker	Straight	Strong
Student	Supporter	Survivor	Teacher	Victim
Woman	Woman of Color	Wife		

Table 3 Ross Hall Identity List

Artist	Athlete	Aunt	Baker	Caregiver
Child of deceased parent	Christian	Cousin	Comedian	Curious
Crocheter	Dancer	Daughter	Daydreamer	Dominican American
Empath	Employee	Environmental Scientist	Farmer	Female
First Generation	Free Spirit	Friend	Gamer	Genius
Girlfriend	Good Neighbor	Graduate Student	Granddaughter	Gymrat
Hispanic	Homebody	Human	Humanitarian	Individual
Integrity	Kickboxer	Kindness	Leader	Learner
Liberal	Love	Mathematician	Mentor	Mexican
Mother	Mormon	Musician	Nature Lover	Nerd
Norwegian	Nurse	Overcomer	Painter	Partner
Pet Parent	Positive Activist	Positivity/ Uplifting	Radiologist	Reader
Researcher	Scholar	Scientist	Sibling	Sister
Socially Anxious	Software Engineer	Spreader of Love	Step-mom	Student
Survivor	Teacher	Team Member	Traveler	T.V. Binger
Vegan	Waitress	Wife	Woman	

In examining the trends in responses, I considered the interview locations separately. As the emotions and levels of investment in the project appeared distinct, I

expected that trends in responses may show a similar difference, which proved true. The SLI set had a strong trend of ethnic, racial, or nationality identities. I grouped the trend into Ethnic/ Racial/ Nationality, due the uncertainty of some response intentions. With responses such as *Mexican*, *American*, or *Peruvian*, it was not always clear if the intention of was as statement of nationality or ethnicity. Therefore, I chose not to attempt to separate these, and instead grouped them into a tertiary set. When answers aligning with this trend are combined, the count jumps to 30, and constitutes the dominant answer for SLI. A similar uncertainty presented in Ross Hall. When a respondent identified as an *Artist*, or *Dancer*, or *Musician*, these could be a primary profession, or a vocation. As many of the professional identities contain a certain required level of education, references to education level were also combined into this category. The dominant trend in Ross was of profession, education level, or vocation. When these responses are combined, the Professional/ Education/ Vocation count becomes 42 for that location, and constitutes the dominant identity.

Comparing both the discrete results and these two trends between the locations reveals distinctions between the two groups. Each had the same number of individual respondents (32); however Ross Hall listed 79 unique identities to SLIs 68. Including the Professional/ Education/ Vocation and Ethnic/ Racial/ Nationality trends in the rank of responses changed the top answer for both locations, but by different margins. For SLI, the Ethnic/ Racial/ Nationality out ranked Student by 5 points, but in Ross Hall Professional/ Education/ Vocation out ranked Student by 16 points, more than three times the SLI change. The Professional/ Education/ Vocation count in Ross Hall (42) was

enough from that single location to push it into third place of combine responses, where Ethnic/ Racial/ Nationality would tie for sixth with Woman.

After identifying the strongest answers from each group, I also cross compared the trended identities against the other location to determine if there was a common pattern and again, they behaved differently. SLI presented a stronger count for the Professional/ Education/ Vocation (17) than Ross Hall presented the Ethnic/ Racial/ Nationality (4), in spite of Ross Hall also being an ethnically diverse population. In SLI Professional/ Education/ Vocation was one answer short of tying for fifth place in the top five, whereas in Ross Hall Ethnic/ Racial/ Nationality came toward the bottom of its overall responses. Adding the trend identities to the combined identity count, Ethnic/ Racial/ Nationality (34), and Professional/ Education)/ Vocation (59) make a change to the top answer rankings. While Ethnic/ Racial/ Nationality did not enter the top five, it would sit in sixth place with (34). Professional/ Education)/ Vocation (59) moved to the top of the list, followed by Student (50), Daughter (47), Friend (41), Sister (39).

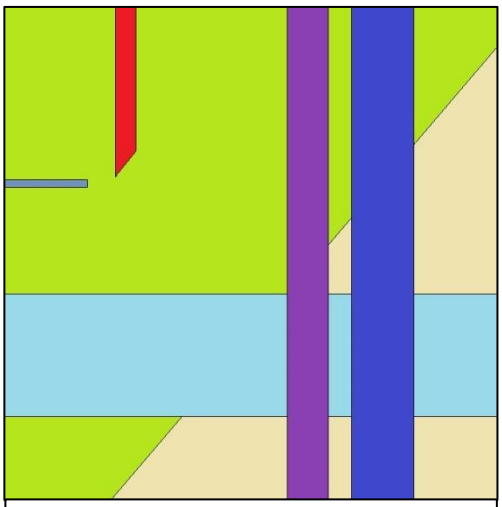

Figure 9. Quilt Block Template.
By Lisa O'Connor. May 2021.

