

**Fostering Change in Entrepreneurial Intention:  
Experimental Evaluation of an Intervention Based on Career Choice Factors**

by  
Katherine Yourie Kim

A thesis  
presented to the University of Waterloo  
in fulfillment of the  
thesis requirement for the degree of  
Master of Arts  
in  
Psychology

Waterloo, Ontario, Canada, 2016

© Katherine Yourie Kim 2016

## **Author's Declaration**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

---

Katherine Yourie Kim

## **Abstract**

Entrepreneurship is of increasing importance in today's economy and society. As a result, government and policy makers are making a call to encourage venture creation. One of the common ways in which entrepreneurship is encouraged is through interventions that provide people with information about entrepreneurship. Such information, as offered in high school or university courses or programs, is seen as a means to foster entrepreneurial intention—that is, individuals' desire to pursue entrepreneurship as a career. However, among existing studies on the topic, there is a lack of an internally valid evaluation of the impact of such interventions for increasing entrepreneurial intention and a lack of a relevant theoretical basis for any such impact. Accordingly, we provide an evaluation of an entrepreneurship intervention through a lab experiment that draws directly on established theories in career choice. Our findings reveal that exposing participants to information about entrepreneurship can in fact increase entrepreneurial intention. This increase was found to occur mainly through a process of learning about how entrepreneurship can promote one's identity.

## **Acknowledgements**

I would like to thank my supervisor, Dr. John ‘Jay’ Michela, and my readers, Drs. James Beck and Ramona Bobocel, for their support and guidance throughout this process. I am also grateful to my friends and family who have shown incredible patience, understanding, and encouragement throughout this journey.

## Table of Contents

Author's Declaration.....	ii
Abstract.....	iii
Acknowledgements.....	iv
Table of Contents.....	v
List of Figures.....	vi
List of Tables.....	vii
Introduction.....	1
Method.....	10
Results.....	15
Discussion.....	19
References.....	25
Tables.....	33
Figures.....	38
Appendices.....	43

## List of Figures

Figure 1.....	38
Figure 2.....	39
Figure 3.....	40
Figure 4.....	41
Figure 5.....	42

## List of Tables

Table 1.....	33
Table 2.....	34
Table 3.....	35
Table 4.....	36
Table 5.....	37

## **Introduction**

Entrepreneurship is prominent nowadays. We hear about entrepreneurship at every corner, from the popular press, the news, movies (e.g., *Social Network*, *Jobs*), and television shows (e.g., *Shark Tank*). The popularity of venture creation is not only limited to exceptional stories in the media: universities offer programs and courses on entrepreneurship with an increasing number of campuses offering services that support venture creation (N. Singer, 2015) (e.g., the Innovation Lab at Harvard University or the Leslie eLab at New York University). This phenomenon is not limited to North America. Europe advocates for entrepreneurship as well, to the point that the European Union (EU) listed entrepreneurship as one of its eight key competencies for lifelong learning (European Union, 2006). Even developing countries, such as India, are moving from “managerial” to “entrepreneurial” economies and are encouraging young people to consider entrepreneurship as a career (Iyer, 2015).

The worldwide advocacy for entrepreneurship is due to the important role it plays both for the economy and the individual (Baron, 2014). Entrepreneurs boost the economy through business innovation and leadership (Praag & Versloot, 2007). They recognize a problem to be solved or a need to be filled and create a solution through original products and services (Praag, 1999). Their creations in turn create new jobs and businesses, which sparks economic growth. In fact, over the past 40 years, most new jobs in the US came from start-up companies rather than established firms (Thompson, 2014). The Global Entrepreneurship Monitor, a major world-wide project, reports that economies with more entrepreneurship have more economic growth (S. Singer, Amorós, & Moska, 2015).

Entrepreneurship has also been recognized as being important for self-development, as reflected from the EU’s inclusion of entrepreneurship among their key lifelong learning competencies. The competencies that people learn through entrepreneurship are important in all life domains and not just venture creation. Through entrepreneurship, one develops problem-solving and leadership skills and gains experience in dealing with failure.



Recognizing the benefits of entrepreneurship, governments and policy makers are making dedicated efforts to promote venture creation. For instance, over the next three years, the Canadian government aims to invest \$200 million dollars each year towards incubators and accelerators (Liberal Party of Canada, 2015). In 2014, the U.S. Government launched the Spark initiative, uniting programs that aim to promote global entrepreneurship. Each program involved with Spark is committed to generating at least \$10 million dollars over the next three years for emerging entrepreneurs (U.S. Department of State, 2015).

### **Responding to the Call for More Entrepreneurs**

Indeed, it is a part of the field of vocational psychology today to answer calls to promote interest towards a career that would boost economical and societal prosperity (Fouad, 2007). For example, many interventions exist already in the vocational psychology literature on promoting interest towards STEM, another field that is crucial for growing the economy and global competitiveness. More recently, there is an increase in studies examining how to encourage people to pursue entrepreneurship. The outcome used in these studies is entrepreneurial intention, in other words, “what would make someone consider starting their own business?” (Krueger, Norris, Reilly, & Carsrud, 2000) Several flaws inhabit the existing interventions aimed at increasing entrepreneurial intention, which we will address later.

As a first step in developing an intervention on entrepreneurial intention, we first considered: “What is the most fundamental way people make decisions about their career?” The answer is learning new occupational information (Parsons, 1909; Pope, 2015; Porfeli, Lee, & Vondracek, 2013; Savickas, 2010). Indeed, Parsons, the founding father of career counseling and interventions, established “learning information about careers” as an important pillar in vocational choice, specifying that one must “learn occupational information about areas that fit with your attitudes, abilities, interests, values, and personality” (Porfeli et al., 2013, p. 5). Krumboltz, Becker-Haven, & Burnett (1979) argued that knowing information about careers is important in the development of career decision making skills. Holland (1997) has also stressed the fundamentality of this idea to this day. In fact, in current society, providing career

information may be of increasing value due to people's preference to build their own career paths rather than following ones that were decided for them by family members and communities (Grubb, 2002).

### **Studies on the Effect of Information about Entrepreneurship on Entrepreneurial Intention**

There have been several studies on increasing entrepreneurial intention through exposure to information about entrepreneurship. Mainly in the field of entrepreneurship education, the existing studies examined the effect of “any pedagogical [program] or process of education for entrepreneurial attitudes and skills” on one's desire to start a new business (Fayolle, Gailly, & Lassas-Clerc, 2006, p. 702). Most studies were in university contexts (Bae, Qian, Miao, & Fiet, 2014), with some in primary and secondary schools (e.g., Peterman & Kennedy, 2003). Lesson content included identifying business opportunities, creating business plans, and developing management and leadership skills (see also: Sánchez, 2010; Souitaris, Zerbinati, & Al-Laham, 2007). A 2014 meta-analysis of 73 entrepreneurship education studies at the university level (Bae et al., 2014) found a small but significant correlation between entrepreneurship education and entrepreneurial intention ( $\hat{\rho} = .143$ ). Studies from pre-university entrepreneurship programs (e.g., Peterman & Kennedy, 2003; Vilhjalmsdottir, 2007) have also found positive correlations. However, there are two issues from these studies that we bring forward.

