

Motivation in the Apparel Classroom: A Self-determination Perspective

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ABSTRACT

The purpose of this study was to uncover strategies that apparel educators may use to encourage higher level self-regulation in foundational apparel studies. Based on the Organismic Integration sub-Theory of Self-Determination Theory, we tested whether instructors' employment of autonomy-supportive language verses traditionally used controlling language would differentially influence students' internalization of the importance of a necessary but uninteresting basic sewing task. Generally speaking, we found support that instructors' use of autonomy supportive language may increase internalization necessary to motivate students to master basic sewing skills. Theoretical, empirical, and practical implications are presented.

CHAPTER 1: INTRODUCTION

Background and Justification for the Study

The opportunities to acquire basic hand and machine sewing skills have diminished drastically over the decades having a significant impact in college classrooms on apparel design curricula. Many students enter these programs with little to no knowledge of clothing construction principles, how basic pattern shapes are used to create garments worn on the body, or how to operate a basic lockstitch sewing machine. Even relatively simple sewing skills (defined as basic sewing, repair, hemming, and button sewing) have declined over the previous generations with each generation from Baby Boomers (generally defined as those born 1946-1965), through today's students demonstrating successively less skill (Norum, 2013; Fisher, 2008). Therefore, teaching basic sewing skills has become a necessity in most apparel design programs; whereas, previously instructors had been able to rely on some student experience prior to college. Subsequently, this leaves many students struggling to learn multiple new skills simultaneously. For these students design, pattern making, and construction must be introduced, learned and mastered in parallel. Even students in design programs which allow garments to be constructed by professional sewers or who are in merchandising and marketing programs are at a disadvantage without some basic sewing knowledge, as sewing competence enhances students' abilities to understand garment structure and design (Slocam & Beard, 2005). Teachers have always known that students need to be motivated to put forth the effort to master a new skill (Prensky, 2010). The challenge in apparel classrooms is how to motivate students to master basic clothing construction skills so that they may move on to more advanced tasks.

Overview of Self-determination Theory

This study was framed using self-determination theory (Deci & Ryan, 2002). Self-determination theory purports that the satisfaction of three basic human needs motivates human behavior. These needs are defined as autonomy, relatedness and competence (Deci & Ryan, 2002). Autonomy refers to a sense of choice and control and considers the source of the behavior as either internal (participating in a task purely because of interest) or external (required participation in a task). Relatedness regards the feelings associated with being understood and connected to other individuals and/or groups. Competence is feeling confident to be skillful or interact effectively with tasks. (Deci & Ryan, 2002). The universal desire of humans to satisfy these needs is the catalyst to energize, sustain and direct behavior. These three needs must be satisfied for ongoing psychological growth, integrity and well-being. (Deci & Ryan, 2002). Support and satisfaction of these needs provides the foundation for the psychological energy to motivate and maintain positive behaviors (Ryan et al., 2008). Some people are intrinsically motivated to participate in an activity because the activity itself satisfies an innate psychological need for competence, relatedness, and autonomy. However, others may not feel the same intrinsic motivation for the activity. Realistically, expecting students to be completely intrinsically motivated toward all academic tasks, though ideal, is not a rational assumption for educators. In educational settings, it is common to require students to engage in necessary but “uninteresting” tasks (Bailey & Stanley, 2003). If apparel students do not perceive learning basic construction skills as useful or having meaningful consequences, it is reasonable to assume that there is little to no intrinsic motivation to enhance or undermine. (Deci, Koestner & Ryan, 2001). The

question then that educators must ask is “How do I motivate my students to try hard, exert their best effort and perfect a skill that may seem boring or unnecessary?” In other words, how can instructors encourage motivation which is external to the students’ locus of causality.

Integrated Regulation

According to Ryan & Deci (2002), “integrated regulation provides the basis for the most autonomous form of *extrinsically* motivated behavior” (p. 18). Extrinsic motivation must occur when an individual has no inherent interest in a task and must be motivated by some external force. Integrated regulation is the degree of extrinsic motivation in which an individual exhibits motivation for a task which is nearly the same as intrinsic motivation for the task. Assuming that students are not fully intrinsically motivated to learn basic-level sewing tasks, the author explores in this study how to move students toward the level of extrinsic motivation closest to intrinsic motivation, (e.g., integrated regulation), by improving internalization, so the students are motivated to understand the importance and value of the task. Internalization, therefore, is what instructors can potentially impact. The instructor cannot impact whether or not a student is intrinsically motivated (interested in the task) but can potentially influence the student’s degree of internalization. Integrated regulation is the closest form of extrinsic motivation to intrinsic motivation and involves the individual perceiving the locus of causality as wholly internal. At this desired level, individuals have fully accepted the values, goals, and importance of the task as their own. Therefore, integrated regulation is nearly the same as intrinsically motivated behavior. If instructors can improve student’s degree of internalization, then they may get students closer to integrated regulation which

is the highest form of extrinsic motivation before intrinsic motivation (Deci & Ryan, 2017).

Gaps in the Literature

A review of the textile and apparel literature reveals that while self-determination theory has been applied to many domains of life and education, no research has been conducted applying self-determination theory to the apparel classroom.

Purpose of the Study

The general aim of this research is to try to positively impact students' internalization of the task and move students toward integrated regulation by manipulating their feelings of autonomy, relatedness, and competence to learn the "intellectual and motor skills involved in making apparel" (Marshall, 1987). Specifically, in this study, the researcher will test an autonomy supportive strategy to motivate entry level design students toward internalization of achieving mastery of clothing construction skills. An autonomy supportive strategy uses language that provides meaningful rationale for the intended task (addresses why?), acknowledges that the task might not be interesting to everyone (reduces internal conflict that the student should do the task but may not want to), and provide some level of choice over the task (such as time spent on the task) while minimizing the use of controlling words and phrases such as "you must or you have to" (Deci & Ryan, 2000, 2002, 2017). The use of autonomy supportive language has been shown to be more motivating than using controlling language or rewards such as grades (Joussemet et al., 2004). In a meta-analysis of 184 independent data sets, Ng et al., (2012) found that behavior change is more effective and lasting when patients are autonomously motivated and autonomy supportive language was found to be

associated with increased internalization for uninteresting tasks (Joussemet et al., 2004). These findings which support autonomy supportive language are important for apparel educators as it may provide a powerful and lasting, extrinsic motivational strategy for use in the classroom to promote the mastery of boring, but necessary skills.

Therefore, the following objectives were identified for this study:

1. This research experiment will test whether students instructed to master an uninteresting but necessary sewing task with autonomy supportive language will spend more time at the task indicating a higher level of internalization versus students instructed with non-autonomy supportive language (controlling language).
2. This research will investigate whether gender, age, major, education year, sewing experiences prior to the experiment, or previous college level sewing classes are predictors of time spent to master the skill.

Organization of the Study

This proposed study will use a quantitative experimental design to test the hypothesis that students who are instructed in an uninteresting but necessary task with autonomy supportive language will spend more time to master the sewing skill than those who receive instruction with non-autonomy supportive language. This research proposes a between-subjects experimental design to compare results from two groups of apparel students that will explore autonomy-supportive strategies to enhance student motivation. The sample will be taken from college-level (born between 1995-2012) textile and apparel management, theater and art students enrolled at a large Midwestern university. These students are the target audience for implementation in the apparel construction

classroom; however, this method may be useful to enhance motivation in other fields. Participants will be given a pre and post-activity survey immediately preceding and following the experiment to collect data on demographics, interest/enjoyment – a predictor of self-reported intrinsic motivation (Deci & Ryan 1994, 2002, 2017), value/usefulness – a predictor of internalization which is related to extrinsic motivation (Deci & Ryan 1994, 2002, 2017), and perceived choice – a positive predictor of intrinsic motivation (Deci & Ryan 1994, 2002, 2017). Data will be analyzed using SPSS and STATA.

Significance of the Study

The outcome of this study will better inform predictors of student success with entry level sewing skills. If autonomy supportive language is found to increase motivation to master sewing skills, this finding would provide apparel, theatre and art instructors with a strategy to increase the quality of student performance in the apparel classroom. This additional teaching strategy would be relatively easy to integrate in the curriculum with little to no additional cost associated with the implementation. Students who are motivated to master basic skills would then be better prepared to demonstrate improved performance in upper-level courses. The study will also add to the body of knowledge by examining the possible predictors of major, education year, sewing experiences prior to the experiment, or previous college level sewing classes for basic apparel construction skill mastery.

Definitions

Autonomy supportive language. Language that provides meaningful rationale for the intended task (why?), acknowledges that the task might not be interesting to

everyone, and provides choice over the task minimizing the use of controlling words and phrases such as “you must or you have to” (Deci & Ryan, 2000, 2002, 2017).

Basic machine skill. Ability to guide material through a sewing machine following a precise, pre-determined shape.

Extrinsic motivation. The doing of an activity not enjoyable to the individual but for some external reward. The individual is motivated by an external factor such as a grade or money (Deci & Ryan, 2002).

Locus of causality. The degree to which an individual sees themselves as regulating the three behaviors of autonomy, relatedness and competence required for motivation according to self-determination theory.

Industrial lockstitch sewing machine. Type of sewing machine used industrial settings, performs only one specific stitch at speed of 5500 stitches per minute. Contrast with home sewing machine which can perform more than 50 different stitches with speed of 80-100 stitches per minute.

Integrated regulation. Final level of extrinsic motivation in the integration continuum, nearly the same as intrinsic motivation (Deci and Ryan, 2002).

Internalization. Degree to which individuals see themselves regulating the three behaviors of autonomy, relatedness and competence to fully accept the values, goals, and importance of a task as their own (Deci and Ryan, 2002).

Intrinsic motivation. The doing of an activity for the pleasure of the activity. Individuals who demonstrate intrinsically motivated behaviors participate in activities because the activity itself satisfies the innate psychological needs for competence, relatedness, and autonomy (Ryan & Deci, 2000).

Organismic Integration Theory (OIT). Sub-theory of self-determination theory which addresses an individual's motivation to participate in activities that hold no inherent interest or enjoyment for a majority of individuals (Deci et al., 1994; Deci & Ryan, 2002; Joussemet, Koestner, Lekes, & Houliort, 2004).

Self-determination theory (SDT). Theory of motivation by Deci & Ryan (2002) asserting that the three basic needs of autonomy, relatedness and competence be satisfied for optimal growth and function of human behavior.

CHAPTER 2: LITERATURE REVIEW

Challenges and Obstacles to Motivating Modern Students

The opportunities to acquire basic hand and machine sewing skills have diminished drastically over the decades, having a significant impact in college classrooms on apparel design curricula (Norum, 2013; Fisher, 2008). Many students enter these programs with little to no knowledge of clothing construction principles, how basic pattern shapes are used to create garments worn on the body, or how to operate a basic lockstitch sewing machine. Even relatively simple sewing skills, defined as basic sewing, repair, hemming, and button sewing (Marshall, 1987), have declined over the past four generations with each generation since the Baby Boomers (generally defined as those born 1946-1965) demonstrating successively less skill (Norum, 2013; Fisher, 2008). Clothing production has largely moved away from the United States in recent years contributing to the decline in sewing skill acquisition. Learning these basic skills are still relevant for apparel industry professionals who may direct, supervise and manage production overseas. Therefore, teaching basic sewing skills has become a necessity in most apparel design programs. Instructors had previously been able to rely on some student preparation prior to college. Subsequently, this leaves many students struggling to learn multiple new skills simultaneously. For these students' design, pattern making, and construction must be introduced, learned and mastered in parallel. Even students in design programs which allow garments to be constructed by professional sewers or who are in merchandising and marketing programs are at a disadvantage without some basic

sewing knowledge, as sewing competence enhances students' abilities to understand garment structure and design (Slocam & Beard, 2005).

Teachers have always known that students need to be motivated to put forth the effort to master a new skill (Prensky, 2010). The challenge in apparel classrooms is how to motivate students to master basic clothing construction skills so that they may move on to more advanced tasks. In general, students' compliance with traditional methods of classroom instruction has declined for many years (Burchfield & Sappington, 2000). Clump and Doll (2007) demonstrated that among undergraduate and graduate students just over half (54%) report compliance with reading assignments. Arquette (2010) surveyed 288 undergraduate students and found that 72.6% of students reported reading less than 2 hours per week or none at all for a 3-credit hour course. Sikorski et al (2001) found similar results with 87% of students reporting spending less than 3 hours per week on assigned readings. If students are not engaged with the course instruction, then it may be time to examine how to address student motivation to successfully convey information to this generation of students.

Motivating Generation Z

Students of the millennial generation who have grown up in a technology dependent society seem to be conditioned to expect quick and easy results. The current generation of students (Generation Z) is generally defined as individuals born from the mid 1990's to the mid 2000's and are current or future college aged students (Prensky, 2010). These students of today have used the internet since a young age, are comfortable with technology, and are accustomed to a much quicker time between learning and application (Prensky, 2010). Students know that as they learn to play a video game, they

can immediately compete with others around the world. As they learn to text, tweet and post, they can share their ideas and creations with millions in seconds. As a result of the shorter span between learning and meaningful action, motivation to perfect basic skills that require hours of practice and patience to master wanes (Prensky, 2010). In apparel classrooms where basic sewing skills are taught, there is sometimes a lag between learning a skill and applying the skill in creative apparel projects. Prensky (2010) cites scholars such as Howard Gardner in *Five Minds for the Future* (2006) and writers such as Malcolm Gladwell in *Outliers* (2008) who point to research that shows that it takes approximately 10,000 hours or 10 years to really become an expert. In the classroom, researchers have shown that teachers can barely motivate students to do an hour or two of homework.

Necessary Skills for Apparel Students

In 1987, Marshall presented a hierarchy of total learning aimed at identifying the knowledge necessary to learn clothing construction. This list of skills for apparel students is useful when planning how to facilitate the transfer of knowledge as related to clothing construction and is still relevant today as it is the main organization of curriculum instruction delivered in apparel classrooms. Marshall's sequence for teaching clothing construction skills rates 159 skills and objectives on a scale from 1-99 with 1 meaning that no other knowledge is needed prior to attempting the specified skill and 99 meaning that nearly all skills and objectives need to be mastered before attempting the skill. Ranks of skills were achieved from analysis of survey responses of 321 members of the Association of College Professors of Textile and Clothing. Items with the lowest mean scores were those skills which respondents ranked as requiring the least

background knowledge to achieve. Conversely, those items with the highest mean scores required the most knowledge and skill to achieve. The 159 skills and objectives were divided into 7 Factor groups as depicted in Table 1. The factors were then ordered according to difficulty level. 89% of Factor I items and 100 % of Factor II items were in the low difficulty group. Items in these 2 factor groups made up 75% of all items in the low difficulty group. This suggests that these skills and objectives are relevant to include in entry level construction courses and these skills provide the foundation for the more difficult factor level skills.

Table 1: Factors of Clothing Construction Skills and Objectives (Marshall, 1987)

Factors	Description
Factor I	<p>Cognitive Skills in Basic Construction</p> <ol style="list-style-type: none"> 1. Identify parts of sewing machines designed for home use 2. Identify information contained on pattern envelopes. 3. Use sewing equipment safely. 4. Describe functions a sewing equipment. 5. Identify information contained in pattern guide sheet. 6. Take accurate body measurements. 7. Identify characteristics of the figure types and pattern sizes used by pattern companies. 8. Define basic clothing construction terminology. 9. Identify size ranges and figure types used in men's, women's, and children's ready-to-wear. 10. Maintain sewing equipment. 11. Identify body measurements needed to alter a commercial pattern. 12. Identify types of shaping fabrics. 13. Select appropriate sewing equipment. 14. Identify basic principles of garment construction. 15. Use appropriate clothing construction terminology. 16. Choose notions that are compatible with fashion and design. 17. Use reliable sources of information when constructing garments. 18. Describe the functions of shaping fabrics. 19. Determine appropriate figure type and pattern size for individuals with varying body proportions. 20. Identify individual figure variations which influence choice of garment design. 21. Select patterns and fabrics appropriate for individual figure variations. 22. Identify standards for judging fabric quality.