Construction

The compiled interview responses were numbered, the order randomized, and then matched to a similarly randomized set of color and texture combinations. (See Appendix for identity color legend and a selection of individual quilt block illustrations.) A quilt block template was constructed on the computer and then individualized for each

participant according to their interview answers. The area of each color was determined by the ranking given by the interview participant, the first answer having the largest area of color, the second answer having a slightly smaller area of color, and so on. These individual blocks were printed on a specialized fabric using an Epson desktop printer, and then assembled according to interview location. Each quilt used the same set of colors and textures, so that all overlapping identities will highlight between the groups. While each block is composed such that the first identity response has the largest area of color, and the second the next largest, and so on; the interplay of colors between the primary answers and the last answers is such that the two quilts have dynamically different personalities of color.

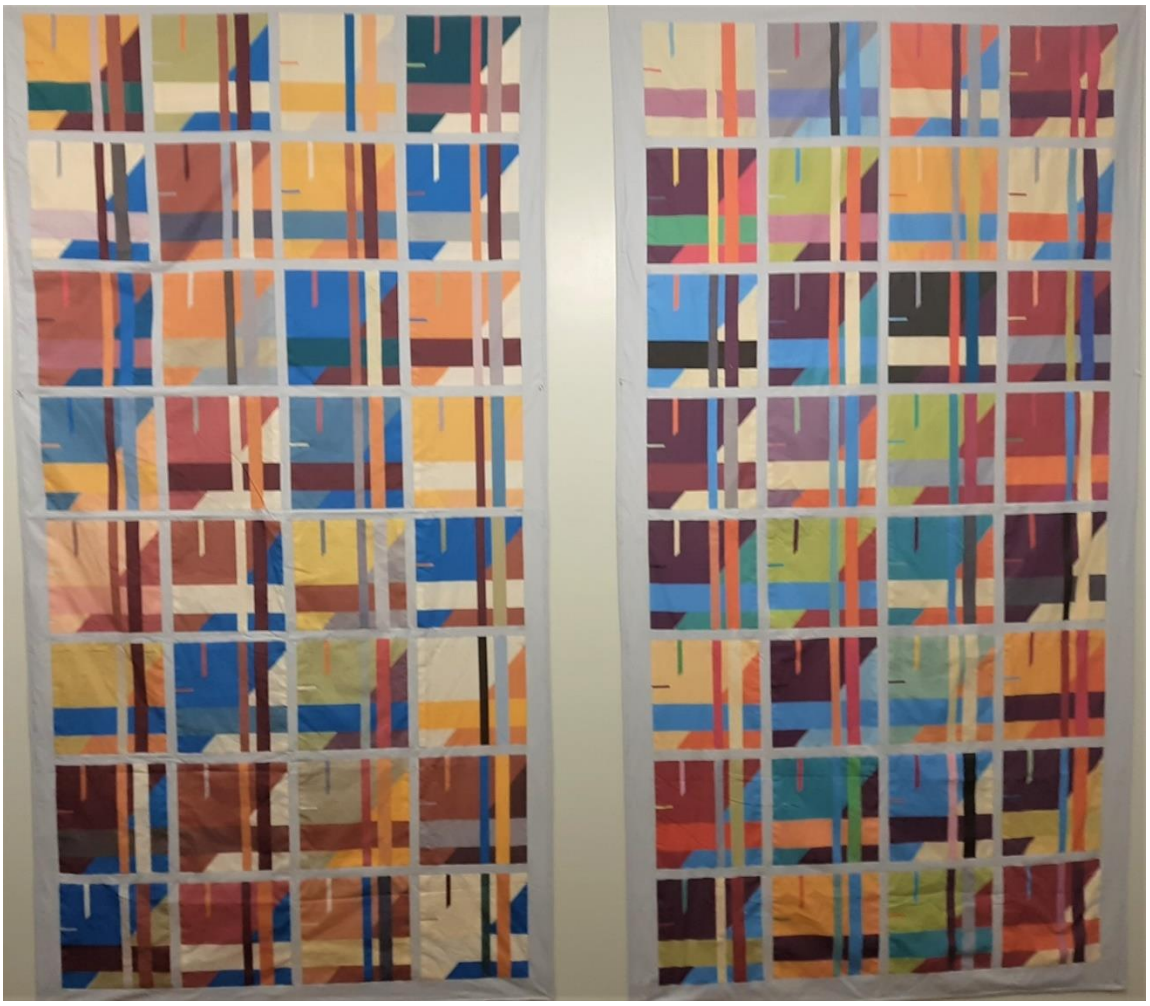

Figure 10. Stryker quilt (left). Ross Hall quilt (right)

Figure 11. Stryker quilt.

Figure 12. Ross quilt.