**Lack of true experimental design.** As a part of their treatment condition, the existing studies used students already enrolled in entrepreneurship courses and programs. Although they compared this group with students who were not enrolled in entrepreneurship courses and had pre-post measures of entrepreneurial intention, there was no random assignment, thereby making the studies quasi-experiments rather than true experiments. The use of quasi-experiments rather than true experiments is problematic because the ultimate goal of studies on entrepreneurship interventions is to observe whether exposure to information about entrepreneurship impacts entrepreneurial intention. With the participants of the treatment condition being students already enrolled in entrepreneurship courses, one cannot convincingly argue that the new information learned from these courses is what lead to greater entrepreneurial intention. Factors other than

the learning of course content could have influenced the results. For instance, students who enrolled in the entrepreneurship courses may have enrolled because they already have a high intention to become an entrepreneur. In fact, when Bae et al. (2014) controlled for pre-intention in their meta-analysis, the effect of learning about entrepreneurship on entrepreneurial intention disappeared.

**Lack of content effectively impacting career attraction.** The content of the entrepreneurship courses involves learning about the requirements and skills of being an entrepreneur. Recall that a fundamental factor in vocational choice is learning information about occupations that fit with your attitudes, abilities, interests, values, and personality. Although the courses offer occupational information on entrepreneurship, they do not tap into whether students actually perceive a fit between entrepreneurship and their personal characteristics, such as their interests and values. Well-established theories in vocational psychology have identified which personal characteristics—or as we will call them, career choice factors—play a particularly important role in career attraction, which will be discussed shortly. By actually tapping into perception of fit—or congruence—between entrepreneurship and relevant career choice factors, we have the opportunity to evaluate possible mediators between learning about entrepreneurship and entrepreneurial intention, a process that has not been examined before (Bae et al., 2014).

### **The Most Suitable Content for Impacting Entrepreneurial Intention**

We chose the following career choice factors as being the most suitable content for our own intervention on increasing entrepreneurial intention: expected outcomes, vocational interests, and identity. The rationale behind the selection was to include major, broad categories of factors that affect choice and that are also well-established in the vocational psychology literature.

**Expected outcomes.** Any comprehensive scheme to account for choices that people make must include expected outcomes. In fact, one of the most pervasive concepts in the social sciences is rational choice: “it can be said without great controversy that no theoretical approach in this century has ever enjoyed the same level of ubiquity throughout the social sciences as the

rational choice approach has enjoyed today” (Chai, 2001). We see this in Bandura’s prominent Social Cognitive Theory (Bandura, 1986) where a decision to engage in a behaviour depends on the individual’s personal beliefs about the results of that behavior, in other words, his or her outcome expectations. Lent, Brown, & Hackett (1994) extended Bandura’s work to the context of careers in their Social Cognitive Career Theory (SCCT), which is the dominant contemporary reflection of rational choice in vocational psychology. An important cognitive concept behind this theory is outcome expectations, which they define, in line with Bandura’s definition, as “the estimates individuals make of the probability of an outcome” or “If I try doing this, what will happen?” (Lent et al., 2005). SCCT posits that outcome expectations influence career choice, such that people are more likely to pursue an occupation that they believe will provide them with positive outcomes, such as good income and feelings of accomplishment (Fouad & Smith, 1996; Lent et al., 1994; Lopez, Lent, Brown, & Gore, 1997). An intervention study by Diegelman and Subich (2001) supports the important role that outcome expectations play in fostering an intention to pursue a particular career. Among non-psychology undergraduate students, they found that greater outcome expectations of the positive benefits in obtaining a degree in psychology significantly increased intentions to pursue that degree. In the context of entrepreneurship, a study with a large global sample of undergraduate students provides evidence of an association between expected outcomes and entrepreneurial intention (Vanevenhoven & Liguori, 2013).

People will therefore be more drawn to entrepreneurship to the extent that they expect the career to provide positive outcomes. Therefore, in our intervention, participants will not only learn occupational information about entrepreneurship but they will also discuss and think about the positive and desirable outcomes of the career. We therefore expect the intervention to increase their perception of congruence between entrepreneurship and desirable outcomes. In other words, we expect that participants will see a greater overlap or fit between the outcomes they expect from becoming an entrepreneur and outcomes they would desire. As a result, with greater perception of congruence, we expect an increase in entrepreneurial intention.

**Vocational interests.** The motivation to choose a particular career based on expected outcomes, as described earlier, can be reasonably seen as an extrinsically motivated choice, in other words, being motivated by external factors such as money and status. However, as articulated in Ryan and Deci's Self-Determination Theory (Ryan & Deci, 2000), choices can also be intrinsically motivated, in other words, by internal factors such as inherent enjoyment and interest in the activity.

Intrinsic motivation is comparable to Holland's RIASEC theory (Holland, 1959, 1997) which states that people are motivated to choose a career that involves work activities that they find inherently enjoyable and interesting. According to Holland, there are six types of work activities preferences, or vocational interests, that people can have: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. For example, if you have artistic vocational interests, you will be more drawn to a career that involves artistic work activities, like graphic design, than one that does not, like accounting. If we apply this to entrepreneurship, you will be more drawn to entrepreneurship to the extent that you perceive it to involve your own vocational interests. Therefore, through our intervention, we aim to have participants learn about the variety of different work activities that entrepreneurship can involve, including their preferred ones. We therefore expect to change their perception of congruence between entrepreneurship and their vocational interests. In other words, we expect that participants will see a greater overlap or fit between the work activities involved in entrepreneurship and work activities they personally find interesting. As a result, with greater perception of congruence, we expect an increase in entrepreneurial intention.

We recognize that, in the field of vocational psychology, vocational interests are typically viewed as a reflection of one's personality or, more broadly, one's self and identity (Holland, 1997) rather than a reflection of intrinsic motivation. However, there have been arguments in favor for a self-determination view on vocational interests (Blustein & Flum, 1999) where authors argue that the link between vocational interests and career search can be better explained

through motivation theory. We therefore proceeded to distinguish vocational interests from identity and present it as a separate career choice factor, which is discussed next.

**Identity-congruence.** Identity plays an important role in motivated choice. People are generally motivated by a need to sustain their perception of themselves and they do so by gravitating towards environments that confirm these perceptions (Swann, Stein-Seroussi, & Brian, 1992). Identity-based motivation is an integral part of vocational choice as well (Blustein & Noumair, 1996; Erikson, 1968; Raskin & Waterman, 1994; Vondracek, 1992). People are also motivated to choose a career based on whether they perceive congruence between themselves and the environment (Holland, 1997). Indeed, vocational choice is a reflection of how people see themselves (Super, 1980).

In the vocational psychology literature, identity has most commonly been studied through the construct of vocational identity (Holland, 1985; Skorikov & Vondracek, 1998), which is the “possession of a clear and stable picture of one’s goals, interests, and talents” (Holland, 1997, p. 5). Studying identity from that perspective is problematic because it only focuses on the clarity and stability of one’s identity, not the content, nor the congruence between identity and an occupation. The lack of research on identity-congruence and its impact on career choice has been raised, in particular in the entrepreneurship literature. In their call for a greater understanding of the role that identity plays in entrepreneurial intention, Krueger and Norris (2007) point to the bewildering lack of research on the effect of identity-congruence. They argue that whether one can “see” themselves as an entrepreneur is likely to play an important role in the formation of entrepreneurial intentions. There has been some preliminary evidence of this in a cultural study on entrepreneurial intention (de Pillis & Reardon, 2007). Both in the US and in Ireland, participants who believed that being an entrepreneur is consistent with “who they are” reported greater entrepreneurial intention, independent of their other beliefs about entrepreneurship.