23. Chose shaping fabrics that are compatible with fashion fabric and design.
24. Describe the influence of fabric choice on the appearance of the finished garment.
25. Identify the relationship between fabric grain and the appearance of the garment on the body.
26. Select fabrics and designs which are compatible.
27. Identify characteristics of design that result in varying visual effects.
28. Select fabrics and designs appropriate for end use of product.
29. Select patterns and fabrics according to level of ability in construction techniques.
30. Describe the influence of fabric choice on the performance of the finished garment.
31. Identify the principles of pattern alterations.
32. Judge pattern lines and shapes for varying visual effects.
33. Evaluate the relationship that exists between garment fit and fashion.
34. Discuss the relationship between fabric characteristics and garment silhouettes.
35. Compare performance characteristics of sewing equipment.
36. Discuss the relationship between the manipulative skills of the seamstress and the quality of the finished garment.
37. Select construction techniques that are appropriate for various fabrics.

Factor II

Mass Production of Apparel

1. Identify parts of industrial sewing machines.
2. Identify equipment used to produce custom-made apparel.
3. Identify characteristics of mass-produced apparel.
4. Define mass production terminology.
5. Identify equipment used in mass production of apparel.
6. Define pattern-making terminology.
7. Describe functions of industrial sewing equipment.
8. Use mass production terminology.
9. Use industrial sewing equipment safely.
10. List the steps in the mass production of apparel.
11. Identify processes involved in the mass production of apparel.
12. Use industrial sewing equipment efficiently.

Factor III

Evaluation and Decision Making in Garment Construction and Fitting

Factor IV

Apparel Design and Patternmaking

Factor V

Tailoring

Factor VI

Evaluation of Garments

Factor VII

Psychomotor Skills in Basic Construction

While conducting background research, the author also reviewed publicly available syllabi of six entry level apparel construction classes at major universities. A review of the syllabi showed that that all of Marshall's (1987) Factor I and Factor II skills were included in the entry level classes. It was observed that in the entry level classes, instructors are tasked with teaching basic sewing skills as well as more challenging techniques and providing individualized instruction for individual projects (Slocam & Beard, 2005) to modern-day students who have broadening skill levels, ranging from none to advanced. The range of student skills and the tendency expect students to be able to create an individualized project by the end of one semester presents practical challenges in entry-level apparel studio classrooms.

Furthermore, many students are coming into these classes with less experience (Norum, 2013), and possibly shorter attention spans (Prensky, 2010) which may contribute to lower motivation to perfect basic sewing skills which require hours of practice and patience to achieve professional results (Gladwell, 2005; Gardner, 2005). This may be especially true for those skills that are uninteresting, yet vital to advancing to more advanced (and more interesting) apparel design, patternmaking, and tailoring skills. If the student has no interest in the specific skill, the student by definition can have not intrinsic motivation for perfecting the skill (Deci & Ryan, 2002). Therefore, the question has to be asked, how can apparel instructors motivate students to achieve mastery of basic sewing skills for which they are not intrinsically motivated to master?

Motivating Apparel Students to Learn Basic Sewing Skills

There is little literature about how apparel educators can motivate students to learn construction skills and only a handful of researchers have published about strategies

to teach entry-level basic sewing construction skills. In one known example of manipulating teaching strategies, Slocum and Beard (2005) attempted to find out if video instruction could be a successful method to teach a specific sewing skill when compared with live instruction, but did not explore any aspect of the student's motivation to learn the skill. In their study, they developed a module of computer aided instruction to present an advanced sewing skill (inserting a zipper) and tested the effectiveness of the model against the traditional classroom lecture/demonstration mode of instruction. The computer aided instruction module was found to be an effective means to teach the skill through evaluating the finished product against a set of requirements. The computer aided design group was allowed to watch the video multiple times during completion of the task. The lecture group was presented the instruction in a traditional lecture format but was not allowed to ask questions, part of the advantage of participating in a live lecture. Significant differences in the work between the two methods of delivery were not observed and both methods were deemed to be acceptable methods of presentation for skill development. Overall, few apparel-based studies have focused on students in apparel studio classrooms. Of these few known studies, the main focus is on strategies for teaching and not on how to improve student's underlying motivation to intrinsically seek resources to better their skills. According to Deci & Ryan (2002), if people were motivated to learn these skills, their interest would cause them to seek out resources such as live instruction, video instruction or books to educate themselves. Therefore, this study intends to fill this gap by investigating an extrinsic motivation strategy to motivate entry-level design students to achieve mastery of clothing construction skills.

Theoretical Framework: Self-determination Theory

To address this aim, the researcher will use Self-determination theory described by Deci & Ryan (2002) as the theoretical framework for this study. Self-determination theory addresses human motivations for pursuing a given task. Pintrich and Schunk (2002) define motivation as, “the process whereby goal-directed activity is instigated and sustained” (p.5). Motivation is most often divided into two categories, intrinsic and extrinsic. Intrinsic motivation is defined as, “the doing of an activity for its inherent satisfactions rather than for some separable consequence. When intrinsically motivated a person is moved to act for the fun or challenge entailed rather than because of external prods, pressures, or rewards” (Ryan & Deci, 2000, p.56). Individuals who demonstrate intrinsically motivated behaviors participate in activities because the activity itself satisfies the innate psychological needs for competence, relatedness, and autonomy. Autonomous motivation emanates from one’s self as a result of interest in the subject, being challenged by the experience or a sense of personal meaning in the outcome. This is sometimes termed as “willingness” and manifests itself in phrases such as ‘I choose to and I want to...’ (Silva, et al., 2011). These individuals do not participate in the activity for an external reward such as a grade or money. The activity itself is the reward.

Extrinsic motivation occurs when humans “engage in goals or practices deemed valuable by families, groups, or societies, especially those that are not inherently enjoyable.” (Ryan & Deci, 2017, p.179) People engage in these extrinsically motivated behaviors because of the “instrumental value of the behaviors.” (Ryan & Deci, 2017, p.180) These behaviors are often associated with phrases such as “I have to” or “I

should” (Silva, et al., 2011). In these situations, the extrinsic motivator such as a grade or money is the reward, not the activity itself.

Self-determination theory purports that human motivation is more complicated than two simple distinct divisions. SDT is based on the belief that human nature is characterized by the persistent positive features of humans to establish connections with their psyche, *autonomy*; other individuals and groups in their social circles, *homonomy*; and competence (Ünlü, & Dettweiler, 2015, Deci and Ryan, 2002).

Self-determination theory asserts that optimal growth and function require three basic needs be met - autonomy, relatedness and competence. Autonomy refers to a sense of choice and control and considers the source of the behavior as either internal (participating in a task purely because of interest) or external (required participation in a task). Relatedness regards the feelings associated with being understood and connected to other individuals and/or groups (homonomy). Competence is feeling confident to be skillful or interact effectively with tasks. (Deci & Ryan, 2002).

Self-determination theory purports that the satisfaction of autonomy, relatedness, and competence motivates human behavior (Deci & Ryan, 2002). The degree to which an individual sees themselves as regulating these three behaviors is termed *internal perceived locus of causality* and is closely associated with intrinsic motivation. Likewise, individuals who feel pressured by a desired outcome exhibit an *external locus of causality* that is more closely associated with extrinsic motivation (Deci & Ryan, 2017). Stimulating an individual’s *internal locus of causality* is an important task for enhancing motivation.

Application of Self-determination Theory: General

Principles of self-determination theory have been applied to many domains of human life that require motivation including physical education (Standage, Duda, & Ntoumanis, 2005), politics (Losier, Perreault, Koestner, & Vallerand, 2001), healthcare (Williams et al, 2006, Ryan et al., 2008; Silva et al.,2011), religion (Neyrinck, Lens, & Vansteenkiste, 2005), general education (Niemiec et al., 2006), and e-learning (Roca and Gagne, 2008); however, there is no evidence in the literature of its application to foundational, college apparel production classes or textile classes in general.

Self-Determination Theory in Apparel

In the apparel field, self-determination theory principles have been used in very few studies (Freeman & McRoberts, 2013; Kozar & Connell, 2013; Oh & Choi, 2011). The studies that do mention SDT are generally only interested in intrinsic and extrinsic divisions (Freeman & McRoberts, 2013; Oh, K. and Choi, Y., 2011). No studies were identified that have used to determine if self-determination theory based external motivation classroom instruction strategies could improve student motivation toward competence in apparel skills.

Of the known studies that incorporate self-determination theory, Freeman and McRoberts (2013) investigated motivational tendencies of apparel design students with creative product output. They used Work-Preference inventory (WPI) was used for students to self-report intrinsic and extrinsic motivational elements. Students were then asked to create a three-piece ensemble inspired by a provided photo. The projects were evaluated for creativity by six “experts” using the Consensual Assessment Technique (CAT) (Amabile, 1996). Intrinsic motivation tendencies and creative output showed a

positive, yet non-significant relationship. External motivation showed a negative linear relationship but again statistically insignificant. While this study did address motivation, the researchers were primarily looking at sub-types of intrinsic versus extrinsic motivation such as autonomy, competence, curiosity, interest, reward, recognition, competition, and approval to determine if any of these subcategories would be predict higher levels of creativity in apparel design. Since none of the subcategories provided statistically significant results, the researchers concluded that the expected timeline to produce many creative pieces in a short period of time my stifle the apparel designer's creativity as compared to a professional artist who may take years to complete a piece. The researchers concluded that more research is needed into each subcategory to determine if any emerge as a key component in creative product output. This research did not test the use of self-determination principles. Self-determination theory was only used as a guide to identify categories for students to self-report levels of motivation.

In another study by Kozar and Connell, (2013) themes such as reward or approval were identified in examining college students' motivation to abstain from purchasing fashion items; however, these themes were not related to self-determination theory principles. Self-determination theory principles were used to examine intrinsic versus extrinsic factors in thrift shopping behavior of college students (Oh & Choi, 2011). Four levels of self-determined behavior (amotivation, external motivation, identified regulation and intrinsic motivation) were analyzed as predictors for thrift shopping. Intrinsic motivation and identified regulation were positively correlated while external motivation and amotivation were negatively correlated. In agreement with the tenets of self-determination theory, intrinsic motivation was significantly associated with behavioral

intentions. Interestingly, identified regulation (a form of extrinsic motivation closer to intrinsic motivation on the self-determined behavior continuum) showed the most positive correlation. The conclusion was that thrift shopping could be driven by self-determined, intrinsic motivation as well as self-determined regulation learned and internalized from past experiences or education.

While these studies all use the principles of self-determination theory, no studies were found that apply self-determination theory to student motivation to achieve competence with construction skills. Also, no studies were found that investigate the application of self-determination theory to instructional strategies that could be used in the apparel classroom.

Sub-Theories of Self-determination Theory

Interest is generally defined as personal or situational (Bergin, 1999; Renninger & Hidi, 2002). According to Renninger and Hidi (2002, p.74) personal or individual interest refers to, “a person’s relatively enduring predisposition to re-engage and persevere in work with particular content over time.” Situational interest is defined as attitudes such as enjoyment that are activated in the moment or situation. (Bergin, 1999; Renninger & Hidi, 2002). Both types of interest are associated with motivation. (Pintrich & Schunk, 2002). Some degree of interest must be present for a task for a person to be intrinsically motivated. Self-determination theory purports that a person can be extrinsically motivated by satisfying the three basic needs of autonomy, relatedness and competence toward a task that holds no interest for the individual (Deci & Ryan, 2017, 2002).

Realistically, expecting students to be completely intrinsically motivated toward all academic tasks, though ideal, is not a rational assumption for educators. In

educational settings, it is common to find students engaging in uninteresting tasks (Bailey & Stanley, 2003). If apparel students do not perceive construction skills as useful or having meaningful consequences, it is reasonable to assume that there is little to no intrinsic motivation or enhance or undermine. (Deci, Koestner & Ryan, 2001). The question then that educators must ask is “How do I motivate my students to try hard, exert their best effort and perfect a skill that may seem boring or unnecessary?” For apparel students mundane tasks such as accurately narrow hemming yards of organza used in a creative design or evenly finishing the raw edges of each seam in a garment may not be inherently interesting or appealing to the student. These skills are, however, deemed important by the instructor, a potential buyer, or a future employer. For such activities, looking at behaviors that can be externally regulated is essential. Apparel instructors could potentially improve student’s motivation to learn basic sewing skills by employing measures to externally regulate apparel students’ motivation to perfect these uninteresting tasks.

Organismic Integration Theory (OIT)

Within Self-determination Theory, there are six sub theories: a) Cognitive Evaluation Theory, b) Organismic Integration Theory, c) Causality Orientations Theory, d) Basic Psychological Needs Theory, e) Goal Contents Theory, and f) Relationship Motivation Theory. The second, Organismic Integration Theory, addresses extrinsic motivation. The second sub theory will be used in this research.

Organismic Integration Theory (OIT) specifically addresses an individual’s motivation to participate in activities that hold no inherent interest or enjoyment for a majority of individuals (Deci et al., 1994; Deci & Ryan, 2002; Joussemet, Koestner,

Lekes, & Houliort, 2004). The OIT sub theory purports that humans have a tendency to internalize externally regulated events when participating in an uninteresting task (Deci & Ryan, 2002). Internalizing externally regulated events is important as a life skill. Many tasks involved in daily life as a student or working adult are not interesting to an individual but are necessary and must be completed to be successful in the job as a whole. This is a vital skill for success for those who lack interest or intrinsic motivation for many tasks. A student required to participate in an uninteresting activity will more likely internalize the regulation of the activity if they feel a sense of relatedness to a significant other (the instructor, teaching assistant or student leader) or group, a sense of competence in completing the task, and perceive at least some autonomy (Deci & Ryan, 2002). It is important that the student perceives some autonomy, feels related to the group and feels a sense of competence to internalize the importance of a task and thus put forth the required effort to be successful at the task. These efforts might include getting up early for a class or work meeting, asking and arranging for extra assistance for a project or forgoing pleasurable activities to meet a deadline.

Internalization continuum. Internalization of externally regulated activities occurs on a continuum. The OIT sub theory of SDT proposes that extrinsic motivation can vary greatly in the degree of internalization. Internalization, sometimes termed locus of causality, is the degree to which individuals see themselves regulating the three behaviors of autonomy, relatedness and competence, which are required for motivation according to the self-determination theory. If an individual does not possess interest in an activity and therefore can by definition not possess intrinsic motivation, the activity must be extrinsically motivated or internalized. This process of internalization follows a

Extrinsic Motivation

One level above amotivation is extrinsic motivation. As illustrated in Figure 1, individuals may experience grades or levels of extrinsic motivation. (Deci & Ryan, 2002). The types of extrinsic motivation are organized according to the degree to which the subject feels they are able to regulate the three behaviors of autonomy, competence and relatedness in their environment. These levels are a) external regulation, b) introjected regulation, c) identified regulation, and d) integrated regulation. The degree to which a person's engagement in an activity is perceived by the individual as being autonomous, related and competent is a predictor of the quality of engagement or behavior in the activity (Ryan & Connell, 1989). When students perceive that their needs for self-determination (autonomy, competency and relatedness) are met, they will respond with an increase in active and meaningful engagement in the activity. Students who feel these needs are not met because of excessive extrinsic regulation from external contingencies demonstrate a decrease in meaningful engagement of the same activity. (Boggiano, Flink, Shields, Seelbach, & Barrett, 1993).

External regulation. The lowest level of extrinsic motivation in which at least some degree of motivation is present is termed external regulation. This level is defined by the lowest levels of perceived autonomy, relatedness and competence. Here individuals are motivated entirely by external factors such as receiving a reward (Deci & Ryan, 2002, 2017). The reward could be an acceptable grade or avoiding punishment which could be a poor grade (Deci and Ryan, 2002). In externally regulated motivation, the overarching feeling is pressure which often results in ambivalence. The pressure that controls or regulates the behavior can be external such as grades or rewards, or internal

pressures such as guilt or pride (Deci & Ryan, 2000). Controlling words such as “I must” or “I should” are often associated with this type of motivation. Consider the following scenario. A freshman apparel design student is given a final warning to complete all necessary projects or be eliminated from continuing in the chosen degree path. This type of external regulation results in the student successfully completing the necessary assignments to avoid the punishment of being unable to continue in the chosen degree program and delaying the completion of their degree. If the threat of punishment is removed, we would expect the student to revert back to the previous behavior of either not completing assignments at all or completing with less than acceptable skill.

Introjected regulation. Moving up the continuum, the next level of extrinsic motivation is introjected regulation. Introjected regulation is characterized by low levels of self-determination and a largely external locus of causality. Individuals with introjected regulation accept some limited value in the activity, but do not fully identify with the activity or believe in its usefulness. OIT purports that the origin of introjected regulation is largely external, with some mild feelings of guilt or obligation (Deci and Ryan, 2006). In our example, the student with introjected regulation may try a little harder because they like the teacher and do not want the teacher to be blamed for their poor performance.