Conclusion

Keeping interpretation strictly to numbers, the female students surveyed for this project appear to be still adhering to, but beginning to defy, the predictive identities that the educational structure promotes. As a creative project, as a piece of cooperative art created between myself and the interviewees, it is also appropriate to consider additional factors beyond the numbers. The body language, tones of voice, tears, and follow-up of participants is also significant to the conclusions which can be drawn from this project. If a participant answered the first three questions of identity with her eyes closed, but on the fourth answer opened her eyes and expressed surprise at the word she had used, and then closed her eyes again for the remaining levels; were the answers given with her eyes shut genuine, or only read off from the social script? If a participant rapidly listed the first three, but had to question herself more deeply and then began to cry on answers four, five, six, or seven; were answers one through three genuine or socially scripted? Taking the additional factors of body language, emotional expressions, future inquiries on the project, or the absence thereof into consideration, from the position of artist and interviewer, I believe that the first few answers represent who they felt they *should* be more than who they feel they are; and that the more emotionally charged answers are who they are, or are aspiring to be, even if those identities are not fully actualized at present.

Comparing answers between the two locations again, SLI leans heavily toward group oriented and relational identities, presented fewer discrete identities overall, displayed the least emotional connection with the questions, answered the questions more quickly and without as much struggle, and presented no inquiries regarding the project or

its status. Even though I was in monthly contact with the same SLI participants throughout the Spring and Fall 2020 semesters, and Spring 2021. Ross Hall leans heavily toward individuality as well as professional, future oriented identities, participants were much more emotionally connected to the project evidenced by their independent recruitment of further participants, multiple participants made multiple inquiries regarding the project's progress, multiple participants reported further engagement with the questions, and overall Ross Hall participants displayed more emotion and deeper struggle for answers. Considering these differences, it appears that the SLI participants read off of the social script for more of the identities, and may never have broken from that conditioning; whereas Ross Hall participants appeared to move off of the social script and more fully explored the possibilities of the identities they were reporting.

Even with these differences between the locations, there remain many similarities which can be further built upon. Given the social pressures and conflicts over the past two years, there has been much media attention drawn to differences and divisions among populations in the United States. The completed quilts have different personalities, the colors react differently within the individuals and their location of interview; yet the same colors and patterns repeat across both locations. The colors of Student, Daughter, Sister, or Friend appear in differing combinations in almost every block. These are a visual reminder of an understanding and commonality between the participants, they all relate to the feelings and demands of being those identities. It will not be the solution to every social problem the campus of UNCO faces, but it is a beginning which can be explored and emphasized.

Further Study

If I were to repeat this project, I would ask the additional question of "is this who you want to be?" after completing the seven levels of "who are you, first/next?" I would likewise request the participant's age, major area of study, and personal ethnic identification. These became pieces of information that I wished to know as I processed the responses, but I had no access to as originally designed. Another change would be to record the interviews in order to make note of any repeating statements made by different participants, or to make an accurate count of repeating emotional expressions.

While this project is an applied methods creative project, it still presents interesting avenues for other researchers. A repetition of this question, at the same locations, after allowing sufficient time for change in the pool of participants, may reveal new patterns or shifts in identities. Again, followed with the addition of 'is this who you want to be?', or 'who does your community tell you that you *should* be?' The inclusion of these two questions may differentiate the socially scripted answers from their internally held beliefs. The prevalence of statements regarding a lack of being known or of a lack of persons wanting to know them is another avenue to be explored. Is this perception unique to female students at UNCO, or universal regardless of gender? Have the isolations due to COVID-19 containment measures worsened this sense of not being known, or have interactions via online platforms been sufficient to meet this need for community? Has there been a university policy or program that has fostered a sense of belonging for them, or a particular practice on the part of instructors? If this need is not being met on the university campus, is there another location where they feel they are wanted? Like the original participants, there may be multiple commonalities between

foundational identities of students which the campus community remains unaware of at an explicit level.

To be asked “who are you?” and be listened to for as long as the response required appeared to be a powerful experience for half of the participant pool, and which sparked further discussions of the topic on the UNCO campus and beyond. To widen the number of participants could spread those conversations into new pockets of the campus body. In turn, becoming aware of commonalities, intentionally discussing and building upon them, would contribute to strengthening the UNCO student community as a whole through fostering a deepened sense of each community member’s humanity and relatability. If the pattern of participants discussing these questions after the interview repeated, further research on this topic may enhance UNCOs position and integration into the surrounding community as well.

The people who compose the campus of UNCO are varied, with much potential for either conflict or community. Direct and explicit efforts to create a sense of belonging don’t appear to be as effective as the chance connections which begin the process organically. These grow and shift to better serve the emotional and psychological needs of the community members; they design it themselves as they interact. This research is neither of these, yet. But as with any expression of art there is no telling what shape it will eventually take on. Without attempting to control a final outcome the questions in and of themselves need to be asked, if only to challenge students to examine who they are becoming in a conscious way instead of conforming to who they are told they should be.