We therefore include identity-congruence as the third career choice factor for the content of our intervention. We use a definition of identity that is more content-focused than clarity-focused, in other words, we define identity as the values and life goals that are important to the

individual (Porfeli et al., 2013). In line with Holland's theory of person-environment fit, we expect that the more a career—in our case entrepreneurship—is perceived as being congruent with one's values and life goals, the greater the intention to pursue that career. For example, if you value social justice but you perceive entrepreneurship as being representative of profit and money, you likely will be less drawn to become an entrepreneur. However, if you learn that entrepreneurship could in fact involve the promotion of social justice, like starting a business that helps people from poor neighbourhoods find jobs, then you will likely feel more drawn to it. Therefore, through our intervention, we aim to have participants discover how entrepreneurship can involve their own values and life goals and potentially shift their perception of congruence between themselves and entrepreneurship. From there, we expect to observe a change in entrepreneurial intention.

## **Hypotheses**

Putting everything together, we hypothesize that:

*Hypothesis 1:* Participants in our intervention will show a greater increase from pre- to post-entrepreneurial intention compared with those in the control group.

*Hypothesis 2:* The increase in entrepreneurial intention will be mediated by an increased perception of congruence between entrepreneurship and one's:

(2a) vocational interests,

(2b) expected outcomes, and

(2c) identity.

*Hypothesis 3:* The increased perception of congruence will be mediated by having *learned* from our intervention that entrepreneurship can involve one's vocational interests, expected outcomes, and identity.

## **Overview of the Procedure**

In summary, we are conducting a lab experiment where the content of the intervention is based on established vocational psychology theories associated with career choice. We will have pre- and post-measurements as a way to track changes in entrepreneurial intention and

changes in perception of congruence between entrepreneurship and one's vocational interests, expected outcomes, and identity. We pre-selected students who scored in the lower 75% of the entrepreneurial intention measure in order to be able to observe an increase in entrepreneurial intention in the post-measures. We chose 75% because that cut-off point takes into account individuals from the low to moderately-high level of entrepreneurial intention.

The independent variable is condition (control vs. treatment). The mediators are perception of congruence between entrepreneurship and each of the three career choice factors. In other words, participants' perception of the extent to which the work activities, outcomes, and values and life goals associated with entrepreneurship overlap or fit with their own vocational interests, desired outcomes, and values and life goals. The outcome variable is entrepreneurial intention.

Entrepreneurship makes a good context for studying change in intention to pursue a career. With entrepreneurship, it is likely that people are not clear on what work activities are involved in entrepreneurship given that it is not a traditional career, such as becoming a doctor. Most of us have been exposed to traditional careers through our regular life routines. For instance, many of us have been to the doctor or the mechanic but we cannot say that many have "been to the entrepreneur". The unfamiliarity of entrepreneurship as a career is likely so people's perceptions of entrepreneurship are likely to be more malleable.

Overall, it is important to remember that we are not aiming to change the person. Other studies on career interventions have done so where the goal was to change people's vocational interests (Turner & Lapan, 2005) or self-efficacy (Betz & Schifano, 2000). We are instead focusing on changing people's perception of the congruence between themselves and entrepreneurship.



## Method

### Participants

Participants were 129 undergraduate students enrolled in a psychology course at a large Canadian university where they were offered a credit toward a psychology course in compensation for participating in our study. The sample, with a mean age of 19.75 ( $SD = 2.12$ ) and comprising of mostly women (75.8%), consisted of two groups: a treatment group ( $n = 62$ ) and a control group ( $n = 67$ ). Throughout the study sessions, some participants left certain measures and measure items blank, so there are variations in the sample size for different analyses.

### Design

Our study is a pre-test–post-test lab experiment with two conditions: treatment and control. Study sessions were each randomly assigned to either the control or treatment condition. The treatment condition involved a group discussion with other participants about entrepreneurship and the control condition involved a group discussion about an unrelated topic: being a student at the University of Waterloo. Discussions were facilitated by either a graduate student or a research assistant involved in the study. Study sessions were each randomly assigned to either the graduate student or the research assistant as the facilitator.

### Procedure

**Before the discussion session.** Participants completed pre-test measures which consisted of measures for entrepreneurial intention and congruence between entrepreneurship and each of the three career choice factors: vocational interests, expected outcomes, and identity-congruence (measures further described below). These measures were completed online at the beginning of term. As previously mentioned, we then pre-selected individuals based on their entrepreneurial intention score. Those who signed up for our study came to the lab and completed our consent form (Appendix G) and a measure of their RIASEC vocational interests. After completing the latter, participants engaged in a 30-40 minute group discussion. The number of participants in each session varied depending on the number of sign-ups, so the range was 1 to 5 students.

**During the discussion session.** The participants in the treatment condition discussed entrepreneurship in relation to the three career choice factors. The facilitator first gave occupational information about entrepreneurship by explaining the different stages involved in creating a venture. A poster explaining different stages of entrepreneurship was placed at the front of the room (Appendix H). For each of the stages, the facilitator gave a brief definition and asked pre-scripted discussion questions. After presenting and discussing all five stages, the facilitator proceeded to introduce activities that were meant to increase people's perception of congruence between entrepreneurship and each of the three career choice factors.

Starting with vocational interests, the facilitator gave a brief description of each RIASEC interest type and asked: "Raise your hand if you think you have this interest type" and "Which stages of entrepreneurship do you think might involve this interest type?"

Next came the exercise about expect outcomes, where participants were given a handout (Appendix I) and asked to write down tangible and intangible benefits of being an entrepreneur. Tangible benefits consisted of material or tangible advantages of a career in entrepreneurship, such as money. Intangible benefits consisted of non-material advantages, such as having a feeling of autonomy. Participants were informed that after a few minutes of writing down their answers, they would each share with the group one of their answers, which the facilitator would then write on a flipchart.

Finally, to increase identity congruence, there were two exercises which we developed. The first exercise involved participants placing a photo of themselves in the centre of a sheet that had images representative of entrepreneurship (Appendix J). The photo they used was either a picture that they took of themselves with their mobile phones or a face template they coloured if they did not have a picture-taking phone. The purpose of having participants place an image of themselves at the center of the sheet was to encourage them to picture themselves in the context of entrepreneurship and to put them in the mindset of being an entrepreneur. Participants then completed the second exercise where they filled out a handout asking how, as an entrepreneur,

their personal values and life goals might be achieved (Appendix K). Each participant then shared at least one of their answers with the group that the facilitator wrote on the flipchart.

The discussion framework for the control condition is similar to the one for the treatment condition except that participants in the control condition discussed being a University of Waterloo student. Therefore, the session started with a discussion of the five of the pillars in the University's strategic plan instead of the five stages of entrepreneurship (Appendix L). Note that one of the pillars described in the poster is entrepreneurship, which allowed us to control for the possibility that merely discussing entrepreneurship would have led to a change in entrepreneurial intention. Then, instead of talking about the benefits of entrepreneurship, participants discussed aspects of student life they enjoy and which aspects could be improved (Appendix M). And finally, instead of placing their photo on a sheet with images of entrepreneurship, they placed their photo on a sheet with images representative of student life at the university (Appendix N). They then wrote down and discussed how, as a University of Waterloo student, they might promote their personal values or life goals (Appendix O).

**After the discussion session.** Participants completed a set of post-test measures consisting of the same measures as the pre-test. However, there was an additional measure on the extent to which participants felt they learned new things about entrepreneurship in relation to the three career choice factors (further described below). They were then debriefed about the study (Appendix P).