Identified regulation. Identified regulation, the third level of extrinsic motivation, is a highly self-determined form of externally motivated behavior. At this level, the individual internalizes a higher value for the activity and perceives the personal importance and value of a task (Deci and Ryan 2002, 2017). This individual will now also perceive a largely internal locus of causality. Although the task is externally

regulated, the individual has adopted the goals, values and importance of the task as their own. This results in the individual with identified regulation feeling a high degree of autonomy and self-determination. Our student in the example we are following has managed to complete enough quality assignments to remain in the degree program. The instructor of the class has provided additional support and encouragement. In addition, the student had the opportunity to participate in a study tour where many of the industry leaders spoke highly of the importance of and advantage of achieving competence in clothing construction for a variety of jobs in the textile industry. This student is now beginning to realize the significance of learning to perfect construction skills.

Integrated regulation. The fourth and final level of extrinsic motivation is integrated regulation. According to Ryan & Deci, 2002), “integrated regulation provides the basis for *the most autonomous* form of extrinsically motivated behavior” (p. 18). This involves the individual perceiving the locus of causality as wholly internal This means that the student perceives that he has some choice and control over the activity (autonomy), he feels connected to the instructor or other members of the class (relatedness) and believes that he can successfully complete the activity (competence).With these three psychological needs met, the student will possess the motivation necessary to be successful at completing the task. This is the highest level of motivation that can be achieved from an external source before the individual obtains intrinsic motivation. At this desired level, individuals have fully accepted the values, goals, and importance of the task. Therefore, integrated regulation is nearly the same as intrinsically motivated behavior. It is this type of extrinsic motivation that this research aims to promote. In this study, the researchers will aim to move students to this level

using autonomy supportive language that could easily be incorporated into college level classrooms to encourage students to master entry level skills. These skills then allow the student to progress and master more difficult, challenging and rewarding skills.

Time spent engaging in the activity. The length of time students spent freely choosing to engage in an activity when given free choice time is an indicator of internalization (Deci et al.,1994). Other studies conducted by Anderson & Roden (1989) and Ryan, Koestner & Deci, (1991) have used engagement time in a free choice activity to measure internalization of the importance of an activity. In an experiment conducted by Deci et al. (1994), researchers used rationale, acknowledgement and choice as the independent variables with the dependent variable being free-choice engagement time in a repetitive computer activity. The hypothesis was that if the researchers provided subjects with a rationale for participating in the activity (“Learning this skill has been shown to be useful...”), acknowledged that the activity might “not be much fun” or might be “boring”, and used language that provided choice (“If you choose to or if you are willing to continue...”), then the subjects would spend more time working on the activity when given free-choice activity time. The results found that all three factors when used together facilitated internalization (measured as engagement time) significantly more than any one factor alone or the control group (no factors). Therefore, in this study, the main measure of internalization is time spend doing a “mundane” activity (achieving a level of skill controlling an industrial sewing machine using paper designs.) The main hypothesis of this study is that students whose psychological needs for autonomy, relatedness and competence are met through the use of autonomy supportive language

will spend longer to perfect an uninteresting task. The time spent will be an indicator of the student's internalization for the task.

Intrinsic Motivation

By the end of the second semester of working on clothing construction skills, the student in our example has secured an internship with a New York City apparel label that specifically seeks students with clothing construction competence. This student has come to the realization that these skills are useful and necessary and is now seeking out opportunities to learn advanced tailoring techniques. This student's behavior could now be classified as intrinsically motivated.

Intrinsically motivated behavior is not present for all students even in chosen career paths and related academic tasks. As previously stated, intrinsically motivated behavior can only be expected for activities and tasks that are at least somewhat inherently interesting and enjoyable for an individual. Though not realistic to expect all students to display interest toward all classes and assignments, the tenets of SDT purport that it can be expected that social factors can positively influence the behaviors of students who are required to participate in activities that are not inherently interesting. The overall goal for educators is to increase internalization in order to facilitate excellence in student work even for tasks and assignments that are not particularly interesting to the student.

Manipulating Autonomy for Improved Student Motivation

Several studies have shown the efficacy of interventions targeted at facilitating autonomy, competence and relatedness to promote positive and effortful engagement in presumably uninteresting activities (Jang, 2003; Deci et al., 1994; Joussemet, Koestner,

Lekes, & Houlihan, 2004). Of these three needs, autonomy has been identified as the most important need for extrinsically motivated behaviors to become internalized (Joussema, Koestner, Lekes, & Houlihan (2004). In a series of two experiments conducted by Joussema, Koestner, Lekes, & Houlihan (2004), researchers compared autonomy support and rewards as methods to promote self-regulation for an uninteresting computer task. As predicted by self-determination theory, the autonomy supported groups demonstrated a higher level of self-regulation while rewards showed no effect when compared to the control group.

In 2001, Deci, Koestner, and Ryan analyzed 13 studies that researched the effects of tangible rewards (e.g. prizes, gold stars, student awards, grades, etc.) on interesting and on uninteresting tasks. The focus of the investigation was the effect of these tangible rewards on measures of intrinsic motivation to participate in activities the subject did not find interesting. They revealed that tangible rewards did not undermine people's intrinsic motivation for dull tasks because there was little or no intrinsic motivation to be undermined. But, tangible rewards also failed to enhance or facilitate motivation to engage in an uninteresting activity. From an SDT perspective, the use of rewards may interfere with the internalization of an activity's value and impair self-regulation.

It is common for educators to use tangible rewards, such as grades, over less controlling techniques, especially for academic activities (Boggiano, et.al., 1987). A survey of six apparel programs at major US universities revealed that all six relied on the extrinsic reward of a grade as the primary means of external regulation. As rewards, such as grades, have been shown to be less effective in promoting internal regulation, these results suggest that it would be beneficial for educators to incorporate autonomy

supportive strategies into the classroom. Such strategies could include providing a meaningful explanation of why the activity is necessary, directly acknowledging that the task could be tedious or boring or providing choices on how the student participates in the task. Deci and Ryan argue that meeting psychological needs through autonomy supportive measures will promote autonomous self-regulation with required activities. With Self-determination theory as a foundation, Reeve (2001) proposes using strategies that encourage internalization by enhancing student autonomy in the classroom, providing competence enhancing feedback and fostering student relatedness to each other and the teacher. These are all externally regulated strategies that teachers can incorporate to address the psychological needs of the students which per the tenets of SDT enhance active engagement in activities, even if the activity itself is not inherently interesting to the student (a key element of intrinsic motivation).

Autonomy Supportive Language

To facilitate internalization students must feel autonomous in understanding why they are engaging in an activity. Self-determination theory purports there are at least three external social components to autonomy supportive language that facilitate internalization, the highest form of externally regulated behavior which instructors strive to enhance (Joussemat, 2004; Deci & Ryan, 2002; Reeve, Jang, Hardre, & Omura, 2002).

Autonomy supportive language is defined as language that provides meaningful rationale for the intended task, acknowledges that the task might not be interesting to everyone, and provides choice over the task minimizing the use of controlling words and phrases such as “you must or you have to” (Deci & Ryan, 2000, 2002, 2017). Therefore in this study, the researcher will manipulate autonomy supportive language and measure

the impact of this on time spent performing the uninteresting activity by changing the language associated with meaningful rational, acknowledgement, and choice or control over the task.

Meaningful rational. First, a meaningful rational for why an uninteresting activity is useful must be provided to the students required to participate in the activity. This aids in enhancing the student's value and personal importance for the task. Reeve et al. (2002) demonstrated that providing an autonomy-supportive rationale which clearly explained the importance of a learning activity improved students' internalization. The autonomy-supportive rationale was also associated with students' exhibiting greater efforts to learn (Reeve et al., 2002; Joussemat, 2004). When language is used to convey autonomy support, studies demonstrate that individuals' motivation and performance or learning is increased (Reeve & Tseng, 2011; Wulf, Freitas, & Tandy, 2014).

Acknowledgment. Second, the instructor may acknowledge that the task may not be interesting to all students thereby reducing the internal conflict that arises when a person is asked perform a task where no internal motivation is present (Deci, Eghrari, Patrick, & Leone, 1994). Acknowledging that the task may be of low interest reduces the tension caused by the internal conflict of being asked to participate in an activity the individual does not want to do. This acknowledgment also conveys that the instructor is concerned with the student's internal frame of reference (Ryan and Deci, 2017).

Choice or control over the task. The third strategy is to provide the student with a sense of choice and control in how he or she participates in a task (Deci, Eghrari, Patrick, & Leone, 1994). Teachers support autonomy by maximizing students' perception of choice and voice in the academic activities in which they are required to participate

(Niemic and Ryan, 2009). This is most effectively achieved by avoiding the use of controlling language such as “have to” or “must,” and instead using language such as “if you choose to continue.” Individuals who perceive some choice or control within a task, according to SDT, will report higher levels of an internal locus of causality (Deci, Eghrari, Patrick, & Leone, 1994).

Research Questions

In the context of entry-level apparel production classes, it was proposed that the majority of students would experience at least some degree of interest as these classes are required for apparel production majors. However, the problem is that some students may view achievement of competence with low interest as they do not see themselves as actually constructing garments in the future or do not internalize the importance of competence for success in future apparel production classes. Therefore, the purpose of this study was to uncover strategies that apparel educators could use to encourage higher level self-regulation in foundational apparel studies. To do so, SDT was used as the theoretical framework, specifically, the sub-theory OIT was implemented to help understand intrinsic and extrinsic motivation of students in regard to student performance in entry-level apparel construction classes. Although increasing intrinsic motivation in all students for all activities would be nice, it is a fairly unrealistic aim in a classroom environment where the course objectives and assignments are predetermined by the instructor. However, if educators can implement strategies to increase students’ external motivation to toward integrated regulation in a classroom environment, student achievement of competence should increase. The purpose of this research was to test the impact of autonomy supportive language as a strategy to facilitate college student’s

internalization of an important but uninteresting activity as guided by Self-determination Theory. Therefore, the following research questions guided this study:

1. Does autonomy supportive language affect time spent on the activity – a measure of internalization – between the test and control groups?
 - a. Tested via 2-tailed t-test
2. Does autonomy supportive language affect constructs of interest (i.e., interest and enjoyment, value and usefulness, as well as perceived choice) between the test and control groups?
 - a. Tested via 2-tailed t-test
3. Does autonomy supportive language affect quality on the sewing task between the test and control groups?
 - a. Tested via 2-tailed t-test
4. Do demographic variables of age, sex, and level in school predict which students will spend more time on the task?
 - a. Tested via multiple regression
5. Do additional factors (i.e., previous experience in TAM classes, being motivated by the ten dollar incentive, and social pressure to quit the sewing task when peers finished the task) predict which students will spend more time on the task?
 - a. Tested via multiple regression

CHAPTER 3: RESEARCH METHODS

As reported in the previous chapter, apparel design students are entering college level programs with little to no knowledge of or experience with basic sewing skills (Norum, 2013). Students of the millennial generation who have grown up in a technology dependent society seem to be conditioned to expect quick and easy results (Prensky, 2010). Many lack the motivation to perfect basic sewing skills which may require hours of practice and patience to achieve professional results (Gladwell, 2005; Gardner, 2005). This may be especially true for those skills that are uninteresting, yet vital to the completion of an end product (Deci & Ryan 2002, 2017). If the student has no interest in the specific skill, the student by definition can have no intrinsic motivation for perfecting the skill (Deci and Ryan, 2002). Therefore, the student must be extrinsically motivated regarding this particular skill. Traditionally this is done through an external source such as a grade in the class.

Educators may use strategies supported by Deci and Ryan's Self-determination Theory (2002) to move students upward along the self-determination continuum from amotivation (no motivation at all) to integrated regulation (the highest form of extrinsic motivation). If students can internalize the importance of competence in completing uninteresting or boring skills could be expected. Therefore, this research will explore if autonomy supportive language derived from self-determination theory will improve internalization toward an uninteresting task in entry level apparel design students. The uninteresting task in this proposed study is to develop proficiency and accuracy with industrial sewing machines used in the industry by sewing lines and shapes on paper.

This task is often a first-step in learning how to control an industrial sewing machine and used in many introductory apparel classrooms.

This research was conducted following a post-positivist paradigm. The post-positivist philosophy states that while we cannot be completely “positive” about our claims of knowledge when studying the behavior and actions of humans, we can determine causes which probably determine effects or outcomes (Creswell, 2009; Phillips and Burbles, 2000).

Study Design

This research was conducted with a between-subjects experimental design to compare results from two groups of apparel students that explored autonomy supportive strategies to enhance student motivation. A between-subjects experimental design was chosen for this research because it is best used for research that seeks to identify factors that influence an outcome, utilize a specific intervention or understand the best predictor(s) of an outcome and is the best way of avoiding the carry over effect of a within subjects design (Creswell, 2009). The between subjects design is the most common experimental type used in psychology (Shuttleworth, 2004) and used in studies on motivation (O’Neil, Sugrue & Baker, 1996; Houlfort, et al. 2002; Joussemet, et al 2004; Slocum & Beard, 2005; Niemiec, et al, 2006; Ng, et al, 2012). This between-subjects design measured subject’s time spent on perfecting an uninteresting, but necessary sewing task and provided insight on a strategy instructors could use to motivate apparel students to improve basic sewing skills.

Treatment for Each Group

In this experiment the test group was instructed using autonomy supportive language and the control group was instructed using controlling language. It was a between subjects' variable because subjects will be exposed to only one condition: either the "autonomy supportive" or the "controlling" condition. The two groups were treated exactly the same except for the instructions they received. Therefore, it should appear that any difference between the two conditions should be attributed to the treatment (Shuttleworth, 2009).

Autonomy supportive language group. For the autonomy supported group, the purpose of the instructions was to facilitate the participants' autonomy and internalization (integrated regulation) for the task, thereby enhancing motivation for the activity. The instructions were presented to focus students' attention on the three autonomy-supportive factors that facilitate internalization: meaningful rationale, acknowledgment, and choice or control over the task (Deci et al., 1994). This autonomy support condition was constructed after the Koestner et al. (1984) and Deci et al. (1994) experiments. The autonomy supportive group was instructed to complete the activity with autonomy supportive language. The script for this treatment group follows:

"The task you are being asked to complete is a basic sewing skill. As I am sure you are aware, competence in basic sewing skills is very important and useful for textile careers. A strong understanding and ability to execute these skills will prove useful to you whether you are interested in a product development or marketing/merchandising career. This activity will help you to improve your sewing skill competence. Some people don't think these skills are very fun and other people think they can be stressful to execute with professional results, so it is perfectly understandable that you might not be enthusiastic about this -- or maybe you are. Either way, we sincerely request that you try hard to help us understand sewing skill development. Your goal is to sew as many of the designs in your packet as you want to as precisely as you are able. This means you will start, stop and

sew along the lines on the paper without sewing off of the line. You may repeat designs to perfect them before moving to more difficult outlines if you like or you may choose to move to a more difficult design without completing the whole sheet. You may choose how much of each sheet to complete depending on how competent you feel with your skill in completing that design accurately. When you are satisfied with your competence level, meaning you feel you could complete any design accurately using an industrial sewing machine, you may stop. Please work as long as you choose to. Record the time you start on the first page of your packet and record the time you finish on the first page using the timer at your machine. After you have completed the activity, please fill out the post survey and turn in your complete packet including all designs you have sewn today to receive your incentive. Please start your timers and begin.”

Control group. The control group was given instructions to complete the activity with non-autonomy supportive language. The control group instructions used language that is commonly used in classroom when giving assignment with words such as “you have to...”, “you are required to...”, “you must...”). The script for this group was:

“The activity you will be taking is a basic sewing skill which you have to learn. You should sew the outline of the designs as precisely as you are able. This means you have to start, stop and sew along the lines on the paper without sewing too far or off of the line. You should repeat designs to perfect them before moving to more difficult outlines. You do not have to complete all the lines on a page before moving on. When you are satisfied with your skills using the industrial machine, you may stop this activity. Record the time you finish using the timer at your machine. After you have completed as many designs as you like, please bring your packet to me to fill out the post survey and turn in your complete packet including all designs you have sewn today to receive your incentive. Please start your timers and begin.”

Variables

As identified in the literature, the independent (treatment) variable in the study was autonomy supportive language (Deci & Ryan 1994, 2002, 201). Also identified in the literature, the dependent (outcome) variable was the length of time students spent

engaging in the activity when given free choice time, an indicator of internalization (Deci and Ryan, 2012; Ryan, Koestner & Deci, 1991; Pelletier, 1989).