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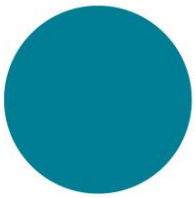
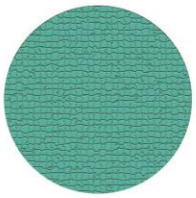
Appendix

Quilt Block Color Legend

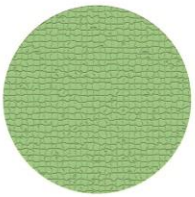


Child of
Deceased Parent

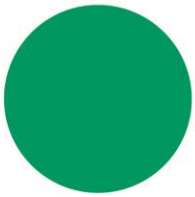


Christian

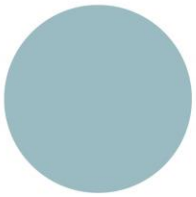
Comedian



Cousin

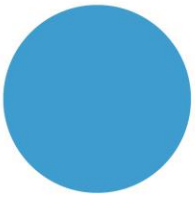


Crocheter

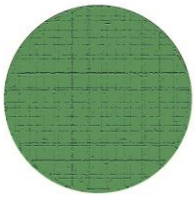


Curious

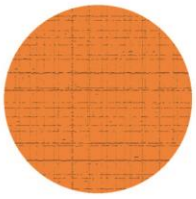
Dancer



Daughter

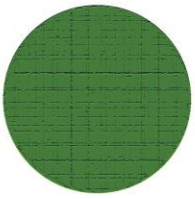


Daydreamer

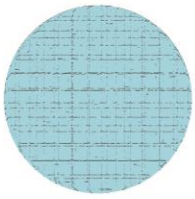


Disabled

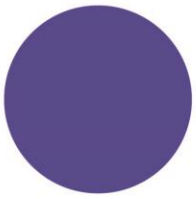
Dominican
American



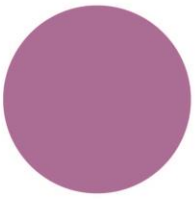
Dreamer



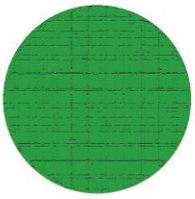
Educated



Empath

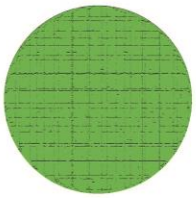


Employee



Environmental
Scientist

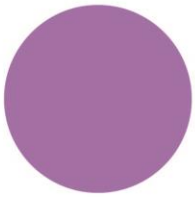
Expected to Succeed



Farmer

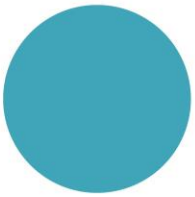
Female

Feminist

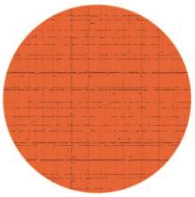


Fighter

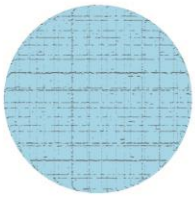
First Generation



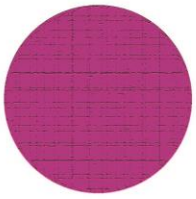
Free Spirit



Friend



Gamer