## Measures

**Entrepreneurial intention.** To assess entrepreneurial intent, we used Liñán and Chen's (2009) Entrepreneurial Intention scale (Appendix A). This 6-item scale (Treatment  $\alpha_{pre} = .96$ ,  $\alpha_{post} = .94$ ; Control  $\alpha_{pre} = .94$ ,  $\alpha_{post} = .95$ ) measures intention of becoming an entrepreneur through ratings of level of agreement with items that include: "My professional goal is to become an entrepreneur" and "I will make every effort to start and run my own firm". Participants rated their level of agreement on a 7-point Likert scale, from 1 (*total disagreement*)

to 7 (*total agreement*). Scoring of entrepreneurial intent was calculated by averaging the ratings to the six items.

**Involvement of vocational interests.** To measure the extent to which participants perceive entrepreneurship to involve their own vocational interests, we developed a 5-item scale (Treatment  $\alpha_{pre} = .95$ ,  $\alpha_{post} = .95$ ; Control  $\alpha_{pre} = .90$ ,  $\alpha_{post} = .91$ ). We developed a measure because no such measure existed in the literature. As shown in Appendix B, participants provided ratings on a 9-point Likert scale, from 1 (*not at all*) to 9 (*completely*). The lead-in to the items was: “If you were to pursue entrepreneurship as a career, to what extent do you imagine that you would...” Items included: “...be pursuing your own work activity preferences” and “...be doing enjoyable work”. Scoring were calculated by averaging the answers for all 5 items.

**Expected outcomes.** We developed a 12-item scale (Treatment  $\alpha_{pre} = .80$ ,  $\alpha_{post} = .84$ ; Control  $\alpha_{pre} = .77$ ,  $\alpha_{post} = .77$ ) which measures the extent to which participants expect that various specified outcomes would accrue to them as a result of taking on entrepreneurship as a career (Appendix C). We developed a measure because no such measures existed in the literature. Participants rated outcomes on a 7-point Likert scale, from 1 (*totally disagree*) to 7 (*totally agree*) on items such as: “I would have a satisfactory income” and “I would experience a feeling of personal accomplishment”. Scoring was calculated by averaging the answers for all 12 items. The items were derived from entrepreneurship and vocational psychology literature (Carter, Gartner, Shaver, & Gatewood, 2003).

**Identity-congruence.** To measure identity-congruence, we modified a social psychological measure of Inclusion of Other in the Self (IOS; Aron, Aron, & Smollan, 1992). Our measure assesses the extent of overlap that participants perceive between their self and, in our modification, entrepreneurs. As shown in Appendix D, participants are asked to “circle the picture that best describes the extent to which you see your personal characteristics, life goals, values, and aspirations as being the same as those of an entrepreneur.” Based on participants' selection of one of the 7 images shown, responses were coded on a scale ranging from no overlap (1) to extreme overlap (7). We chose to adapt this particular measure for identity-congruence

because we found it best captures the extent to which participants can “see” themselves as an entrepreneur.

**Learning about entrepreneurship and career choice factors.** A further measure (Appendix E) was developed to assess participants' perceptions of whether, through the group interaction in the study's procedure, participants learned about how entrepreneurship can involve their interests, expected outcomes, and life goals and values. There were 5 items for each of the three motivation sources, each rated on a 7-point Likert scale. Items included “provide psychological benefits that are important to me such as sense of fulfilment;” “provide opportunities for pleasurable work;” and “fit my personal values or life goals.” A factor analysis of all 15 items provided little support for differentiating the three corresponding subscales, so all 15 items were averaged to produce a global score ( $\alpha_{Treatment} = .94$ ,  $\alpha_{Control} = .98$ ).

**Vocational interests.** We also measured participants' specific vocational interests using the Vocational Preference Inventory (Armstrong, Allison, & Rounds, 2008). This measure was used for further analyses after testing the main hypotheses; it is not a measure of one of the mediators in Hypothesis 2. As shown in Appendix F, this 48-item scale ( $\alpha_{Treatment} = .90$ ,  $\alpha_{Control} = .88$ ) measures participants' vocational preferences in terms of Hollands' (1997) dimensions: Realistic, Investigative, Artistic, Social, Enterprising, Conventional. Rating scales range from 1 (strongly dislike) to 5 (strongly like) for items including “Negotiate contracts for professional athletes” and “Compose and arrange music.”

## Results

### Effect of Intervention on Entrepreneurial Intention

We first tested whether there was a post-treatment difference in entrepreneurial intention. Results of a t-test shows that treatment condition had higher intention scores after the intervention compared to the control condition (Control:  $M = 2.27$ ,  $SD = 1.21$ ; Treatment:  $M = 2.82$ ,  $SD = 1.27$ ;  $t(126) = -2.50$ ,  $p = .01$ ) (Figure 1). There was no significant difference in pre-intention scores between conditions (Control:  $M = 2.36$ ,  $SD = 1.19$ ; Treatment:  $M = 2.53$ ,  $SD = 1.36$ ;  $t(127) = -.74$ ,  $p = .46$ ), providing evidence that random assignment was successful.

To test whether there was a greater *change* in intention in the treatment group than in the control, we used residualized difference scores for intention<sup>1</sup> because it takes into account the correlation between pre- and post-intention scores when calculating the difference between the two scores. The residualized difference score is written as “ $\Delta$  Intent” from here on. We performed a regression of the residualized change in entrepreneurial intention, i.e.  $\Delta$  Intent, on condition. We found that there was a greater change in intent in the treatment condition than the control ( $b = .47$ ,  $SE = .18$ ,  $\beta = .22$ ,  $p = .011$ ).

### Mediation of Treatment Effect

As with the previous analysis, we used a residualized difference score for each career choice factor, represented as “ $\Delta$  Interest”, “ $\Delta$  Outcomes”, and “ $\Delta$  Identity”, respectively. Table 1 first shows correlations between condition, change in career choice factors, and change in intention.

Figure 2 represents the path model that guided our mediation analysis. As mediators, we have the three career choice factors in parallel. To test this path model, we first regressed each mediator on condition to obtain the corresponding effect. We then regressed change in intention

---

<sup>1</sup> We used difference scores because we wanted to develop the simplest possible path models and use relatively straightforward bootstrapping tests of mediation. We therefore aimed to control for pre-treatment levels of the outcome, as well as mediators, and the usual way to do this is with inclusion of covariates. We accomplished covariate adjustment by calculating residualized gain scores. Morris & DeShon (2002) confirmed that “both approaches [mean difference between covariance-adjusted means or residualized gain scores] provide the same estimate of the treatment effect” (p. 114).

on all three mediators and condition to obtain the effect of each mediator on change in intention and the direct effect ( $c'$ ) of condition on change in intention. The total effect ( $c$ ) was calculated earlier in the analysis for the first hypothesis.

Mediation was assessed as the indirect effect of condition on change in intention through each mediator using bootstrapped tests, as recommended by Preacher and Hayes (2014). The bootstrap tests compute a confidence interval around the indirect effect. Mediation is said to be present if zero falls outside the confidence interval. We used the SPSS process macros recommended by Preacher and Hayes (2014). Results in Table 2 show a significant indirect effect through identity since the confidence interval does not include zero.

For exploratory purposes, we also analyzed each motivation source separately as individual mediators. In other words, we tested the effect of condition on change in intention through change in perception of interest involvement, and then the effect of condition on change in intention through change in perception of outcomes involvement, and finally the effect of condition on change in intention through change in perception of identity involvement. We found that in addition to identity, outcomes also significantly mediated the effect of condition on change in intention ( $a*b = .09$ , 95% CI [.01, .27]). This provides a hint that outcomes may play a role but one that is closely tied to identity.