Null hypothesis. There will be no difference in the time spent engaging in the basic sewing activity between the control group and the treatment group.

Alternative hypothesis. The autonomy supported group will exhibit longer time spent on the sewing activity than the control group.

Pre-activity/Post-activity Survey

Both groups were given pre-activity survey and a post-activity survey, with the difference being that the test group was administered the treatment. According to Shuttlesworth (2009), this research design gives the researcher tools to “filter out experimental noise and confounding variables (p. 62)” enhancing internal validity of the design by ensuring that both groups are equivalent. The pre/post survey (APPENDIX C) captured data that was used in a regression analysis to understand what factors might predict which students may be more likely to be influenced by autonomy supportive language. The survey had four sections: a) autonomy, b) internalization, c) interest level, and d) demographics. The pre-activity was used to evaluate the randomization of groups.

Autonomy. Within the survey, autonomy was measured using the *perceived choice* subscale of the Intrinsic Motivation Inventory (IMI). The IMI is a measurement tool comprised of 6 subscales used to assess participant’s subjective experience related to a target activity (Deci & Ryan, 2012). Experimenters are free to choose the subscales that are relevant to the question (Selfdeterminationtheory.org) also, past research suggests that the order of items and the use of separate subscales or all subscales has no impact on the other subscales. The IMI has been used in multiple experiments related to motivation

and self-regulation. (Deci, Eghrari, Patrick and Leone, 1994; Plant & Ryan, 1985; Ryan, 1982; Ryan, Koestner & Deci, 1991; Ryan, Mims & Koestner, 1983). The IMI subscales have been shown to be stable across a variety of tasks, conditions and settings. McAuley, Duncan, and Tammen (1987) studied the validity of the IMI and found strong support for its validity.

The *perceived choice subscale* has been shown to be a positive predictor of intrinsic motivation, whereby if people feel that they have more choice (and autonomy), then they have greater feelings of intrinsic motivation (Deci & Ryan, 1994; 2002; 2017). This subscale has 7 questions. For the purpose of this study, the perceived choice subscale was modified for the pre-activity survey using future tense. For example, the first item “I believe I had some choice about doing this activity” was modified to “I believe I will have some choice about doing this activity”. The second item “I felt like it was not my own choice to do this task” was modified to “I feel like it will not be my own choice to do this task”. The other 5 items were modified with similar future tense verbs. Past studies indicate the reliability of this subscale is adequate (i.e., Cronbach’s alpha coefficient ranges between .68 - .87, Monteiro, Mata, & Peixoto, 2015).

Internalization (OIT). Internalization was measured in the survey using the value/usefulness subscale of the IMI inventory because this subscale is considered a predictor of internalization (Deci & Ryan 1994, 2002, 2017) and often used in internalization studies (Deci et al, 1994). This subscale was used with the idea that people internalize and become self-regulating with respect to activities that they deem useful for themselves. The value/usefulness subscale was comprised of 7 questions. The internal reliability of the value/usefulness subscale has been shown to be .79 (Koka & Hein,

2003). The subscale was modified for the pre-activity survey to reflect future tense verbs. For example, the statement “I think that doing this activity is useful for me to understand a skill used in the apparel industry to produce quality products” was modified to “I think that doing this activity will be useful for me to understand a skill used in the apparel industry to produce quality products.” The other items were modified with similar future tense verbs.

Interest level. Interest level was measured in this study to gain a general reading of intrinsic motivation within the participants’ pre- and post-activity. Interest level is measured using the interest/enjoyment subscale of the IMI inventory because it is considered the self-report measure of intrinsic motivation (Deci & Ryan 1994, 2002, 2012, 2017). The interest/enjoyment subscale was comprised of 7 questions. Internal reliability is demonstrated at .88 (Koka & Hein, 2003). The subscale was modified for the pre-activity survey to reflect future tense verbs. The scale was modified as follows. The statement “I enjoyed doing this activity very much” was modified to “I think I will enjoy doing this activity very much.”

Demographics. The demographics section had 6 questions including gender, age, major, education year, sewing experiences prior to the experiment, and if they had previously taken a college level sewing course. Demographic information was used to see if any of these factors predict the outcome variable of time spent on the given task.

Quality. The quality of the completed sewing tasks was evaluated by the researcher into three categories; poor, average and excellent. The poor category was assigned if the paper was torn and more than half of the completed task was not sewn on the lines. Average was assigned if more than half but less than ninety percent of the

design was sewn on the lines. Excellent was assigned if the designs were sewn with no or very few (less than ten percent) deviations from the lines.

Procedure and Given Basic Sewing Task

On the day of the experiment, participants arrived at the sewing lab in the department of Textiles and Apparel Management. Upon arrival, participants were read an IRB-approved informed consent form per IRB guidelines and were given packet of papers. The packet included a pre-activity survey and 6 different paper sewing templates of progressively harder designs (Appendix B). Additional copies were available for students to use if requested. The researcher, two additional professional sewers, and two undergraduate novice sewers pilot-tested the sewing pages to inform the researcher about the possible range of time it would take to complete all paper templates and ensure that the easiest template was suitable for novice sewer, and the hardest template was challenging enough for the advanced sewer. The range of time to complete this activity was 31 minutes and 35 seconds to 43 minutes. The paper sewing templates were developed by Claire Shaeffer and Kathleen Fasanella (Fasanella, 2007; Shaeffer, 2012, 2001). In the classroom, the objective of these paper sewing templates are to develop accuracy and confidence and for students to learn to control the sewing machine to be able to stitch precisely at an even speed whether slow or fast (Shaeffer, 2012, 2001). This task is often the very first assignments for students in basic apparel sewing classes.

Participants were asked to fill out the pre-activity survey that included the demographic information as they waited for the experiment to begin. All participants, regardless if they had used the equipment before in a previous class, were given the same initial instruction regarding basic use of the industrial sewing machines including how to

turn on the power, use of the presser foot hand and knee lifts, foot treadle use and hand wheel use using the following script.

“The power switch is located just under the table top on the right side of the table. Please turn your machines on. The presser foot is controlled by the knee lift located next to your right knee. Please locate the knee lift and move your right knee to the right lifting the presser foot. You must raise the presser foot to position your paper for the task. If you prefer, the presser foot can be lifted and lowered by a hand lever located on the back left hand side of the machine. Please locate the hand lever. The hand wheel is located on the right side of the machine. You may use your right hand to pull this wheel toward you to position the needle up or down. To make precise turns you will want to leave the needle down in the paper and raise the presser foot to re position the paper. If you experience a problem with your machine, please stop your timer and tell me. Once the problem is resolved, you may start your timer and continue.”

Then the autonomy-supportive group was read the test group script to ensure that all students heard the autonomy supportive language instructions. This script was printed and included as the first page of the packet. Students in the control group were read the activity instructions with the non-autonomy supportive language script to ensure all students heard the controlling language instructions. This script was also printed and included as the first page of the packet. Students were asked not to talk with other students in the study during the testing time; however, were not disqualified for talking as this also mimics the true classroom environment. The majority of the students were observed to work independently on the task even if they came with one or more friends. Two or three participants were observed speaking with each other. This interaction appeared to be to compare progress and accuracy. The interactions that were observed were not disruptive to the entire group and mimicked the classroom setting. All participants started the timer when beginning the task and recorded the total time spent on the task when finished.

During the experiment, the researcher was positioned on the opposite side of the sewing lab as to not influence or reinforce the participant's length of engagement in the task. The participants self-regulated the time they spent completing the task and how many worksheets they completed. After the students finished their task, they brought the packet to the researcher at which point, the researcher gave the participant the post-survey which was completed outside the sewing machine area on the opposite side of the lab. Upon completion of the post-survey, the participants were given their incentive. Each participant was given a \$10 gift card for participation funded by a STAR research grant the author received for this project. Each group had a maximum of 1 hour to complete the task.

Sampling Procedures

Participants were recruited through a purposive sampling method. Cook and Campbell's 1979 method of deliberate sampling for heterogeneity included a set of instances chosen to reflect diversity on important dimensions even though the sample is not formally random. Kruskal and Mostellar (1979a, 1979b, 1979c) also investigated how purposive or representative sampling is used in research. One usage is that of a miniature of the population, providing a representation of the key characteristics of a desired population and ensuring that some members have that characteristic. In this case, the desired characteristic is interest in apparel production and merchandising demonstrated by enrollment in at least one textile and apparel management class.

In this study, the sample population was undergraduate students who are studying apparel design or merchandising programs or non-majors taking apparel classes. These students were appropriate in this study because they presumably have some interest in

apparel production, design, merchandising and the skills necessary to produce apparel items. Students were sought from the University of Missouri (MU), a large, land grant university. This school was an appropriate choice for the research as it is typical of the majority of college programs available to students interested in apparel production and merchandising.

The inclusion criteria for participation was age 18 or over, a college student, and an apparel merchandising major or minor. Students were recruited from lists of students who declared a major or minor in the TAM department or who are taking TAM classes. Students were excluded from the study if they had not enrolled in any classes in the TAM department or apparel production classes in the art or theatre departments.

Sample Size Requirements

Before starting recruitment for the study, the researcher determined, by an *a priori* power analysis (Lypsey, 1990) using G-Power, that there should be at least 64 members for the control and treatment group, totaling 128 participants total. The power analysis parameters were alpha = .05, power = .8 and effect size = .5 (medium) (Cohen, 1977; Lipsey, 1990) where alpha is the level of statistical significance, power is the probability that we correctly reject the null hypothesis, and the effect size is the expected differences in the means between the control and experimental groups in standard deviations. These parameters were planned so that the size of each group provided the greatest sensitivity that the effect on the outcome is actually due to the intervention in the study (Creswell, 2009). At MU there are approximately 230 textile and apparel design students from which to recruit. The recruitment methods (described below) resulted in a final sample of 59 students, which was 26 percent of possible sample participants. The actual sample size

was consistent with research that has similar aims (Leroy, 2009). Although this sample size was smaller than the target sample size, the study still yielded valid results. The implications of the smaller than anticipated sample size are discussed as limitations in the conclusion.

Participant Recruitment

Following approval by the researcher's committee, IRB approval was obtained. The researcher obtained permission to recruit from the department Chairs in the department of Textile and Apparel Management, Theatre, and Art at MU. After permission was granted from the Chairs, the researcher also sought and was granted permission from instructors in these departments to make in person announcements in classes and student organizations to recruit participants. The researcher announced the study at a department wide event, eight TAM classes, four art classes, two theatre classes and one apparel related student organization. In addition, a recruitment email (Appendix A) was sent to all students within the TAM department. The recruitment email briefly described the expectations of the participants including incentives for participation. Participants who completed the experiment received a \$10 gift card. The participant incentives were provided through funding from STAR Teaching as Research Grant from the Department of Education at the University of Missouri.

Students who were interested in participating were directed to an online sign up tool (signupgenius.com) to choose a meeting time to participate. A reminder email was sent to each participant the day before their scheduled meeting time.

Randomization of Sample

The participants chose a time to participate in the experiment from all available time slots. Each time slot had 14 openings. Each group was then assigned to a control group or treatment group alternating assignments. For example, group 1 was a control group, group 2 was a treatment group, group 3 a control group and so on. The number of participants in each group was recorded and the last groups assigned as either control or treatment to equalize the numbers in each group as far as possible. The groups were counterbalanced for time of day of the activity. For example, if a test group was scheduled at 8 am on Friday, then a control group was scheduled at 8 am on Saturday. This random assignment procedure eliminated the possibility of systematic differences among characteristics of the participants that could affect the outcomes and allows any differences in outcomes to be attributed to the experimental treatment (Keppel, 1991). The counterbalancing of the groups also eliminated the possibility that the time of day would impact the results of the experiment (Keppel, 1991).

While a purposeful selection of participants was not a true random selection, because of the randomization of the participants many scholars feel that the study design can still be considered a true experiment (Creswell, 2009; Keppel, 1991). Because the participants were randomly assigned, the groups were considered equal and no participant matching was needed (Creswell, 2009; Keppel, 1991).

The data was collected over an 8-week period (excluding Spring break from March 23-March 31, 2019) on Thursdays and Saturdays when the sewing lab was not open for student use and no supervised lab hours were available. The sewing lab can accommodate 14 students at a time. Twenty-two sessions were offered, and 12 were

conducted. The participants worked with others in the room to mimic the classroom environment thereby achieving the goals of self-determination theory (Shuttlesworth, 2006; Brewer, 2000). Apparel design students learn to use industrial sewing machines in a group setting. Any competition between students because of the group setting would also be present in an apparel design classroom.

If any equipment malfunction occurred during the experiment time, such as a needle breaking, the participant's timer was stopped while the machine was repaired and resumed when the participant is able to use the machine. There were 2 instances where participants' sewing machines malfunctioned, though these were minor malfunctions and were easily repaired. Specifically, one presser foot came off and the screw had to be tightened and one needle came out and had to be re inserted and tightened. All machines were inspected between sessions to ensure working equipment.

Experimental Data Analysis

As suggested by Shuttlesworth (2009), the researcher performed various analyses to:

1. Assess preliminary relations between primary study variables.
2. Compare the scores in the two pre-activity groups, to ensure that the randomization process was effective.
3. Compare the final posttest results on time spent on the sewing activity between the two groups, as well as participants' reported interest and enjoyment, value and usefulness, and perceived choice, along with quality on the sewing task, thereby giving an idea of the overall effectiveness of the treatment.

4. Assess whether mean scores across groups changed from pre-activity to post-activity.
5. Investigate whether demographic characteristics and other relevant constructs influence post-activity scores.

Analysis of the length of time students spent engaging in the activity (dependent variable) between the autonomy-supportive group and control group was conducted with an independent samples 2 tailed, t-test to accept or reject the null hypothesis. The two tailed, t-test was used to determine if the test condition produce a statistically significant result in with a positive or a negative direction.

A regression analysis was run to investigate whether any data collected in the survey regarding demographics (gender, grade level, or previous experience), value/usefulness (OIT/internalization), interest/enjoyment (IM), and perceived choice (autonomy) are predictors that influence the outcome variable of time spent on the given task. Regression analysis helped to understand how the value of a dependent variable changed while one independent variable changed. It was also used to understand which independent variables are related to the dependent variables. This method is widely used for prediction and forecasting (Draper and Smith, 2014). If the regression analysis identified any significant correlations between the demographic or motivational factors and the time spent perfecting the experimental task, educators could use this information to better place students in an appropriate class, offer beginning sewing as an elective class to non-product development majors or advise students of probable success or failure in beginning apparel production classes

Reliability and Validity

The between-subjects design is a useful way to ensure that an experiment has a strong level of internal validity (Shuttleworth, 2009). According to Shuttleworth (2009), this research design gives the researcher tools to “filter out experimental noise and confounding variables (p. 62)” enhancing internal validity of the design by ensuring that both groups are equivalent.

Reliability is the consistency of a research study. A measure is said to have reliability if it produces consistent results under similar conditions. In this study, reliability is ensured by using the same lab environment for all groups, reading the same script instructions to all groups, using the same person (the researcher to read the script and administer the activity) and keeping all conditions as similar as possible with all groups.

Additionally, reliance on the Cronbach’s alpha coefficient (Gliem & Gliem, 2003) is common in Social Science research, in order to assess whether measures are reliable in a particular sample. A reliability coefficient at or above .7 indicates that a measure is reliable. In the sample that was gathered for the current study, interest and enjoyment at pre-activity ($\alpha = .85$) and post-activity ($\alpha = .94$), perceived choice at pre-activity ($\alpha = .81$) and post-activity ($\alpha = .89$), as well as value and usefulness at pre-activity ($\alpha = .87$) and post-activity ($\alpha = .95$) were found to be reliable.

Anticipated Outcomes (Significance and Implications)

Based on the theory and literature review, the researcher anticipated the following outcomes of this research. According to self-determination theory, when the three needs of autonomy, relatedness and competence are met, people are more likely to internalize

or integrate an activity meaning that they realize the importance of the activity and are motivated to put forth effort to master the activity. Previous research studies have shown that when autonomy supportive language is used with activities that may be considered of little interest, people spend longer at that activity when given free choice time which is a measure of internalization. This researcher anticipated that the group instructed with the autonomy supportive language would spend longer to perfect the skill of using an industrial sewing machine.