Genius

Girlfriend

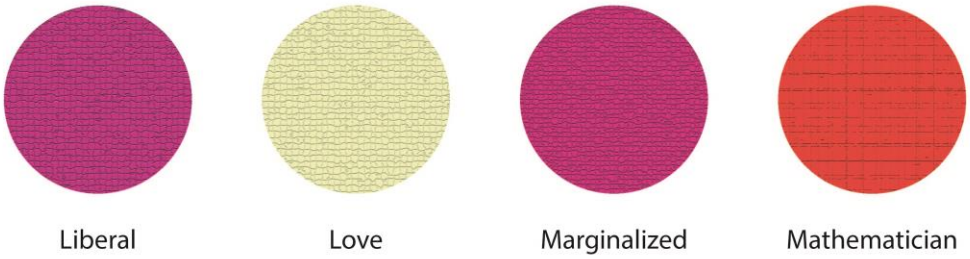
Good Neighbor

Graduate Student

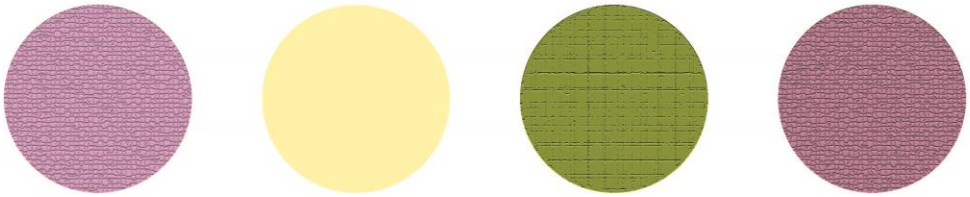
Granddaughter

Gym-rat

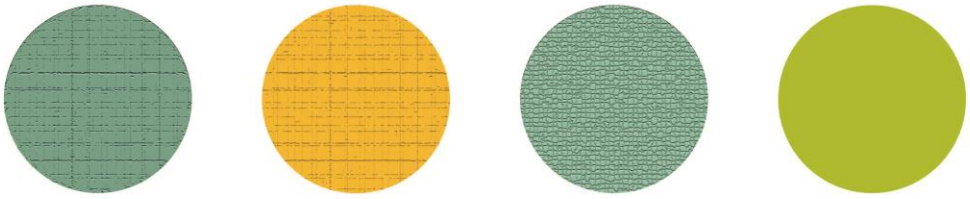
Happy



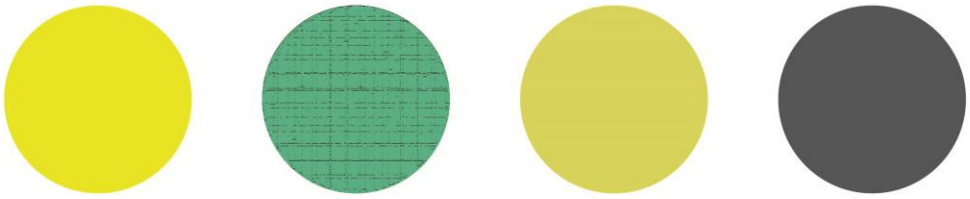
Liberal Love Marginalized Mathematician



Mentor Mexican Mexican American Minority



Mormon Mother Musician Muslim



Nature Lover Nerd Niece Norwegian


Nurse
Overcomer
Painter
Partner
Patient
Peruvian
Pet Parent
Plus-size
Positive Activist
Positivity/ Uplifting
Professional
Queer
Radiologist
Reader
Researcher
Scholar


Scientist
Sibling
Sister
Social Worker
Socially Anxiuos
Software Engineer
Spreader of Love
Step-mom
Straight
Strong
Student
Supporter
Survivor
T.V. Binger
Teacher
Team Member


Traveler
Vegan
Victim
Waitress
Wife
Woman
Woman
of Color

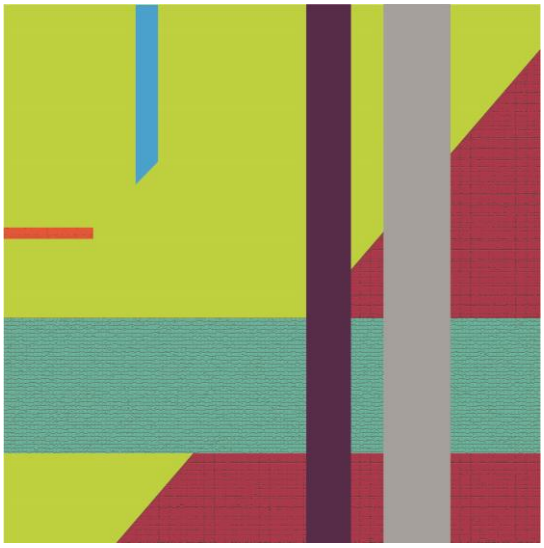


Figure 14. Ross #2. Human, Woman, Christian, Teacher, Student, Daughter, Friend.

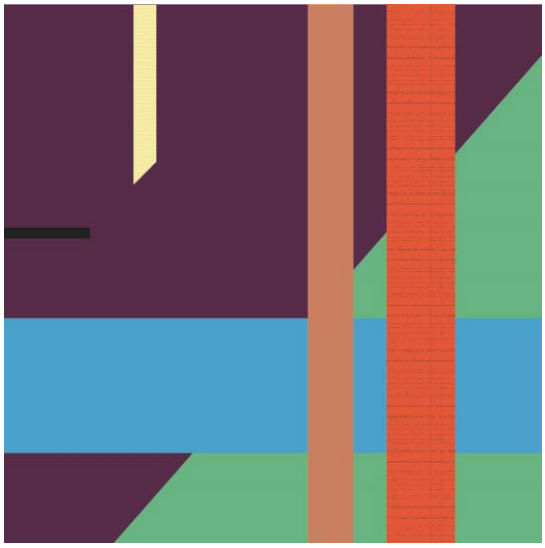


Figure 15. Ross #9. Student, Female, Daughter, Friend, Software Engineer, Sister, Pet Parent.

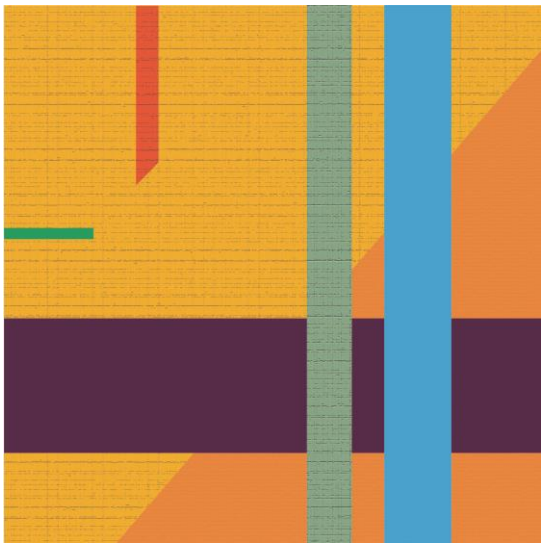


Figure 16. Ross #11. Mother, Wife, Student, Daughter, Mormon, Friend, Crocheter.