### **Effect of Learning about Entrepreneurship on Change in Intention**

To address our third hypothesis, we tested whether the increased perception of congruence is indeed mediated by having *learned* from our intervention that entrepreneurship can involve one's vocational interests, expected outcomes, and identity. Given that identity was the only mediator that was significant in the results for the second hypothesis, we only include identity in our next path analyses. As a result, we tested the serial mediation model in Figure 3, where the exogenous variable is condition, the first mediator is learning, the second mediator is change in perception of identity involvement, and the final outcome is change in intention. This indirect path was significant ( $coefficient = .25$ ,  $SE = .07$ , 95% CI [.14, .41]), so it is indeed the learning of new information from our intervention that led to the subsequent stream of effects.

## What about Vocational Interests?

It is odd that perception of vocational interest involvement was not a significant mediator given the well-established importance of vocational interests in career choice. We therefore looked at vocational interests from a different angle, in other words, as an individual difference.

Among the six RIASEC interest types, there is evidence that entrepreneurship is associated with enterprising interests (Almeida, Ahmetoglu, & Chamorro-Premuzic, 2014; Scanlan, 1980; Schmitt-Rodermund, 2004). It is therefore feasible to wonder whether our intervention had a stronger impact among those with greater enterprising interests. Indeed, there is reason to believe that people differ in their receptivity to messages as a function of individual differences that are related to the content of the message (de Pillis & Reardon, 2007; Gati, 2013; Haddock, Maio, Arnold, & Huskinson, 2008; Zanna, 1993). We therefore think that people with higher enterprising interests are likely to be more receptive to learning about entrepreneurship than those with lower enterprising interests.

To get an idea of where enterprising might act as a moderator in the path model shown in Figure 3, we first did a rough split of the enterprising scores ( $M = 2.67$ ,  $SD = .75$ ) into three groups. We had a “low enterprising” group which consisted of the scores in the lower 33<sup>rd</sup> percentile; the “average enterprising” group, which consisted of the scores in the 34<sup>th</sup>-66<sup>th</sup> percentile; and the “high enterprising” group, which consisted of the scores in the top 33<sup>rd</sup> percentile. We then calculated correlations between Condition & Learning, Learning &  $\Delta$  Identity, and  $\Delta$  Identity &  $\Delta$  Intent at each level of enterprising interests (see Table 4). This allowed us to get a bird’s eye view of how the correlations change as the level of enterprising interests increase. We see from Table 4 that the correlation between Condition & Learning moderately increases as enterprising interests increase. The correlation between Learning &  $\Delta$  Identity, on the other hand, makes a large leap as enterprising interests increase, going from .07, to .44, to .66. We see there is a particularly large increase between the low and average enterprising interest levels and a decently large increase between average and high enterprising interest levels. Finally, the correlation between  $\Delta$  Identity &  $\Delta$  Intent seem relatively constant. It



therefore appears that everyone is receptive to learning about entrepreneurship, but those with little enterprising interests are less impacted by the effects of learning. In other words, it appears that the enterprising interest variable is moderating the path between Learning and  $\Delta$  Identity.

The corresponding moderated mediation model that we tested is found in Figure 4. The interaction term for Learning and Enterprising in predicting  $\Delta$  Identity, while controlling for Condition, was significant ( $b = .28$ ,  $SE = .08$ ,  $p < .01$ ;  $\Delta R^2 = .07$ ,  $p < .01$ ). The interaction is presented in Figure 5. Tests of simple slopes at high (+1SD), average (mean), and low (-1SD) levels of enterprising interests showed evidence that the relation between Learning and  $\Delta$  Identity is stronger when enterprising interests are average ( $t = 4.47$ ,  $p < .001$ ) and high ( $t = 4.97$ ,  $p < .001$ ) than when enterprising interests are low ( $t = 1.00$ ,  $p = .32$ ). Bootstrapped tests of moderated mediation as recommended by Preacher and Hayes (2014) further supported these findings. The computed confidence interval around the indirect effect of Learning on  $\Delta$  Intent through  $\Delta$  Identity, while controlling for condition, did not include zero at high (+1SD) and average levels of enterprising interests (see Table 5).

## Discussion

Because of our true experiment research design and given our findings, we can say that our intervention caused an increase in entrepreneurial intention, a conclusion that previous studies on the topic could not claim due to the limitations of their study designs. In addition, because the topic of the intervention was directly related to factors that are known to influence career choice, we were able to trace the process through which the intervention caused an increase in entrepreneurial intention.

### **You Must be Receptive Before Feeling Drawn Towards Entrepreneurship**

Putting our results together, it appears that first and foremost, you must have a predisposition to finding enterprising activities enjoyable in order for the message of the intervention to most effectively reach and inspire you. Although people of any level of enterprising interests appeared to be receptive to learning about entrepreneurship, it appears that for participants with little enterprising interests, the effects of that learning are lessened. It could be that those who are not interested in enterprising activities, such as negotiating and selling, are more decided that entrepreneurship is not for them and, as a result, are less open-minded to integrate their values and life goals into that career. This resistance to entrepreneurship is evident from some of the answers in the written portion of the identity exercise. For example, one participant with lower enterprising interests ( $z_{enterprising} = -1.59$ ) reflects that resistance in his or her answer: "... I feel my personal values/life goals (stable job/income, time for hobbies/family, type of job) will not be attained by becoming an entrepreneur."

### **Learning about the Involvement of Your Identity is What Draws You**

Once receptive to the idea of becoming an entrepreneur, what appears to have led people to feel more drawn to entrepreneurship was the fact that they learned from our intervention how entrepreneurship can involve their values and life goals. Indeed, they perceived a greater overlap between themselves and entrepreneurs after participating in our study.

**Further evidence from participant responses.** It is fair to assume that the portion of the intervention that discussed values and life goals was involved in this effect because participants

actually had to take the time to consider and write down how entrepreneurship could involve their values and life goals. In fact, there is anecdotal evidence for this. For example: “If I was to do something related to [entrepreneurship], I would focus my energy on building a business that would benefit the community. Like a ‘social service’ aimed business. This would help push my values regarding building community & bringing people together to help them achieve their own personal goals & succeed in life.” Another student wrote: “Through entrepreneurship, I would be able to satisfy my goals of helping people by owning my own physiotherapy clinic. This would allow me to help people recover from injuries, remove/reduce their pain and help them have pain-free ADL and improved their performance in sport or work.” Therefore, taking the time to think about connections between themselves and entrepreneurship may have led them to perceive greater overlap between themselves and entrepreneurs, thereby pushing them to feel more drawn towards entrepreneurship.

**Millennials’ approach to career choice.** The fact that identity was, overall, the mediator with the strongest impact makes sense given that Millennials, of which our sample is composed, are looking for jobs that fit with who they are. For instance, a respondent in the Pricewaterhouse Coopers’ 2008 Millennial Survey stated that “My career will be one of choice, not one chosen out of desperation. I will align who I am with what I do.” Finding alignment—or congruence—with “who I am” is important so it is possible that thinking about how their identity can fit into entrepreneurship struck a particularly strong chord with them, thereby paving the way for them to see entrepreneurship as a possible career path.

### **The Possible Issues with Expected Outcomes**

Although people in the treatment condition did report more beneficial outcomes in entrepreneurship, that change in perception did not in turn impact entrepreneurial intention. Possible reasons why are discussed.

**Measure did not assess desire for outcomes.** It is possible that because our measure of outcomes did not tap into whether participants actually desired the outcomes listed in the measure, the effect of outcomes on intention did not make it to the end of the mediation path. For

instance, I may have learned more about the possible benefits of entrepreneurship, but many of these are not the benefits that I am looking for personally, so I still do not feel a greater intention to pursue entrepreneurship based on those outcomes.