CHAPTER 4: RESULTS

Sample Size and Characteristics

After following the recruitment protocol, we gathered a total of 59 student participants in the current study. Forty-nine participants (83%) were female, while 10 (17%) identified as male. Students' ages ranged from 16-63 ($M_{age} = 21.89$ years). For the one minor participant, parental consent was obtained. Graduate students and non-traditional students were included in the super senior category. Approximately 34% of participants were university Freshmen, 7% were Sophomores, 20% were Juniors, 29% were Seniors, and 10% were "Super Seniors" defined as those attending college/university for 5 years or more. Most participants were TAM majors (68%, $n = 40$), while a minority were non-TAM majors (i.e., TAM minors, students from Art and Theatre currently taking at least one TAM class (32%, $n = 19$).

Participants signed up for 12 of the 22 total options. Participants who signed up for the initial time slot were assigned to the treatment group. Participants who signed up for the subsequent time slot were assigned to the control group. From there, the treatment assignments were alternated. However, the final three groups were assigned to the control group in an attempt to equalize the number of participants in each group. At the end, 27 participants were in the treatment group, while 32 were in the control group. See Table 3 for information related to data collection.

Table 3. Information related to data collection.

Date	Time	Group	Number of Participants	Number of TAM majors	Number of non-TAM majors	Number of TAM 2280 students	Number of non-2280 students
Saturday, March 16, 2019	10:00 am	Treatment	7				
Saturday, March 16, 2019	11:00 am	Control	5				
Saturday, March 16, 2019	12:00 pm	Treatment	7				
Saturday, March 16, 2019	1:00 pm	Control	2				
Saturday, March 16, 2019	2:00 pm	Control	4				
Saturday, April 6, 2019	10:00 am	Treatment	10				
Saturday, April 6, 2019	11:00 am	Control	10				
Saturday, April 6, 2019	12:00 pm	Treatment	3				
Saturday, April 6, 2019	2:00 pm	Control	5				
Thursday, April 25, 2019	1:00 pm	Control	2				
Thursday, April 25, 2019	2:00 pm	Control	2				
Thursday, May 2, 2019	1:00 pm	Control	2				
<i>Autonomy Supportive language Group</i>				18	9	11	16
<i>Controlling Language Group</i>				22	10	20	12

Preliminary Analyses

Bivariate correlations between all continuous study variables, as well as means and standard deviations were estimated and are reported in Table 4. Alpha at .05 was

used to determine significance for all statistical analyses. Relevant to the primary study hypotheses, the amount of time participants took to work on the sewing task was negatively associated with having taken TAM 2280 (i.e., having taken TAM 2280 was related to less time spent on the sewing task). TAM 2280 is the first apparel production class offered at the University of Missouri and the first experience beginning sewers have with sewing techniques using industrial sewing machines. Additionally, time spent working on the sewing task was positively associated with interest and enjoyment, as well as perceived choice in group 1 and group 2 (i.e., higher reported levels of interest and enjoyment, as well as perceived choice was related to more time spent on the sewing task). It is worth briefly mentioning that interest and enjoyment in group 2, along with perceived choice in group 2 were only marginally significantly ($p < .09$) correlated with sewing task time.

Table 4. Bivariate correlations between continuous study variables and accompanying means and standard deviations.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Age	--													
2. Educ	.48***	--												
3. TAM2280	-.18	.10	--											
4. TAM2380	-.03	.35**	.55***	--										
5. TAM2480	.01	.42***	.43***	.77***	--									
6. Ten\$.11	-.02	-.03	-.01	-.01	--								
7. Quality	.04	.12	.19	.35**	.29*	-.03	--							
8. IE T1	.18	.13	-.12	.28*	.17	.34**	.01	--						
9. IE T2	.09	.22†	-.15	.09	.05	.31*	.09	.69***	--					
10. PC T1	.07	-.01	-.27*	-.09	-.10	-.02	.07	.42***	.32*	--				
11. PC T2	.18	-.07	-.14	-.06	-.11	.24†	.18	.39**	.45***	.63***	--			
12. VU T1	.09	.04	.08	.26*	.15	.19	.08	.76***	.52***	.39**	.27*	--		
13. VU T2	.14	.13	.01	.39**	.06	.29*	.14	.61***	.78***	.24†	.39**	.75***	--	
14. Time	.11	-.07	-.58***	.25†	.09	.14	.11	.23†	.29*	.36**	.25†	.09	.18	--
M	21.98	2.73	.53	.24	.17	1.20	2.11	4.95	5.46	4.01	4.27	5.85	6.03	23.46
(SD)	(7.34)	(1.47)	(.50)	(.44)	(.38)	(.41)	(.59)	(1.20)	(1.27)	(1.22)	(1.13)	(1.05)	(1.11)	(14.45)

Note: Educ = education level; TAM = textile and merchandising (course label abbreviation); IE = interest and enjoyment; PC = perceived choice; VU = value and usefulness; T1 = time 1, T2 = time 2.

† = $p < .09$ (marginal significance); * $p < .05$; ** $p < .01$; *** $p < .001$

Pre-Activity Group Differences

In order to examine whether our randomization process was effective, we explored whether there were significant group differences in pre-activity scores between the autonomy supportive language group and the controlling language group. Three separate 2-tailed independent samples t-tests were conducted (Table 5). Results indicated there were no significant pre-activity group differences in terms of interest and enjoyment $t(57) = .61, p = .5444$ and value and usefulness $t(57) = .01, p = .9896$. However, there were significant differences between groups in terms of perceived choice $t(57) = 3.32, p = .0016$, where students in the autonomy supportive language group reported initially higher levels of perceived choice than students in the controlling language group. Taken together, the randomization process used in the current study was effective in terms of two of the three constructs of interest.

Table 5. Differences in pre-activity levels of constructs of interest between the two groups.

Construct	Group	n	M	SD	t-value	df	p-value	Decision
<u>Interest and enjoyment</u>								
	Autonomy	27	5.06	.20	.61	57	.5444	Accept the null
	Controlling	32	4.87	.23				
<u>Value and usefulness</u>								
	Autonomy	27	5.85	.19	.01	57	.9896	Accept the null
	Controlling	32	5.85	.20				
<u>Perceived choice</u>								
	Autonomy	27	4.55	.20	3.31	57	.0016**	Reject the null
	Controlling	32	3.57	.21				

Note: ** $p < .01$

Results of Intervention

Time spent working on the sewing task. A 2-tailed independent samples t-test was conducted in order to assess whether differences existed between the autonomy supportive language group and the controlling language group in terms of time spent working on the sewing task. There were significant group differences, $t(57) = 4.41, p < .001$, where students in the autonomy supportive language group spent more time completing the sewing task compared to students in the controlling language group (Table 6).

Table 6 . Differences in the amount of time spend on the sewing task between the two groups.

Group	n	M	SD	t-value	df	p-value	Decision
Autonomy	27	31.33	12.42	4.41	57	<.001***	Reject the null
Controlling	32	16.82	12.22				

*Note: *** $p < .001$*

Constructs of interest. We also explored whether there were significant group differences in interest and enjoyment, value and usefulness, and perceived choice post-activity scores between the autonomy supportive language group and the controlling language group. Two separate 2-tailed independent samples t-tests indicated that there were no significant post-activity group differences in terms of interest and enjoyment $t(57) = 1.21, p = .2308$ and value and usefulness $t(57) = 1.18, p = .2436$. Because there were significant differences in pre-activity perceived choice scores between the two groups, we conducted a *change-score* 2-tailed independent samples t-test in order to assess whether changes in perceived choice scores (i.e., the pre-activity score subtracted from the post-activity score) were significantly different between the autonomy and controlling language groups. Results showed there were significant differences between

groups $t(57) = -2.17, p = .0339$, where the perceived choice scores for students in the autonomy language group remained fairly stable, whereas the perceived choice scores for students in the controlling language group positively increased from pre- to post-activity. See Table 7 for full results. Also see Figure 1 (interest and enjoyment), Figure 2 (perceived choice), and Figure 3 (value and usefulness) for visual representations of pre- and post-activity differences.

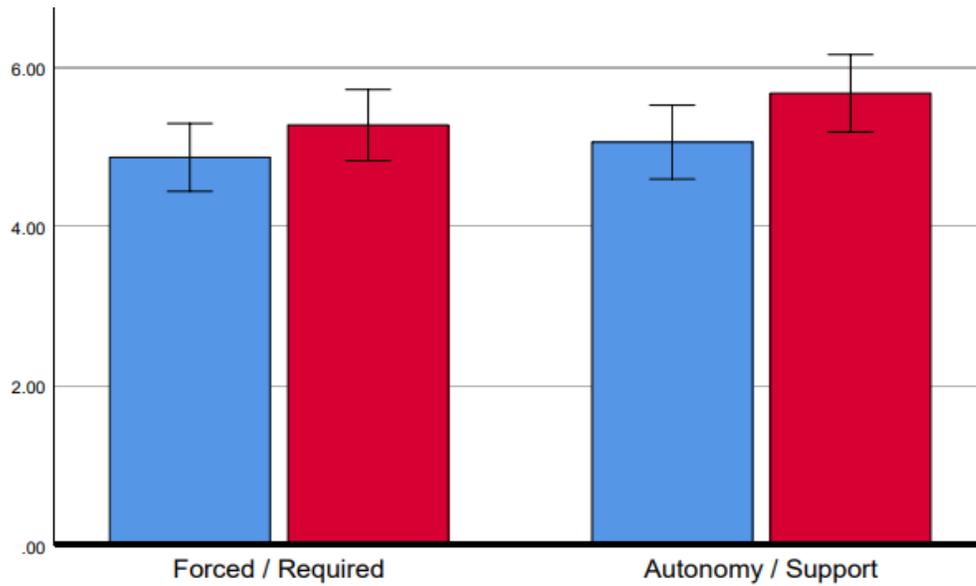
Table 7. Differences between autonomy and controlling language group post-activity levels of constructs of interest.

Construct	Group	n	M	SD	t-value	df	p-value	Decision
<u>Interest and enjoyment</u>								
	Autonomy	27	5.67	.20	1.21	57	.2308	Accept the null
	Controlling	32	5.27	.25				
<u>Value and usefulness</u>								
	Autonomy	27	6.21	.16	1.18	57	.2436	Accept the null
	Controlling	32	5.88	.23				
<u>Perceived choice</u>								
	Autonomy	27	-.05	.16	-2.17	57	.0339*	Reject the null
	Controlling	32	.51	.19				

Note: The interest and enjoyment and value and usefulness findings are based on mean differences. The perceived choice findings are based on change scores.

** $p < .01$

Figure 1. Mean differences across controlling and autonomy groups between pre- and post-activity **interest and enjoyment scores**.



Note: In this graph, forced/required is the control group. Blue is pre-activity red is post-activity with the confidence intervals showing the change.

Figure 2. Mean differences across controlling and autonomy groups between pre- and post-activity **perceived choice scores**.

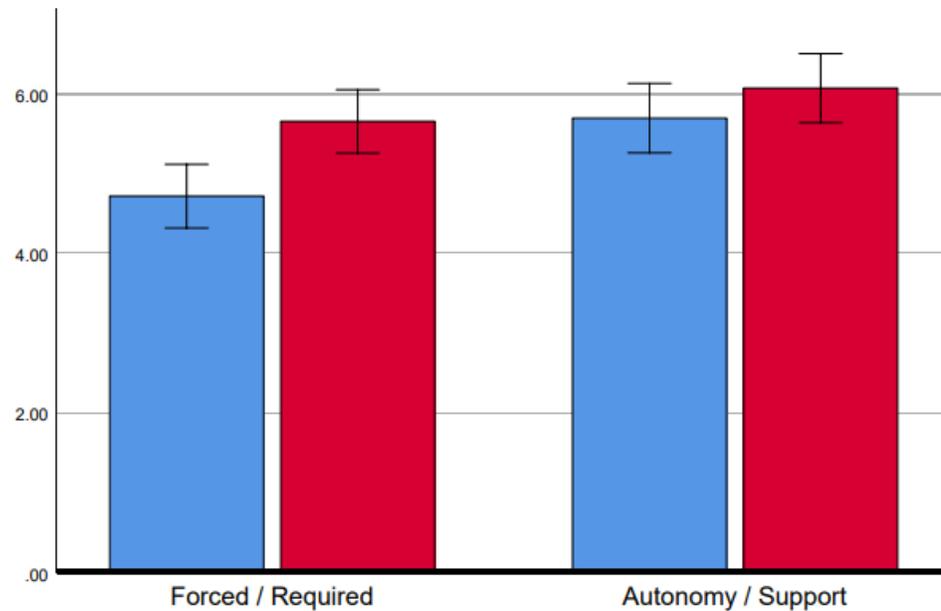
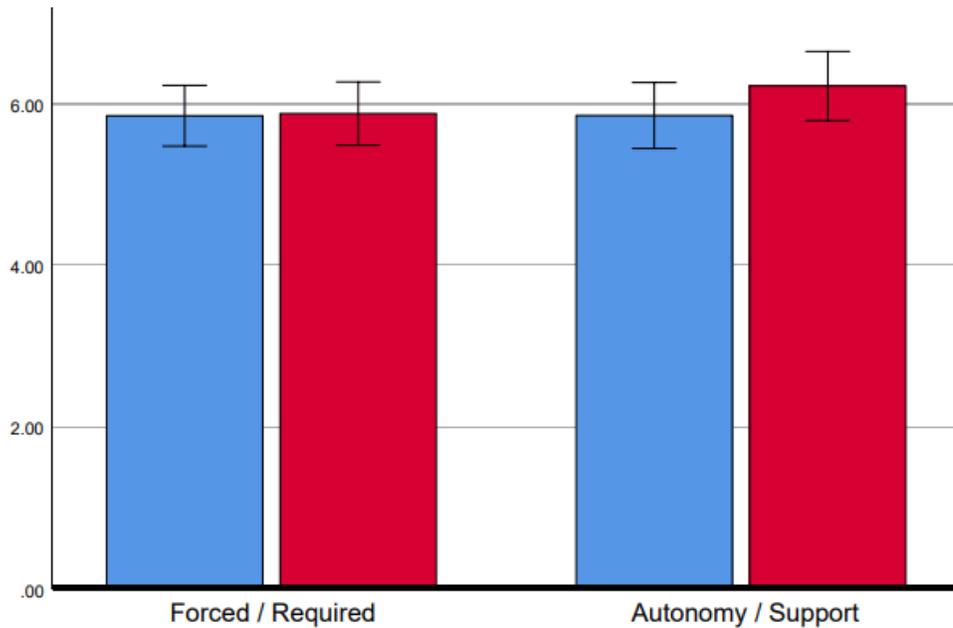


Figure 3. Mean differences across controlling and autonomy groups between pre- and post-activity *value and usefulness* scores.



Further comparison of quality on the sewing task. We further assessed the relation between group membership and quality on the sewing task. We found that once again, there were no significant differences between the treatment ($M = 2.19$) and control ($M = 2.06$) groups in terms of quality on the sewing task, $t(57) = .79, p = .4307$.

Demographic Predictors

We also chose to examine whether demographic characteristics such as student age, sex, education level, and major accounted for a significant amount of variability in post-activity scores (i.e., questionnaire completion time, interest and enjoyment, value and usefulness, perceived choice change scores, and the quality of the sewing projects that students worked on) over and above group membership. As such, a series of five multiple linear regression analyses were conducted where group membership was specified as the independent variable, students' age, sex, education level, and major were

specified as covariates, and post-activity scores were each analyzed as dependent variables. Findings from these analyses indicated that age, sex, education level, and major were not significantly associated with students' reported interest and enjoyment, value and usefulness, or the quality of their performance on the sewing task. Results also showed that age was significantly associated with perceived choice change scores. Additionally, group membership and major were significantly associated with activity completion time. See Table 8 (next page) for detailed findings. Taken together, there is little evidence that demographic characteristics influenced or contributed to students' post-activity performance.

Table 8. Associations between demographic characteristics and post-test constructs of interest.