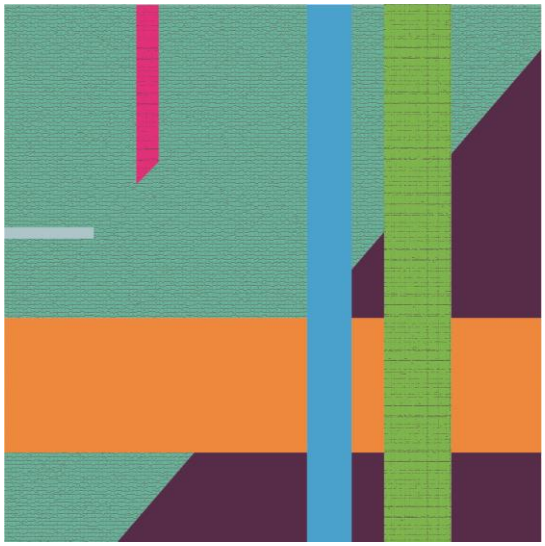


Figure 17. Ross #15. Christian, Student, Athlete, Farmer, Daughter, Artist, Curious.

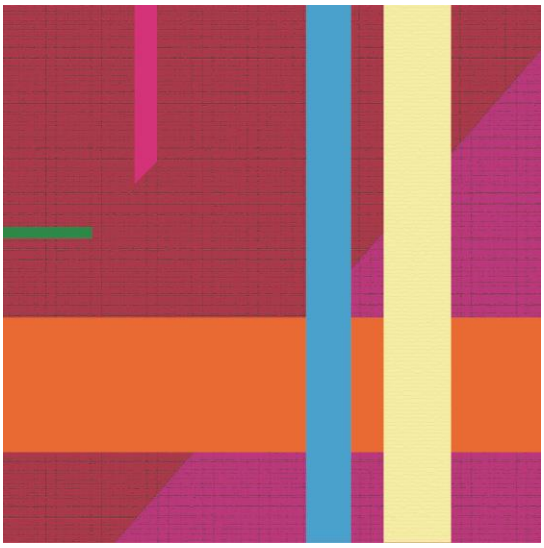


Figure 18. Ross #18. Woman, Genius, Socially Anxious, Sister, Daughter, Granddaughter, Dominican American.

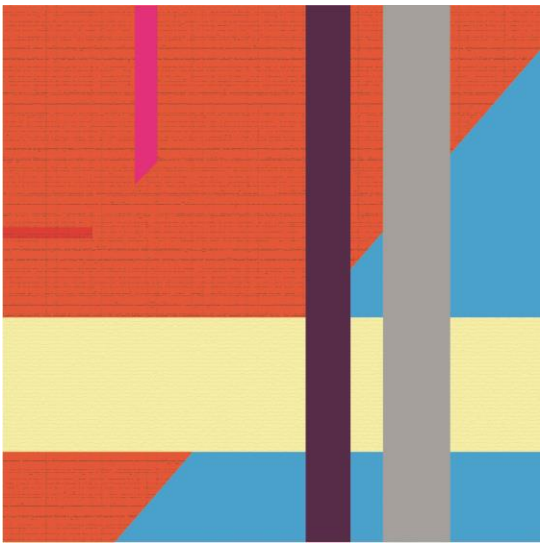


Figure 19. Ross #24. Friend, Daughter, Sister, Teacher, Student, Comedian, Mathematician.

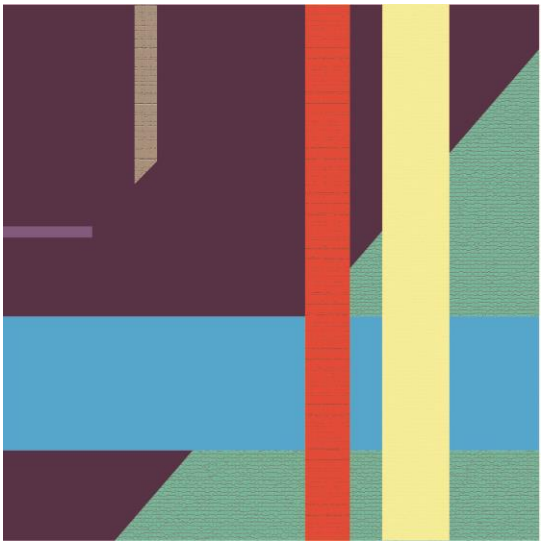


Figure 20. Ross #28. Student, Christian, Daughter, Sister, Friend, Team Member.