**People may conceptualize outcomes and identity as highly overlapping.** When analyzing each career choice factor as separate mediators, expected outcomes came out as a significant mediator, but its mediating effect disappeared once the other two career choice factors were included in the model. This may be due to how people conceptualize outcomes and identity: they may see them as being highly overlapping. In fact, the significant correlation between outcomes and identity suggests this ( $r = .37, p < .01$ ). Given that identity is the strongest mediator, and therefore likely to be the most immediate precursor to intention, outcomes could be affecting intention through identity. This idea seems feasible from looking at some of the answers that participants wrote during the identity activity. Several participants wrote about how entrepreneurship can give them outcomes that they desire, such as “flexible hours” and “making good money”. Thus, desirable outcomes could be a part of their identity, such that seeing a greater involvement of their desired outcomes leads to feel a greater attraction towards entrepreneurship through their identity.

### **Limitations**

**No behavioural outcome.** In our findings, we did not mention a behavioral outcome however we did measure one. We tracked whether participants visited an online resource that had information about entrepreneurship after participating in our study. Unfortunately, we did not see an effect of condition on number participants who visited the site at least once.

**Operationalization of outcomes and interests.** Although there were weak mediations for expected outcomes and interests, this does not mean that those factors do not mediate. It is possible that our operationalization for those variables, both in the discussion session and in the measures, did not effectively capture those constructs. For outcomes, in both the discussion session and in the measures, we did not ask about whether participants personally wanted the outcomes discussed or the outcomes listed in the measure. For instance, some participants said

that although they personally do not care about, say, getting prestige, it is still a possible outcome of entrepreneurship and one that others may desire. The activity therefore may have led to an *objective* listing and rating of possible outcomes, rather than a personally relevant one, thereby making it less inviting to think about how entrepreneurship can be congruent with one's self.

For interests, participants may have thought that all of the RIASEC vocational interests are required in entrepreneurship given that they talked about each one during the discussion. As a result, participants may have felt deterred from answering in strong agreement with items like "I would be doing enjoyable work." They may have thought: "I would also have to do other types of work that I'm not crazy about, so I can't strongly agree that I would do enjoyable work". This ties into the other possible issue with the interest variable where its operationalization in the discussion session did not line up with its operationalization in the measure. In the discussion session, participants talk about specific work activity preference types, however the measures only talk about work activity preferences overall without touching upon specific ones. We therefore may have lost the effect of interest from the lack of a clear and consistent connection between the two operationalizations. This is contrary to our operationalization of outcomes and identity where, for both the discussion and the measures, we consistently refer to them as outcomes/benefits and values/lifegoals, respectively.

**Level of engagement required in the discussion activities.** Another limitation is that the level of engagement required for the interests, outcomes, and identity activities was not consistent. For interests, the activity only involved verbal responses; for outcomes, participants were given time to reflect and write down their thoughts that were then discussed as a group, some of which were jotted down on a flipchart by the facilitator; and for identity, the activity had two parts: an eye-catching visual component (the selfie exercise), a writing and reflection component, and a discussion and flipchart component. Also, the order of the career choice factors discussed was kept consistent. We therefore may have lost the effect of interest also due to it consistently being the first topic discussed and it being a relatively less engaging activity.

And we may have had a particularly strong impact from identity because it was always discussed last and it was the most engaging activity in the intervention.

### **Theoretical and Practical Implications**

**Shaking up the system.** Through our intervention, we were able to observe how well-established theories in vocational psychology act as mediators—or as the process—through which people feel more drawn to a career. With our lab experiment design, we had the opportunity to “shake up the system”. In other words, we had the opportunity to create change in a set of factors that represent a system of well-established theories in career choice and observe how that change impacts career attraction. It appears in the end that, in line with what vocational psychologists have been saying, identity is particularly striking.

**Targeting the right people.** Career services can assist their clients with their search of potentially suitable careers by helping them become aware of how a particular vocation can align with important aspects of their identity. In terms to entrepreneurship, our results suggest that these efforts would be particularly well-suited for individuals with enterprising interests since they would be more receptive to the idea that their values and life goals could be satisfied as an entrepreneur. Our study therefore provides preliminary insight into how career counsellors can most effectively guide the most suitable people towards a particular career.

### **Future Directions**

It would be fruitful to continue trying to test the intention-behavior link in order to establish whether intentions could materialize into an action, like career search, joining clubs, or signing up for courses on entrepreneurship. Targeting a different age group, namely teenagers, would also be important because those are the years when career aspirations start to form. The intervention may therefore be particularly impactful for them during that time (Obschonka, Silbereisen, & Schmitt-Rodermund, 2010; Schmitt-Rodermund, 2004).

### **Conclusion**

For decades, vocational psychology has sketched a picture of development of career attraction, in which, bit by bit, children and young people receive information about careers and

evaluate that information in relation to career factors. They are asking: “Is this career in line with who I am? Will I get to do what I enjoy? Will it give me what I want out of my career?” People become more or less attracted to an occupation on that basis.

Through this experiment we were able to take a snapshot of that picture in the context of entrepreneurship, a field that is important in today’s economy. From this snapshot, we were able to observe, piece by piece, the dynamic interplay between important theories in career decision making and the roles and the positions they take in impacting entrepreneurial intention. More specifically, the importance of a career being perceived as satisfying important aspects of your identity and the fundamental role of learning occupational information, particularly when the right vocational interests are in play.

## References

- Almeida, P. I. L., Ahmetoglu, G., & Chamorro-Premuzic, T. (2014). Who Wants to Be an Entrepreneur? The Relationship Between Vocational Interests and Individual Differences in Entrepreneurship. *Journal of Career Assessment, 22*(1), 102–112.  
<http://doi.org/10.1177/1069072713492923>
- Armstrong, P. I., Allison, W., & Rounds, J. (2008). Development and initial validation of brief public domain RIASEC marker scales. *Journal of Vocational Behavior, 73*(2), 287–299.  
<http://doi.org/10.1016/j.jvb.2008.06.003>
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of Other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology, 63*(4), 596–612. <http://doi.org/10.1037/0022-3514.63.4.596>
- Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. (2014). The Relationship Between Entrepreneurship Education and Entrepreneurial Intentions: A Meta-Analytic Review. *Entrepreneurship Theory and Practice, 38*(2), 217–254. <http://doi.org/10.1111/etap.12095>
- Bandura, A. (1986). *Social foundations of thought and action: a social cognitive theory*. Englewood Cliffs, N.J.: Prentice-Hall.
- Baron, R. A. (2014). *Essentials of Entrepreneurship: Evidence and Practice*. Northampton, MA: Edward Elgar Publishing.
- Betz, N. E., & Schifano, R. S. (2000). Evaluation of an Intervention to Increase Realistic Self-Efficacy and Interests in College Women. *Journal of Vocational Behavior, 56*(1), 35–52.  
<http://doi.org/10.1006/jvbe.1999.1690>
- Blustein, D. L., & Flum, H. (1999). A self-determination perspective of interests and exploration in career development. In M. L. Savickas & A. R. Spokane (Eds.), *Vocational interests:*