Predictors	Model 1			Model 2			Model 3			Model 4			Model 5		
	Interest and enjoyment			Value and usefulness			Perceived choice			Questionnaire response time			Quality on sewing task		
	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>
Group	-.16	.34	.124	-.18	.30	.192	.24 [†]	.26	.066	-.52***	3.45	<.001	-.13	.16	.356
Age	.16	.03	.300	.16	.02	.293	.31*	.02	.033	.05	.26	.688	.02	.01	.916
Sex	-.07	.45	.583	.01	.40	.940	-.04	.35	.775	.07	4.56	.524	.07	.22	.612
Education	.17	.13	.255	.05	.11	.748	-.26 [†]	.10	.079	-.05	1.31	.683	.09	.06	.559
Major	.21	.35	.116	-.06	.32	.668	-.23	.27	.069	.26*	3.49	.028	-.20	.17	.140

Note: Perceived choice is specified as a change score in this analysis.
[†]*p* < .08 (marginal significance); **p* < .05; ****p* < .001

Additional Predictors

In addition to relevant demographic characteristics, we examined whether previous experience with this activity or enrollment in TAM 2280, 2380, or 2480 was significantly associated with the amount of time spent working on the sewing activity. We also investigated whether the \$10 incentive served as motivation for participation in this study, or whether having a friend or peer in the room at the time of the sewing task (i.e., a proxy social pressure if the friend or peer finished earlier than the participants) influenced time spent working on the sewing task. Three separate linear regressions were conducted in order to assess these postulates. Results revealed having taken TAM 2280 was associated with the amount of time that students worked on the sewing task, where participants who had taken TAM 2280 spent significantly less time on the activity than those who had not taken it. However, having taken TAM 2380 (second course in the apparel production sequence where students learn pattern drafting) and TAM 2480 (third course in the apparel production sequence where students learn technical design skills) did not significantly predict time. The controlling language group did have more participants, 20 of 31 (62.5%) who had taken TAM 2280 compared to the autonomy supportive language group which had 11 of 31 or 41%. The groups were essentially equal in proportion of students who were TAM majors – 69% of the controlling language group and 67% of the autonomy supportive language group. Being motivated by the \$10 incentive and feeling social pressure to leave the sewing task when one's friends or peers were finished was not associated with the amount of time participants took to work on the sewing task. See Table 9 for a full report of findings.

Table 9. Associations between additional indicators and time spent on the sewing task.

Predictors	Model 1			Model 2			Model 3		
	β	SE	p	β	SE	p	B	SE	p
TAM 2280	-.68***	3.72	< .001	--	--	--	--	--	--
TAM 2380	.25	6.09	.181	--	--	--	--	--	--
TAM 2480	-.07	6.51	.668				--	--	--
\$10 incentive	--	--	--	.14	4.66	.276	--	--	--
Social pressure	--	--	--	--	--	--	.03	2.45	.84

*** $p < .001$

CHAPTER 5: DISCUSSION

The purpose of this study was to assess whether entry level textile and apparel management students could be motivated toward internalization by manipulating their feelings of autonomy, relatedness, and competence in a way that facilitated their mastery of clothing construction skills. Below is a discussion of the theoretical, empirical, and practical implications of findings.

Extensions of Self-determination Theory

The findings of this study provided additional support for Deci and Ryan's (1994; 2000a; 2000b; 2002; 2017) Self-determination sub theory, organismic integration theory (OIT). That is, we built on a multitude of research that focuses on testing OIT in samples of workers and employees (e.g., Leroy, 2009), student athletes (Amorose & Anderson-Butcher, 2003), and college/university students (Próspero, & Vohra-Gupta, 2007), and found support for the idea that when instructors use autonomy supportive language, students are more likely to persist on an uninteresting task *and* internalize the importance of that boring task (Joussemet et al., 2004). This was one of the first studies that we are aware of which applies SDT and OIT to an authentic task that has traditionally been taught in an apprenticeship or multigenerational format. Unfortunately, learning to sew in these contexts is less common now than in previous generations (Norum, 2013). As such, understanding formal instruction of basic sewing skills is crucial in order to help students master the basic sewing skills necessary for later sewing proficiency. This postulate provides a possible means of presentation to master the skills presented by Marshall (1987).

In the current study, we applied OIT to the apparel classroom and found that students persisted longer on uninteresting task and reported greater perceived choice when they were instructed with autonomy supportive language. Examples of autonomy supportive language include, “As I am sure you are aware, competence in basic sewing skills is very important and useful for textile careers”; “Some people don’t think these skills are very fun [to learn]... so it is perfectly understandable that you might not be enthusiastic about this...[I, the instructor] sincerely request that you try hard to help us understand sewing skill development”; “You may choose how much of each sheet to complete depending on how competent you feel with your skill in completing that design accurately”. Thus, when instructors provided a meaningful rationale for an uninteresting activity, provided choices to students, and acknowledged a task as potentially boring or difficult, they had students who were more likely to demonstrate a motivation style on the external motivation continuum that is closer to integrated motivation (Deci et al., 1994; Joussemet et al., 2004). Taken together, evidence from the current study indicates that instructors can help students move toward internalization by incorporating these three autonomy supportive elements into their instruction. These findings extend OIT to the collegiate apparel classroom, which has meaningful implications, but has not been previously investigated. As such, it is important for scholars to understand how this extension of OIT can inform future research and apparel classroom instruction.

Time spent on the sewing task. In addressing the first research question, we found that the group instructed with autonomy supportive language spent significantly more time completing the sewing task. Deci and colleagues (1994), along with others (Anderson & Roden, 1989; Ryan et al., 1991) explain that increased time spent on a task

is an indicator of a higher level of external regulation, one which is more internalized than other forms. From the perspective of the current study, it is likely that when instructors incorporate the three components of autonomy supportive language (i.e., meaningful rationale, choices, and acknowledgment) into their classroom instruction, students will be more likely to internalize the importance of necessary, although potentially uninteresting or difficult tasks. In an introductory TAM apparel classroom, students are required to complete a multiplicity of tasks that are characterized as tedious and/or arduous, including sewing precise half-inch seam allowances, applying edge finishes, and replicating consistent design component (e.g., scallops). If instructors can help motivate students to internalize the importance of rudimentary sewing tasks, students will likely spend more time completing and perfecting these tasks, which will facilitate eventual mastery of basic sewing skills. In turn, students will be more successful in future classes (e.g., pattern making) and prepared to further progress toward more difficult couture skills. If students continue to internalize the importance of basic sewing skills, and ultimately more complex sewing skills, then they will eventually enter the workforce prepared and competent. Therefore, the findings of this study have salient implications for TAM instructors and students.

Differences in perceived choice. Additionally, while students in the autonomy supportive language group reported initially higher levels of perceived choice than students in the controlling language group, we found that there were differences in changes (post-activity score minus the pre-activity score) between groups, addressing the second research question. That is, students in the controlling language group had greater increases in their reported perceived choice than students in the autonomy supportive

language group. These findings were contrary to hypotheses and may be due to measurement error. As such, future research should seek to replicate and therefore strengthen these findings

Interest and enjoyment non-findings. Also, while addressing research question 2, and contrary to hypotheses, we found that the two language groups did not differ in their reported levels of interest and enjoyment from pre-activity to post-activity. Research suggests the interest and enjoyment measure is intended to capture individuals' levels of intrinsic motivation (McAuley et al., 1989); however, participants in the current study were *externally* motivated by instructors' direction styles. Therefore, findings are less surprising when considered in the context of the idea that students' intrinsic motivations were unlikely altered by exposure to a short-term, externally-oriented intervention. Further, though students in the autonomy supportive language group might not have reported statistically significant increases in interest and enjoyment (i.e., intrinsic regulation), it is possible if not probable that students moved toward internalization on the motivation continuum, which is the closest form of external regulation to forms of internal (e.g., intrinsic) motivation (Deci & Ryan, 1994; 2000a; 2000b; 2002; 2004). Future researchers might consider analyzing whether instructors' use of autonomy supportive language use in TAM university classrooms facilitates students' internal regulation *over time*.

Value and usefulness non-findings. Similarly, while further investigating research question 2, we found there were no statistically significant differences between the autonomy supportive language group and the controlling language group in terms of reported value and usefulness. Perhaps these non-findings are tied to our measure of

value and usefulness. More specifically, our measure was intended to capture the importance students placed on the sewing activity in terms of their sewing development and competence. In the context of other findings that revealed that students who had previously taken a course that included a very similar task (TAM 2280) spent less time completing the task, findings suggest that students may have already understood the value of the task prior to participating in the study. Or, it could be that not all participants are product development students who plan to move toward more advanced sewing techniques. As such, marketing and management students might not have understood or placed value on the production skills emphasized in this study, which conflated the findings of the current study. Future researchers should seek to better understand whether students place value on academic tasks that may be uninteresting or boring when instructors use autonomy supportive language, both in the short-term and long-term.

Comparison of Quality on the Sewing Task

When addressing research question 3, we discovered some noteworthy non-findings that are worth briefly discussing. That is, we found no significant differences in quality on the sewing task between the two groups, which was contrary to hypotheses. However, the quality of students' performance on the sewing task was evaluated very generally (into three categories: poor, average, and excellent) because assessing quality differences was not included as a primary study objective. Future researchers might consider employing a more validated measure of task quality in future studies, in order to illuminate these findings.

Demographic Predictors

In order to assess research question 4, we analyzed demographic factors (i.e., age, sex, education level, and major) as predictors of the amount of time students spent on the sewing task, constructs of interest, and the quality of the sewing project, in order to assess whether these predictors accounted for a significant portion of variability in these outcomes. Results revealed that no demographic characteristics help explained variability in interest and enjoyment, value and usefulness, or the quality of the sewing project. Put simply, these findings suggest that differences (or similarities) between groups on these outcomes can be accurately attributed to the treatment condition in which participants were placed.

Findings also revealed that age was significantly associated with changes in perceived choice from pre- to post-activity, where older students reported greater increases their levels of perceived choice than younger students. It is probable that older students have more experience making autonomous decisions and motivating themselves to progress on their work compared to younger students, as are likewise appreciative of and responsive to autonomy supportive instructors. Additionally, students' majors (i.e., textile and apparel management versus non-TAM majors) influenced their time spent on the sewing task, where non-TAM majors took longer to complete the sewing task than TAM majors. This is likely because non-TAM did not have as much prior hands-on sewing experience as TAM majors at the beginning of the current study. Despite these differences, major did not influence constructs of interest or the quality of students' sewing projects, suggesting that allowing students from other majors to enroll in apparel management classes is beneficial to all students. Therefore, we suggest that universities

continue to allow both apparel management students and students from other majors to enroll in apparel design courses, in order to improve their sewing skills and apparel expertise.

Additional Predictors

Finally, when testing research question 5, we assessed whether being motivated to participate in the study because of the ten-dollar incentive, or whether students feeling influenced to quit the sewing task early when peers or friends finished earlier than themselves affected outcome variables. Results showed that neither of these constructs influenced time spent on the sewing task, constructs of interest, or the quality of the sewing project. Therefore, participants in the current study were not likely biased in terms of their work on the sewing task, or their performance on the questionnaire. Further, findings showed that participants feeling the need to quit the sewing project when their peers and friends finished the sewing project did not influence their measured behaviors and motivations. Paired together, we are more confident in the findings and implications of the findings of the current study.

CHAPTER 6: CONCLUSION

Summary

Typically, instructors in college and university settings use controlling language (e.g., “You must sew these components together”; “You must use this technique”) when instructing students in basic apparel production. Though some students respond adequately to this type of instruction, some students remain unable or unmotivated to fine-tune basic sewing skills. This study sought to better understand instructing processes that lead to apparel students’ motivation. Therefore, the researcher applied theorists’ and scholars’ work on external motivating factors within an OIT framework (Deci et al., 1994; Deci & Ryan, 2002; Joussemet et al., 2004) by testing the utility of that application using a sample of TAM university students. This study applied pedagogical theory to the instruction of potentially boring or difficult but necessary tasks, in order to improve student internalization. We are unaware of any research that aims to apply the tenets of SDT to the apparel classroom. The research procedure consisted of comparing a treatment group (instructed using autonomy supportive language) and a control group (instructed using traditionally controlling language). The groups were given pre- and post-activity assessments that analyzed their motivation related to mastering basic sewing skills. Students also completed a basic sewing task using an industrial sewing machine as part of the study. In addressing research question 1, we found that students who experienced autonomy supportive language in the study resulted in students spending more time completing the sewing task, and reporting greater increases in perceived choice. In accordance with research question 2, the findings suggested that students who experienced autonomy supportive language did not necessarily report higher levels of

perceived interest and enjoyment or value and usefulness. While addressing research question 3, we found that students who experienced autonomy supportive language did not necessarily produce a better-quality product during the sewing task. And in line with research questions 4 and 5, we discovered there were no differences in these outcomes based on demographic variables (i.e., age, sex, education), previous experience in most TAM classes (i.e., TAM 2280 was the exception), being motivated by the ten-dollar incentive, or being influenced to quit the sewing task early when peers or friends finished earlier than oneself. These results were mostly in line with proposed hypotheses, which suggested that students instructed with autonomy supportive language would spend more time completing the sewing task, which represents internalization. Findings that indicated that having taken TAM 2280 was associated with taking less time on the activity could be due to the fact that a greater number of students who had previously taken TAM 2280 were in the control group.

Implication and Contributions

Instructors should be aware of the extensions of OIT presented in the current study, as well as the associated practical applications. For all potentially uninteresting or boring assignments and tasks that apparel instructors require students to complete, a thorough explanation that includes the three components of autonomy supportive language (i.e., providing a meaningful rationale, acknowledging the task as potentially difficult or boring, and providing appropriate choices to students) should be used whenever possible. Using the tenets of OIT and the three components of autonomy supportive language provides an inexpensive, relatively easy-to-implement strategy to promote motivation toward and mastery of these necessary skills. Specifically, in

product development courses, mastery of the industrial sewing machine would produce high quality garment construction outcomes. If students are motivated to master initial basic, but boring skills, future projects will be of higher quality and students will have the tools to create and master increasingly difficult pattern designs which require precise construction techniques. This project is significant as it is the first to apply self-determination theory to the apparel classroom and specifically to the skill to use an industrial sewing machine. Potential future applications could include use of self-determination theory principles to other apparel production skills such as hand sewing techniques, precision with pattern drafting, or fitting techniques. This simple solution to use autonomy support language could provide educators with a tool to improve curriculum instruction and outcome and provide students with a positive, enjoyable classroom experience where they are truly inspired and motivated to perfect boring skills and are rewarded with high quality outcomes and ultimately success in the apparel industry. Instructors in apparel classrooms may benefit from pedagogical trainings that help them to incorporate a meaningful rationale, acknowledge a required task as boring or difficult, and provide choices to students whenever possible, in order to meet students' basic needs of autonomy, and therefore motivate them to internalize the importance of basic sewing tasks.

Limitations and Future Directions

This study was not without limitations. First, the sample was not perfectly representative of all TAM college and university students. As such, future researchers might seek to conduct a similar study with a more diverse sample, in order to broaden the findings of the current study. Second, our sample size was limited in that we were unable

to recruit as many students as the power analysis indicated were necessary, leaving our analyses somewhat underpowered. This was likely rooted in the fact that college students are busy, and are not necessarily interested in participating in a voluntary research study. Researchers should continue to aim to conduct apparel classroom research on larger sample sizes in the future. Third, the assignment procedure used to place participants in a study condition (i.e., either autonomy supportive language group or controlling language group) was not completely randomized given that the participants chose their own time when signing up and then the groups were alternated. Although this limitation was somewhat addressed by pre-activity difference scores that revealed minimal initial differences between groups, future research should seek to employ more effective randomization processes in their research. And fourth, this study primarily addressed only one of the three primary facets of Self-determination Theory, namely autonomy. As such, future research should test the role of relatedness and competence in increasing internalization in sewing competence. Despite these limitations, the current study provided future researchers with important avenues for study, and illuminated salient guidelines for teachers, which include using autonomy-supportive language when possible.

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APPENDIX A

Recruitment materials used in the current study: Email and verbal recruitment statement.

Hello Textile and Apparel Management Students,

I am personally inviting all Textile and Apparel Merchandising students, Theatre, Art and hobby sewers to participate in a research study conducted by me, Claudine Barner, a graduate student investigating motivation in apparel classrooms. These skills are applicable to many careers in all of these areas. I am seeking 130 students for this research. If you choose to participate in this research you will be asked to come the Gwynn Lab and complete a simple sewing task related to textile and apparel management majors. No prior sewing experience is necessary to participate. Students will all levels or no experience at all are welcome. The experiment will take no more than 1 hour and will require you to complete a short pre and post survey and to complete the task. If you complete the survey and the task, you will be compensated with a \$10.00 gift card. All participation is voluntary and you are free to withdraw at any time. You may sign up to participate in the study on Signup Genius. If you have question or concerns about this study, please contact me at ceb664@mail.missouri.edu.

Claudine Barner

Department of Textile and Apparel Management

University of Missouri - Columbia

APPENDIX B

Autonomy supportive language activity instructions provided to students.