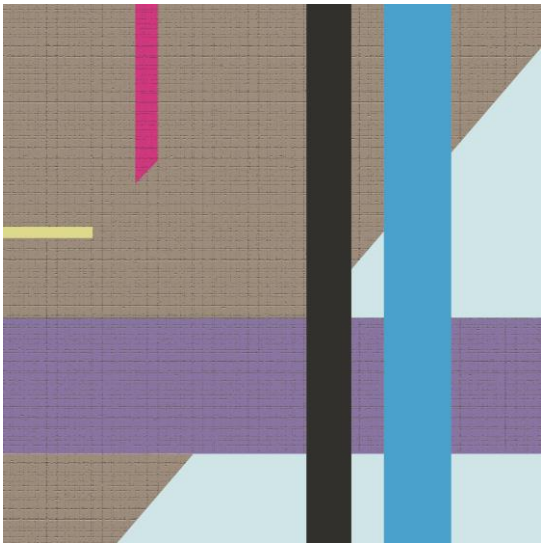


Figure 21. Ross #30. Leader, Scholar, Homebody, Daughter, Pet Parent, Positivity/Uplifting, Dancer.

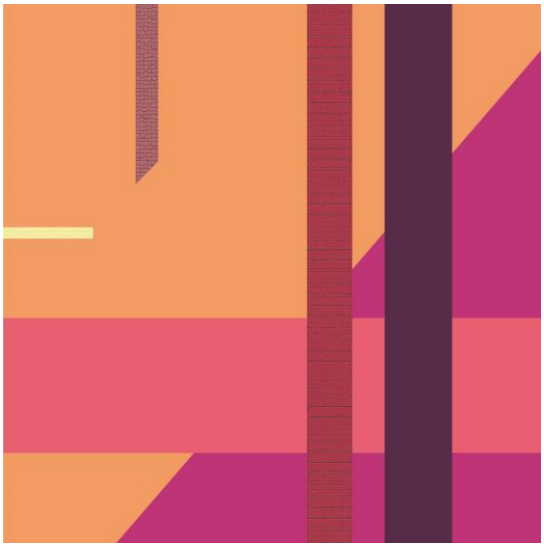


Figure 22. Stryker #2. Peruvian, Latina, American, Student, Woman, Brown, Sister.

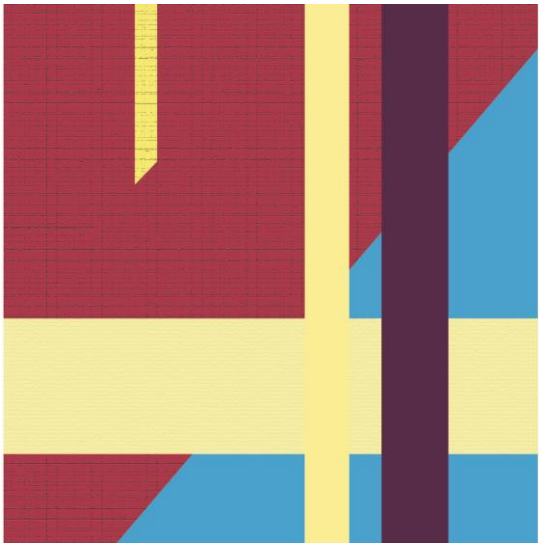


Figure 23. Stryker #9. Woman, Daughter, Sister, Student, Mexican, Achiever.

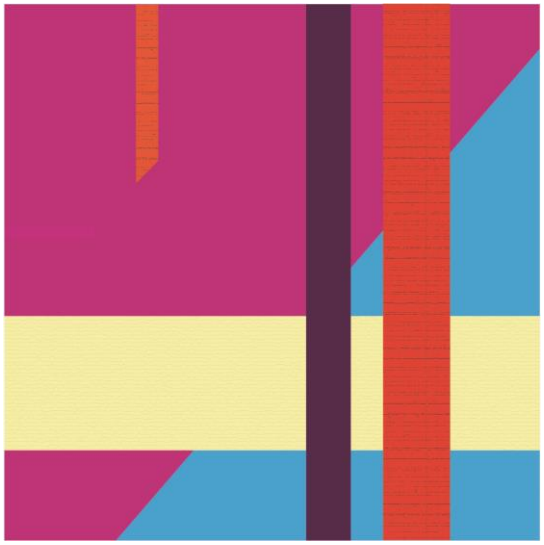


Figure 24. Stryker #11. Latina, Daughter, Sister, Supporter, Student, Friend, Expected to Succeed.

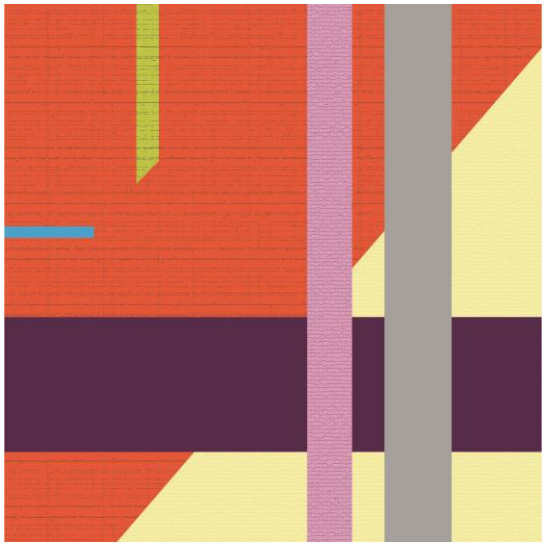


Figure 25. Stryker #15. Friend, Sister, Student, Teacher, Mentor, Mexican American, Daughter.