- Meaning, measurement, and counseling use* (pp. 345–368). Palo Alto, CA, US: Davies-Black Publishing.
- Blustein, D. L., & Noumair, D. A. (1996). Self and Identity in Career Development: Implications for Theory and Practice. *Journal of Counseling & Development*, 74(5), 433–441.  
<http://doi.org/10.1002/j.1556-6676.1996.tb01889.x>
- Carter, N. M., Gartner, W. B., Shaver, K. G., & Gatewood, E. J. (2003). The career reasons of nascent entrepreneurs. *Journal of Business Venturing*, 18(1), 13–39.  
[http://doi.org/10.1016/S0883-9026\(02\)00078-2](http://doi.org/10.1016/S0883-9026(02)00078-2)
- Chai, S.-K. (2001). *Choosing an Identity: A General Model of Preference and Belief Formation*. Ann Arbor: University of Michigan Press.
- de Pillis, E., & Reardon, K. K. (2007). The influence of personality traits and persuasive messages on entrepreneurial intention: A cross-cultural comparison. *The Career Development International*, 12(4), 382–396. <http://doi.org/10.1108/13620430710756762>
- Diegelman, N. M., & Subich, L. M. (2001). Academic and Vocational Interests as a Function of Outcome Expectancies in Social Cognitive Career Theory. *Journal of Vocational Behavior*, 59(3), 394–405. <http://doi.org/10.1006/jvbe.2001.1802>
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: Norton.
- European Union. (2006). Recommendation of the European Parliament and of the Council on key competences for lifelong learning. *Official Journal of the European Union*, 49(L 394). Retrieved from <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32006H0962>

- Fayolle, A., Gailly, B., & Lassas-Clerc, N. (2006). Assessing the impact of entrepreneurship education programmes: a new methodology. *Journal of European Industrial Training*, 30(9), 701–720. <http://doi.org/10.1108/03090590610715022>
- Fouad, N. A. (2007). Work and Vocational Psychology: Theory, Research, and Applications. *Annual Review of Psychology*, 58(1), 543–564.  
<http://doi.org/10.1146/annurev.psych.58.110405.085713>
- Fouad, N. A., & Smith, P. L. (1996). A test of a social cognitive model for middle school students: Math and science. *Journal of Counseling Psychology*, 43(3), 338–346.  
<http://doi.org/10.1037/0022-0167.43.3.338>
- Gati, I. (2013). Advances in Career Decision Making. In W. B. Walsh, M. L. Savickas, & P. J. Hartung (Eds.), *Handbook of Vocational Psychology: Theory, Research, and Practice* (4th ed., pp. 183–216). New York, NY: Routledge.
- Grubb, W. N. (2002). Who Am I: The Inadequacy of Career Information in the Information Age. Retrieved from <http://eric.ed.gov/?id=ED478645>
- Haddock, G., Maio, G. R., Arnold, K., & Huskinson, T. (2008). Should persuasion be affective or cognitive? The moderating effects of need for affect and need for cognition. *Personality and Social Psychology Bulletin*, 34(6), 769–778.  
<http://doi.org/10.1177/0146167208314871>
- Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology*, 67(3), 451–470. <http://doi.org/10.1111/bmsp.12028>
- Holland, J. L. (1959). A theory of vocational choice. *Journal of Counselling Psychology*, 6, 35–45.

- Holland, J. L. (1985). *Making vocational choices: A theory of vocational personalities and work environments* (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.
- Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Odessa, FL: Psychological Assessment Resources.
- Iyer, R. (2015, September 7). Encouraging entrepreneurship as a career option among youth. Retrieved December 7, 2015, from <http://www.entrepreneur.com/article/250369>
- Krueger, J., & Norris, F. (2007). What Lies Beneath? The Experiential Essence of Entrepreneurial Thinking. *Entrepreneurship Theory and Practice*, 31(1), 123–138. <http://doi.org/10.1111/j.1540-6520.2007.00166.x>
- Krueger, J., Norris, F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5–6), 411–432. [http://doi.org/10.1016/S0883-9026\(98\)00033-0](http://doi.org/10.1016/S0883-9026(98)00033-0)
- Krumboltz, J. D., Becker-Haven, J. F., & Burnett, K. F. (1979). Counseling Psychology. *Annual Review of Psychology*, 30(1), 555–602. <http://doi.org/10.1146/annurev.ps.30.020179.003011>
- Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a Unifying Social Cognitive Theory of Career and Academic Interest, Choice, and Performance. *Journal of Vocational Behavior*, 45(1), 79–122. <http://doi.org/10.1006/jvbe.1994.1027>
- Lent, R. W., Brown, S. D., Sheu, H.-B., Schmidt, J., Brenner, B. R., Gloster, C. S., ... Treistman, D. (2005). Social Cognitive Predictors of Academic Interests and Goals in Engineering: Utility for Women and Students at Historically Black Universities. *Journal of Counseling Psychology*, 52(1), 84.

- Liberal Party of Canada. (2015, November 19). Jobs and innovation. Retrieved November 19, 2015, from <https://www.liberal.ca/realchange/jobs-and-innovation/>
- Liñán, F., & Chen, Y.-W. (2009). Development and Cross-Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions. *Entrepreneurship Theory and Practice*, 33(3), 593–617. <http://doi.org/10.1111/j.1540-6520.2009.00318.x>
- Lopez, F. G., Lent, R. W., Brown, S. D., & Gore, P. A. (1997). Role of social-cognitive expectations in high school students' mathematics-related interest and performance. *Journal of Counseling Psychology*, 44(1), 44–52. <http://doi.org/10.1037/0022-0167.44.1.44>
- Morris, S. B., & DeShon, R. P. (2002). Combining effect size estimates in meta-analysis with repeated measures and independent-groups designs. *Psychological Methods*, 7(1), 105–125. <http://doi.org/10.1037/1082-989X.7.1.105>
- Obschonka, M., Silbereisen, R. K., & Schmitt-Rodermund, E. (2010). Entrepreneurial intention as developmental outcome. *Journal of Vocational Behavior*, 77(1), 63–72. <http://doi.org/10.1016/j.jvb.2010.02.008>
- Parsons, F. (1909). *Choosing a vocation*. Boston, MA: Houghton Mifflin.
- Peterman, N. E., & Kennedy, J. (2003). Enterprise Education: Influencing Students' Perceptions of Entrepreneurship. *Entrepreneurship Theory and Practice*, 28(2), 129–144. <http://doi.org/10.1046/j.1540-6520.2003.00035.x>
- Pope, M. (2015). Career Intervention: From the Industrial to the Digital Age. In P. J. Hartung, M. L. Savickas, & B. W. Walsh (Eds.), *APA Handbook of Career Intervention* (Vol. 1). Washington, DC: American Psychological Association.

- Porfeli, E., Lee, B., & Vondracek, F. W. (2013). Identity Development and Careers in Adolescents and Emerging Adults: Content, Process, and Structure. In W. B. Walsh, M. L. Savickas, & P. Hartung (Eds.), *Handbook of Vocational Psychology: Theory, Research, and Practice*. New York, NY: Routledge.
- Praag, C. M. van. (1999). Some Classic Views on Entrepreneurship. *De Economist*, *147*(3), 311–335. <http://doi.org/10.1023/A:1003749128457>
- Praag, C. M. van, & Versloot, P. H. (2007). What is the value of entrepreneurship? A review of recent research. *Small Business Economics*, *29*(4), 351–382. <http://doi.org/10.1007/s11187-007-9074-x>
- Raskin, P. M., & Waterman, A. S. (1994). Identity and the career counseling of adolescents: The development of vocational identity. *Sage Focus Editions*, *169*, 155–155.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78. <http://doi.org/10.1037/0003-066X.55.1.68>
- Sánchez, J. C. (2010). University training for entrepreneurial competencies: Its impact on intention of venture creation. *International Entrepreneurship and Management Journal*, *7*(2), 239–254. <http://doi.org/10.1007/s11365-010-0156-x>
- Savickas, M. L. (2010). Foreword: Best practices in career intervention. In K. Maree (Ed.), *Career counselling: Methods that work* (pp. xi–xii). Cape Town, South Africa: Juta.
- Scanlan, T. J. (1980). Toward an occupational classification for self-employed men: An investigation of entrepreneurship from the perspective of Holland's theory of career development. *Journal of Vocational Behavior*, *16*(2), 163–172. [http://doi.org/10.1016/0001-8791\(80\)90047-0](http://doi.org/10.1016/0001-8791(80)90047-0)