The task you are being asked to complete is a basic sewing skill. As I am sure you are aware, competence in basic sewing skills is very important and useful for textile careers. A strong understanding and ability to execute these skills will prove useful to you whether you are interested in a product development or marketing/merchandising career. This activity will help you to improve your sewing skill competence. Some people don't think these skills are very fun and other people think they can be stressful to execute with professional results, so it is perfectly understandable that you might not be enthusiastic about this -- or maybe you are. Either way, we sincerely request that you try hard to help us understand sewing skill development. Your goal is to sew as many of the designs in your packet as you want to as precisely as you are able. This means you will start, stop and sew along the lines on the paper without sewing off of the line. You may repeat designs to perfect them before moving to more difficult outlines if you like or you may choose to move to a more difficult design without completing the whole sheet. You may choose how much of each sheet to complete depending on how competent you feel with your skill in completing that design accurately. When you are satisfied with your competence level, meaning you feel you could complete any design accurately using an industrial sewing machine, you may stop. Please work as long as you choose to. Record the time you start on the first page of your packet and record the time you finish on the first page using the timer at your machine. After you have completed the activity, please fill out the post survey and turn in your complete packet including all designs you have sewn today to receive your incentive. Please start your timers and begin.

APPENDIX B2

Controlling language activity instructions provided to students.

The activity you will be taking is a basic sewing skill which you have to learn. You should sew the outline of the designs as precisely as you are able. This means you have to start, stop and sew along the lines on the paper without sewing too far or off of the line. You should repeat designs to perfect them before moving to more difficult outlines. You do not have to complete all the lines on a page before moving on. When you are satisfied with your skills using the industrial machine, you may stop this activity. Record the time you finish using the timer at your machine. After you have completed as many designs as you like, please bring your packet to me to fill out the post survey and turn in your complete packet including all designs you have sewn today to receive your incentive. Please start your timers and begin.

APPENDIX C

General sewing machine instructions provided to participants.

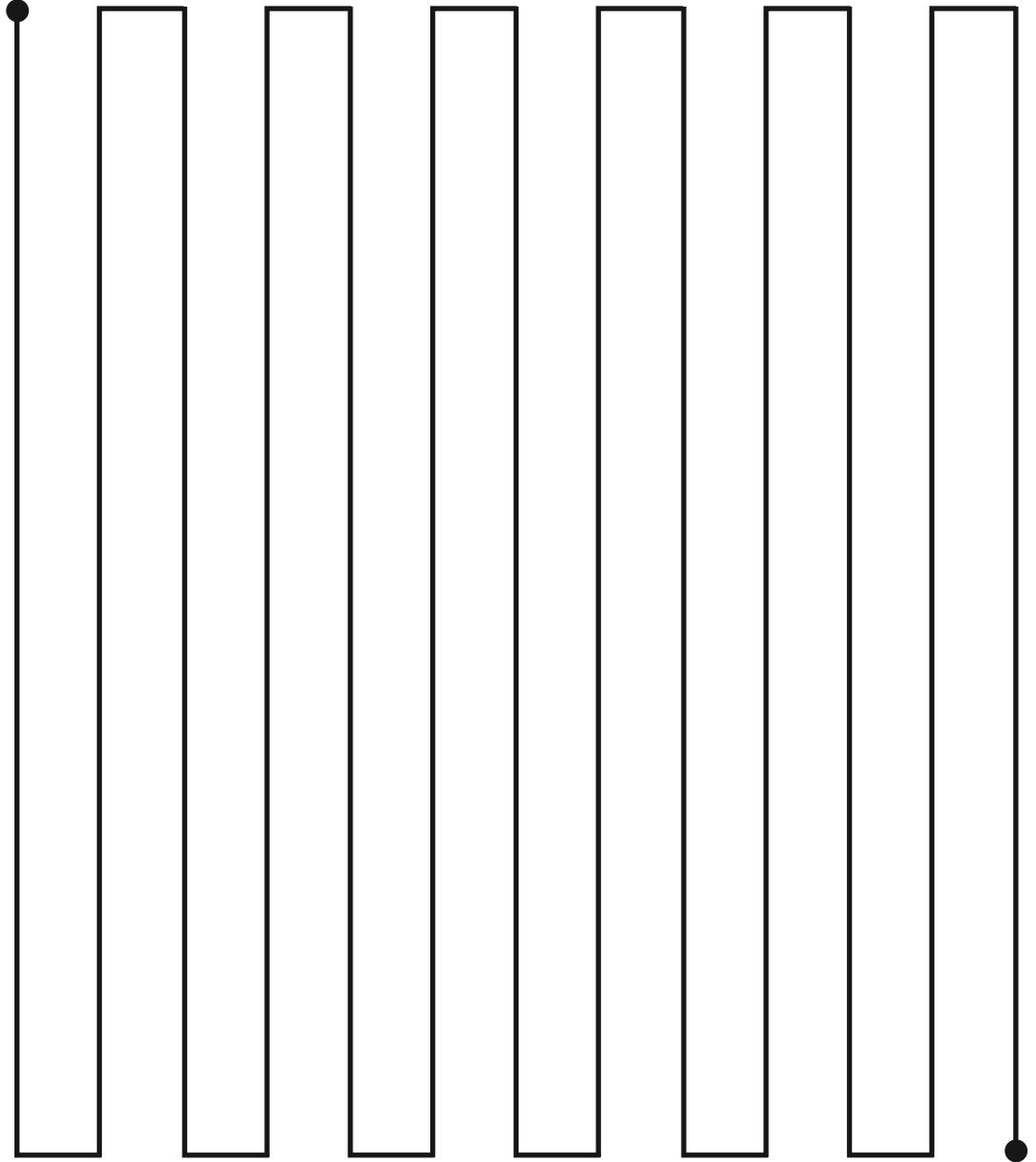
The power switch is located just under the table top on the right side of the table. Please turn your machines on. The presser foot is controlled by the knee lift located next to your right knee. Please locate the knee lift and move your right knee to the right lifting the presser foot. You may raise the presser foot to position your paper for the task. If you prefer, the presser foot can be lifted and lowered by a hand lever located on the back left hand side of the machine. Please locate the hand lever. The hand wheel is located on the right side of the machine. You may use your right hand to pull this wheel toward you to position the needle up or down. To make precise turns you will want to leave the needle down in the paper and raise the presser foot to re position the paper. If you experience a problem with your machine, please stop your timer and tell me. Once the problem is resolved, you may start your timer and continue.

APPENDIX D

Exercise 1-6 experimental sewing worksheet.