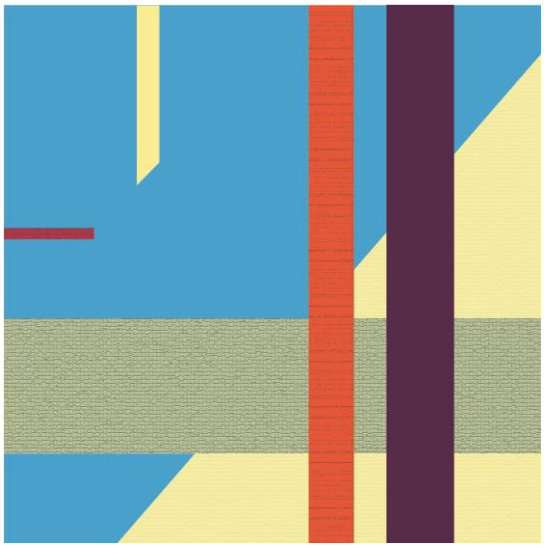


Figure 26. Stryker #18. Daughter, Sister, Nurse, Student, Friend, Mexican, Woman.

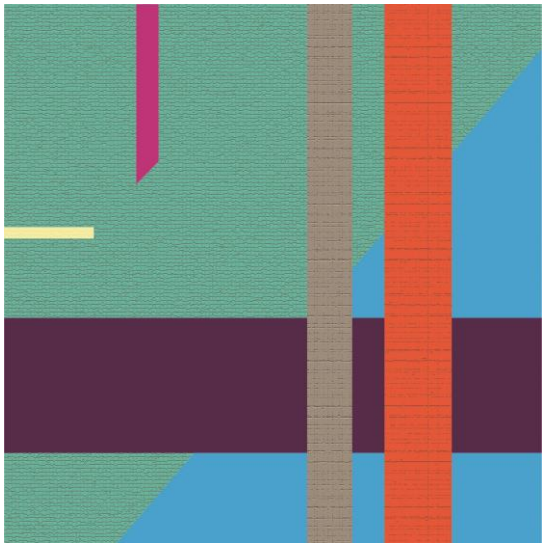


Figure 27. Stryker #24. Christian, Daughter, Student, Friend, Leader, Latina, Sister.

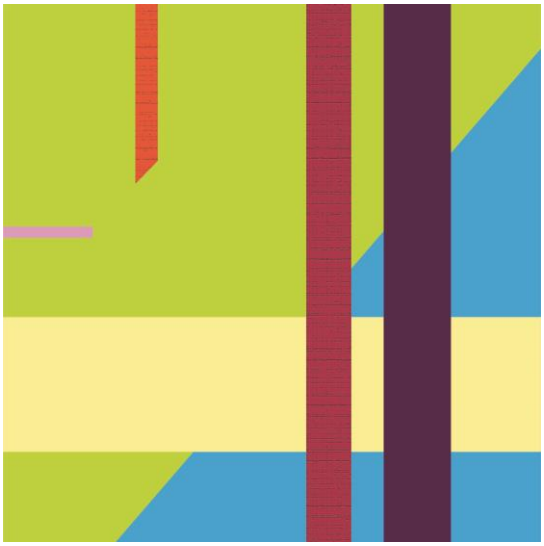


Figure 28. Stryker #28. Human, Daughter, Mexican, Student, Woman, Friend, Aunt.

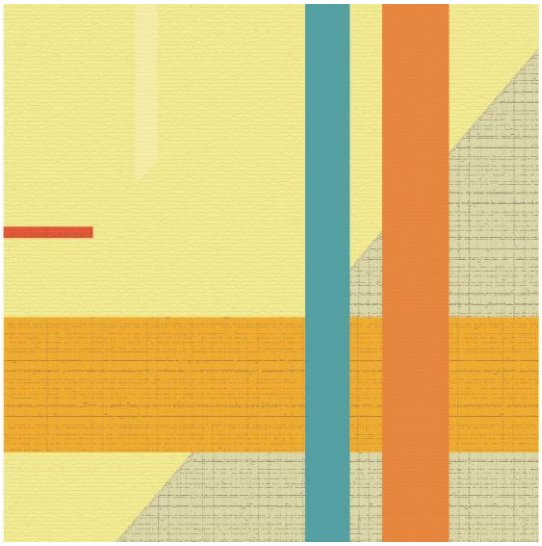


Figure 29. Stryker #30. Individual, Academic, Mother, Wife, Daughter, Sister, Friend.