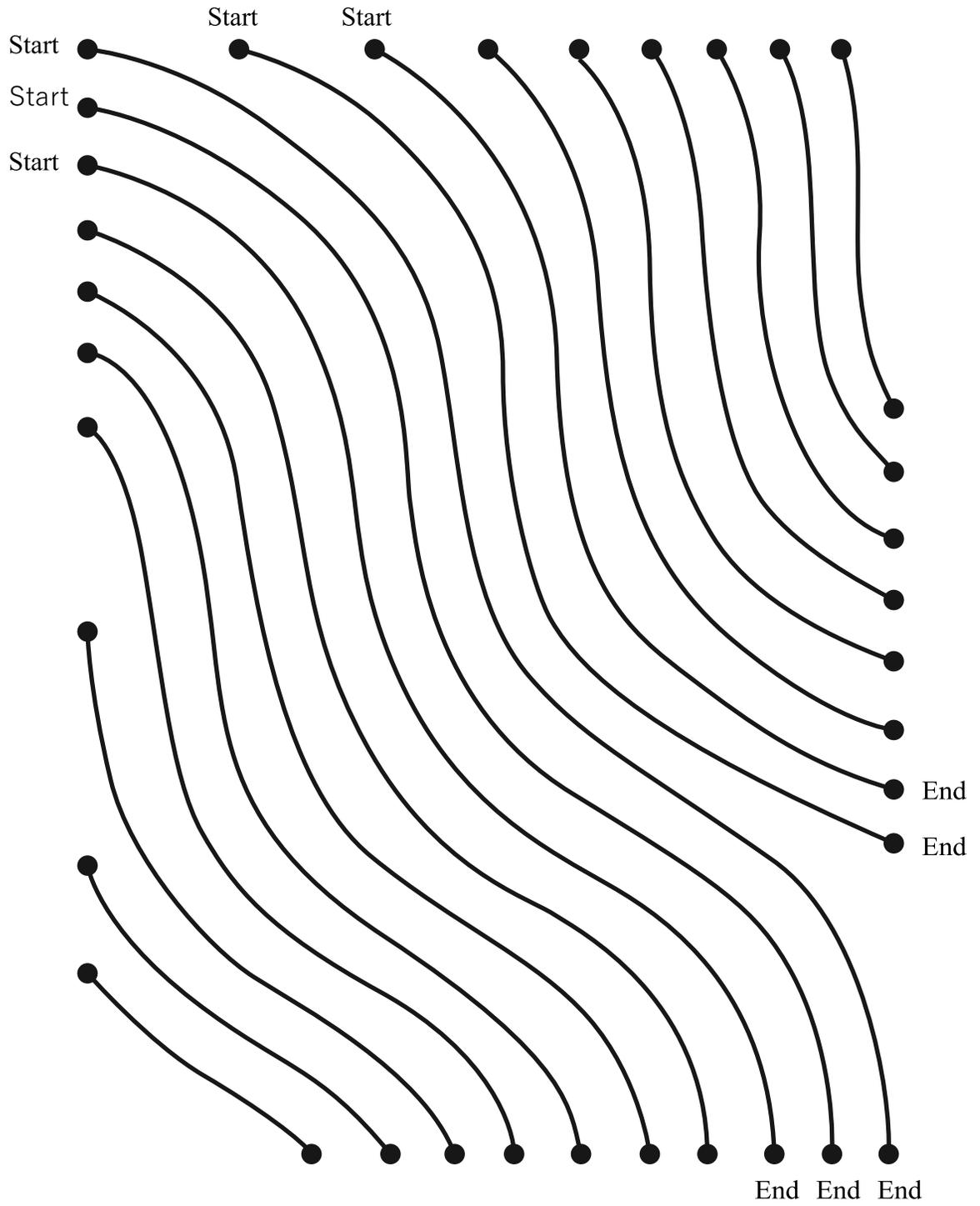
Exercise 1

Start

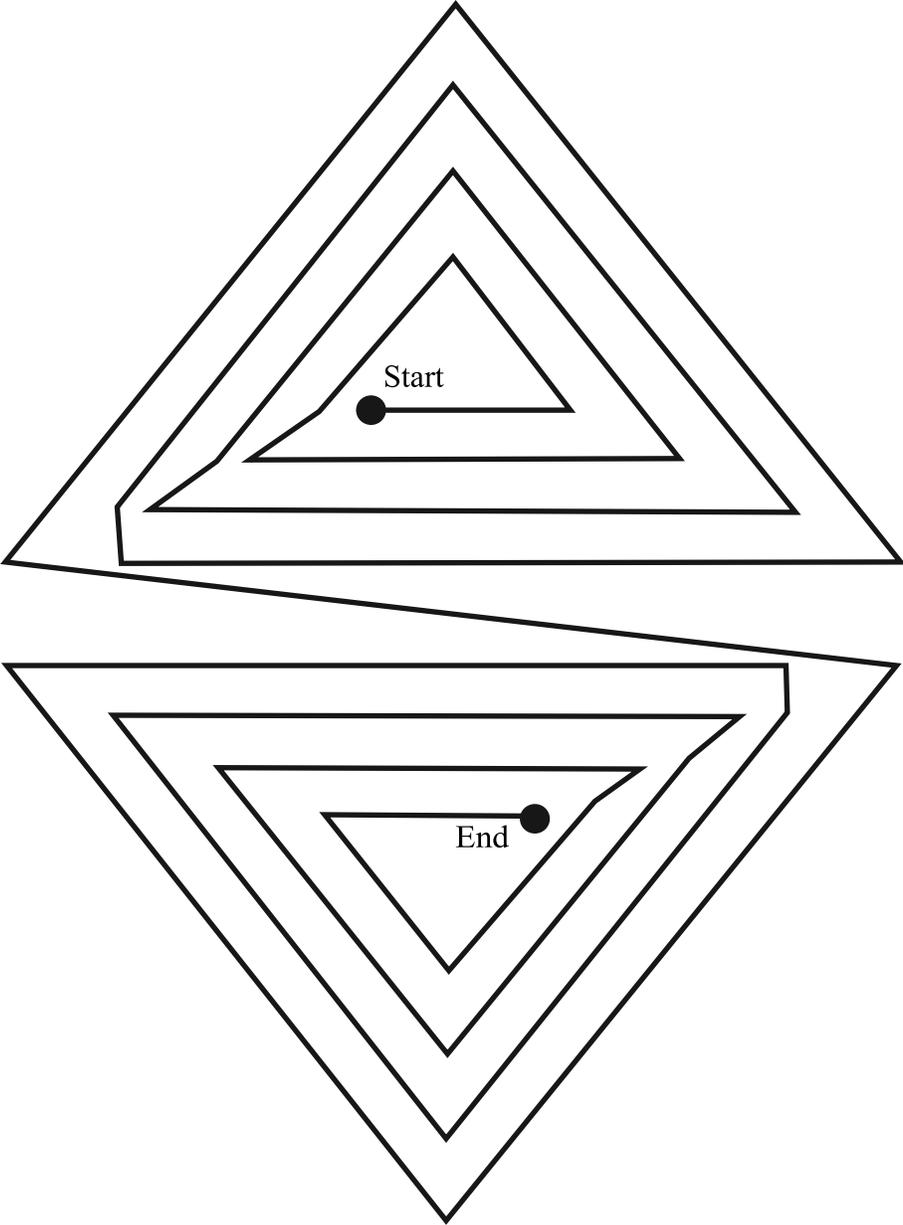


End

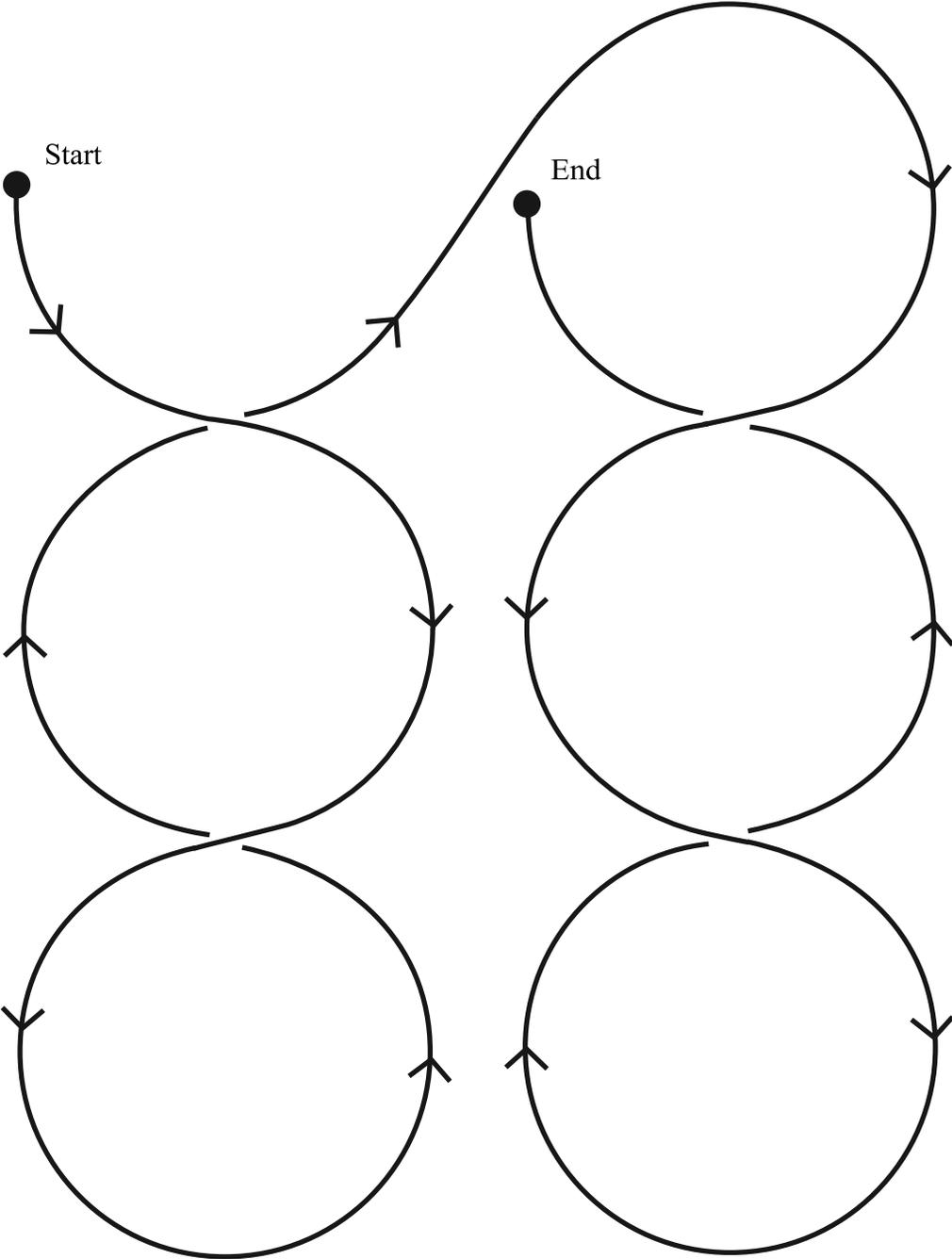
Exercise 2



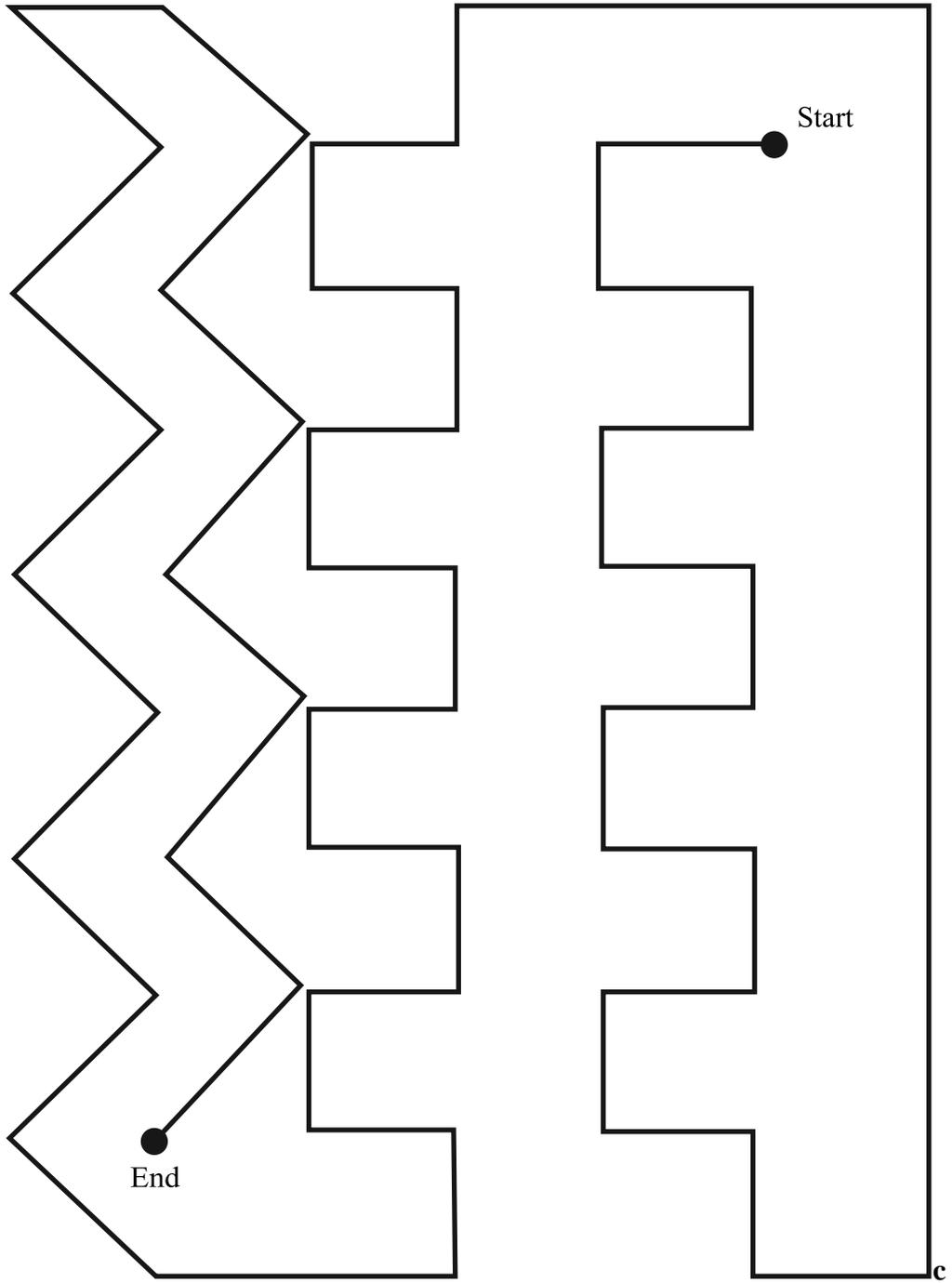
Exercise 3



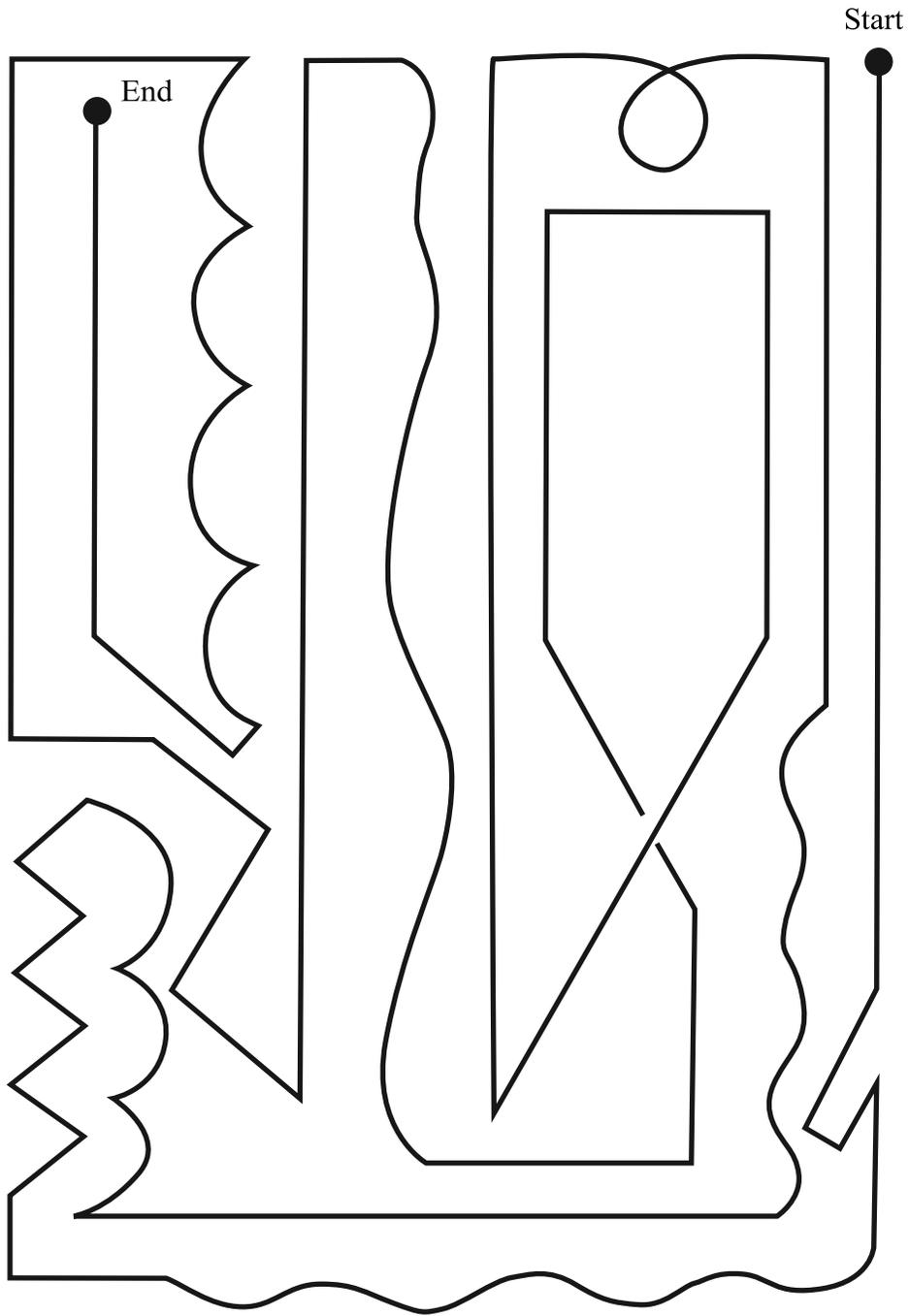
Exercise 4



Exercise 5



Exercise 6



APPENDIX E

Pre-activity survey materials.

Participant number _____

Date _____

Group number _____

Start Time _____

End Time _____

Quality Rank – Excellent (3)

Average (2)

Poor (1)

1. Age _____

2. Gender male female non-binary

3. Major _____

4. Education Year Freshman Sophomore Junior Senior Super senior

5. Sewing experience prior to today _____

Sewing lines on paper with an industrial sewing machine will be fun.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I think sewing lines on paper with an industrial sewing machine will be boring. (R)

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I don't think sewing lines on paper with an industrial sewing machine will not hold my attention at all. (R)

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I think I will describe sewing lines on paper with an industrial sewing machine as very interesting.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I think sewing lines on paper with an industrial sewing machine will be quite enjoyable.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

While I am sewing, I think I will be thinking about how much I enjoy sewing lines on paper with an industrial sewing machine.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

Perceived Choice

I believe I will have some choice to sew line on paper with an industrial sewing machine.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I feel like it will not be my choice to sew lines on paper with an industrial sewing machine. (R)

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I don't think I will really have a choice about sewing lines on paper with an industrial sewing machine. (R)

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I feel like I will have to sew lines on paper with an industrial sewing machine. (R)

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I will sew lines on paper with an industrial sewing machine because I have no choice. (R)

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I will sew lines on paper with an industrial sewing machine because I want to.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

APPENDIX F

Post-activity survey materials.

For each of the following statements, please indicate how true it is for you using the following scale:

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I enjoyed sewing lines on paper with an industrial sewing machine very much.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I think that doing this activity was useful for learning to sewing lines on paper with an industrial sewing machine.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I believe that sewing lines on paper with an industrial sewing machine was of some value to me.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

Sewing lines on paper with an industrial sewing machine did not hold my attention at all.

1	2	3	4	5	6	7
Not at all true			somewhat true			very true

I thought this was important to do because it can improve my knowledge of sewing line on paper with an industrial sewing machine.

How does it make you feel if instructors acknowledge that the assignment may be difficult or boring?

How does it make you feel when instructors say “You have to” or “You must do” with regards to assignments?

Did you feel pressure to stop working in this experiment when other students stopped working?

Did you know anyone who participated in this experiment in your group? If yes, did their finish time pressure you to stay longer or quit sooner?

APPENDIX G

STATA syntax used to conduct analyses

```
***create pre-activity and post-activity interest & enjoyment, value & usefulness, and  
perceived choice scores***
```

```
*reverse score several items
```

```
revrs ie3_1 ie4_1
```

```
revrs ie3_2 ie4_2
```

```
*create scales
```

```
alpha revie3_1 revie4_1 ie1_1 ie2_1 ie5_1 ie6_1 ie7_1, gen(ie1)
```

```
*a = .85 (above the .7 cutoff)
```

```
alpha revie3_2 revie4_2 ie1_2 ie2_2 ie5_2 ie6_2 ie7_2, gen(ie2)
```

```
*a = .94 (above the .7 cutoff)
```

```
***create pre-activity and post-activity value and usefulness scores
```

```
alpha v1_1 v2_1 v3_1 v4_1 v5_1 v6_1 v7_1, gen(vi1)
```

```
*(a = .87) (above the .7 cutoff)
```

```
alpha v1_2 v2_2 v3_2 v4_2 v5_2 v6_2 v7_2, gen(vi2)
```

```
*(a = .95) (above the .7 cutoff)
```

```
*** create pre-activity and post-activity perceived choice scores
```

```
*reverse score several items
```

```
revrs pc2_1 pc3_1 pc4_1 pc5_1
```

```
revrs pc2_2 pc3_2 pc4_2 pc5_2
```

```
*create scales
```

```
alpha pc1_1 revpc2_1 revpc3_1 revpc4_1 revpc5_1 pc6_1 pc7_1, gen(pc1)
```

```
*(a = .81) (above the .7 cutoff)
```

```
alpha pc1_2 revpc2_2 revpc3_2 revpc4_2 revpc5_2 pc6_2 pc7_2, gen(pc2)
```

```
*(a = .89) (above the .7 cutoff)
```

```
***main ttests between groups***
```

```
*examine group differences in PRE-activity questionnaire scores
```

```
ttest ie1, by(group)
```

```
ttest vi1, by(group)
```

```
ttest pc1, by(group)
```

```
* examine group differences in POST-activity questionnaire scores
```

```
ttest ie2, by(group)
```

```
ttest vi2, by(group)
```

```
*create change scores for each group for perceived choice
```

```
gen change=(pc2-pc1)
```

*examine change score differences between groups for perceived choice, since pre-activity scores were significantly different between groups to begin with
ttest change, by(group)

*ttest used to examine group differences in post-activity completion time
ttest time, by(group)

regressions to see if dep vars depend on demographic characteristics above and beyond group membership

*interest/enjoyment post-activity scores
reg ie2 group age gender edu

*value and usefulness post-activity scores
reg vi2 group age gender edu

*perceived choice change scores
reg change group age gender edu

*sewing response time
reg time group age gender edu

*quality on sewing task
reg quality group age gender edu

extra regressions that we added predicting time spent on the sewing task

*TAM classes predicting time
reg time tam2280 tam2380 tam2480

*ten dollar incentive predicting time
reg time tendollars

*create numerical pressure variable
*quickly hand coded 1=no, 2=a little, 3=yes (below)
gen pressure1=pressure
replace pressure1 = "2" in 1
replace pressure1 = "2" in 3
replace pressure1 = "1" in 2
replace pressure1 = "1" in 4
replace pressure1 = "1" in 5
replace pressure1 = "1" in 7
replace pressure1 = "1" in 8
replace pressure1 = "1" in 9
replace pressure1 = "1" in 10
replace pressure1 = "1" in 12

replace pressure1 = "1" in 13
replace pressure1 = "1" in 14
replace pressure1 = "1" in 15
replace pressure1 = "1" in 16
replace pressure1 = "1" in 17
replace pressure1 = "1" in 18
replace pressure1 = "1" in 22
replace pressure1 = "1" in 23
replace pressure1 = "1" in 25
replace pressure1 = "1" in 26
replace pressure1 = "1" in 27
replace pressure1 = "1" in 29
replace pressure1 = "1" in 31
replace pressure1 = "1" in 32
replace pressure1 = "1" in 34
replace pressure1 = "1" in 37
replace pressure1 = "1" in 38
replace pressure1 = "1" in 39
replace pressure1 = "1" in 40
replace pressure1 = "1" in 41
replace pressure1 = "1" in 42
replace pressure1 = "1" in 43
replace pressure1 = "1" in 44
replace pressure1 = "1" in 45
replace pressure1 = "1" in 46
replace pressure1 = "1" in 47
replace pressure1 = "1" in 49
replace pressure1 = "1" in 50
replace pressure1 = "1" in 51
replace pressure1 = "1" in 52
replace pressure1 = "1" in 54
replace pressure1 = "1" in 55
replace pressure1 = "1" in 56
replace pressure1 = "1" in 57
replace pressure1 = "1" in 59
replace pressure1 = "3" in 6
replace pressure1 = "3" in 11
replace pressure1 = "3" in 19
replace pressure1 = "3" in 20
replace pressure1 = "1" in 21
replace pressure1 = "3" in 24
replace pressure1 = "3" in 28
replace pressure1 = "3" in 30
replace pressure1 = "3" in 36
replace pressure1 = "3" in 48
replace pressure1 = "3" in 53

```
replace pressure1 = "3" in 58
destring pressure1, replace
```

```
*social pressure predicting time
reg time pressure1
```

```
***correlations for correlation table***
```

```
*correlations between study vars
```

```
pworth age gender edu tam2280 tam2380 tam2480 tendollars quality ie1 ie2 pc1 pc2 vi1
vi2 time, sig star(.05)
```