- Schmitt-Rodermund, E. (2004). Pathways to successful entrepreneurship: Parenting, personality, early entrepreneurial competence, and interests. *Journal of Vocational Behavior*, 65(3), 498–518. <http://doi.org/10.1016/j.jvb.2003.10.007>
- Singer, N. (2015, December 28). Universities Race to Nurture Start-Up Founders of the Future. *The New York Times*. Retrieved from <http://www.nytimes.com/2015/12/29/technology/universities-race-to-nurture-start-up-founders-of-the-future.html>
- Singer, S., Amorós, J. E., & Moska, D. (2015). *Global Entrepreneurship Monitor, 2014 Global Report*. Babson Park, MA: Babson College.
- Skorikov, V., & Vondracek, F. W. (1998). Vocational Identity Development: Its Relationship to Other Identity Domains and to Overall Identity Development. *Journal of Career Assessment*, 6(1), 13–35. <http://doi.org/10.1177/106907279800600102>
- Souitaris, V., Zerbinati, S., & Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business Venturing*, 22(4), 566–591. <http://doi.org/10.1016/j.jbusvent.2006.05.002>
- Super, D. E. (1980). A life-span, life-space approach to career development. *Journal of Vocational Behavior*, 16(3), 282–298. [http://doi.org/10.1016/0001-8791\(80\)90056-1](http://doi.org/10.1016/0001-8791(80)90056-1)
- Swann, W. B., Stein-Seroussi, A., & Brian, R. (1992). Why people self-verify. *Journal of Personality and Social Psychology*, 62(3), 392–401. <http://doi.org/10.1037/0022-3514.62.3.392>
- Thompson, D. (2014, May 12). The Mysterious Death of Entrepreneurship in America. *The Atlantic*. Retrieved from

<http://www.theatlantic.com/business/archive/2014/05/entrepreneurship-in-america-is-dying-wait-what-does-that-actually-mean/362097/>

- Turner, S. L., & Lapan, R. T. (2005). Evaluation of an intervention to increase non-traditional career interests and career-related self-efficacy among middle-school adolescents. *Journal of Vocational Behavior, 66*(3), 516–531. <http://doi.org/10.1016/j.jvb.2004.02.005>
- U.S. Department of State. (2015, March 23). Spark Initiative: Promoting Global Entrepreneurship. Retrieved November 19, 2015, from <http://www.state.gov/e/eb/cba/entrepreneurship/spark/index.htm>
- Vanevenhoven, J., & Liguori, E. (2013). The Impact of Entrepreneurship Education: Introducing the Entrepreneurship Education Project. *Journal of Small Business Management, 51*(3), 315–328. <http://doi.org/10.1111/jsbm.12026>
- Vilhjalmsdottir, G. (2007). Outcomes of two different methods in careers education. *International Journal for Educational and Vocational Guidance, 7*(2), 97–110.
- Vondracek, F. W. (1992). The Construct of Identity and its Use in Career Theory and Research. *The Career Development Quarterly, 41*(2), 130–144. <http://doi.org/10.1002/j.2161-0045.1992.tb00365.x>
- Zanna, M. P. (1993). Message receptivity: A new look at the old problem of open- versus closed-mindedness. In *Advertising exposure, memory, and choice* (pp. 141–162). Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

## Tables

Table 1

*Pearson Correlations Between Condition, Change in Career Choice Factors, and Change in Intent*

	Condition	$\Delta$ Interest	$\Delta$ Outcomes	$\Delta$ Identity	$\Delta$ Intent
Condition	1				
$\Delta$ Interest	0.11	1			
$\Delta$ Outcomes	0.18*	0.60**	1		
$\Delta$ Identity	0.28**	0.35**	0.37**	1	
$\Delta$ Intent	0.22*	0.28**	0.28**	0.60**	1

*Note.* Condition coded as 0 = control and 1 = treatment.

\*  $p < 0.05$ . \*\*  $p < 0.01$ . Both two-tailed.



Table 2

*Indirect Effects with Motivation Sources as Mediators in Parallel (See Path Model in Figure 2)*

Mediation path	95% CI
Condition → Δ Interest → Δ Intent	[-0.02, 0.14]
Condition → Δ Outcomes → Δ Intent	[-0.05, 0.13]
Condition → Δ Identity → Δ Intent	[0.14, 0.56]

Table 3

*95% Confidence Intervals for Indirect Paths of Serial Mediation Model (See Path Model in Figure 3)*

Pathway	95% CI
Condition → Learning → Δ Identity → Δ Intent	[0.14, 0.41]

Table 4

*Pearson Correlations Between Condition & Learning, Learning &  $\Delta$  Identity, and  $\Delta$  Identity &  $\Delta$  Intent at Each Level of Enterprising Interests*

Enterprising interest level	Condition & Learning	Learning & $\Delta$ Identity	$\Delta$ Identity & $\Delta$ Intent
Low	.45**	.07	.48**
Average	.57**	.44**	.64**
High	.62**	.66**	.58**

*Note.* \*  $p < .05$ . \*\*  $p < .01$ . Both two-tailed.

Table 5

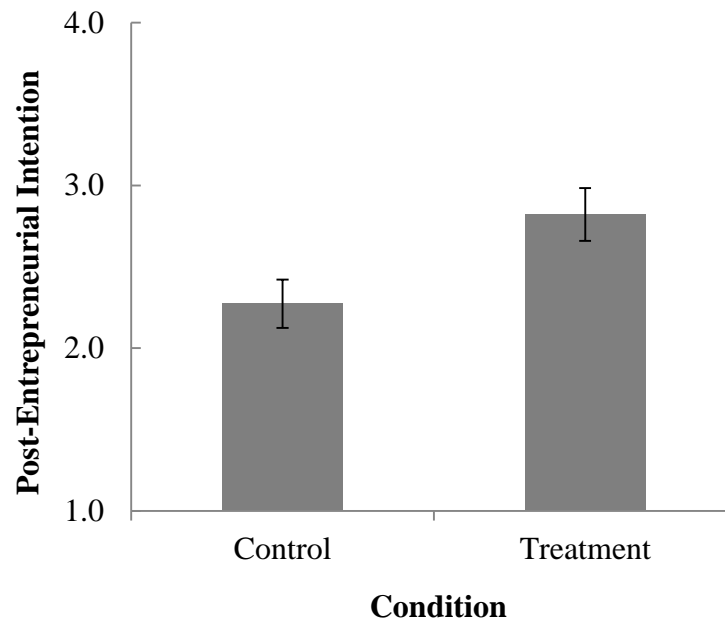
*95% Confidence Intervals for Moderation of the Path Between Learning and Change in Identity*

*(Refer to Path Model in Figure 4)*

Enterprising interest level	<i>Effect</i>	<i>SE</i>	<i>95% CI</i>
Low	.04	.05	[-.04, .14]
Average	.15	.05	[.07, .24]
High	.25	.70	[.13, .42]

*Note.* “Low” corresponds to -1SD of enterprising interests; “Average”, the mean; and “High”, +1SD.

## Figures



*Figure 1.* Mean entrepreneurial intent after discussion, by condition. Cohen's  $d = -.44$ .

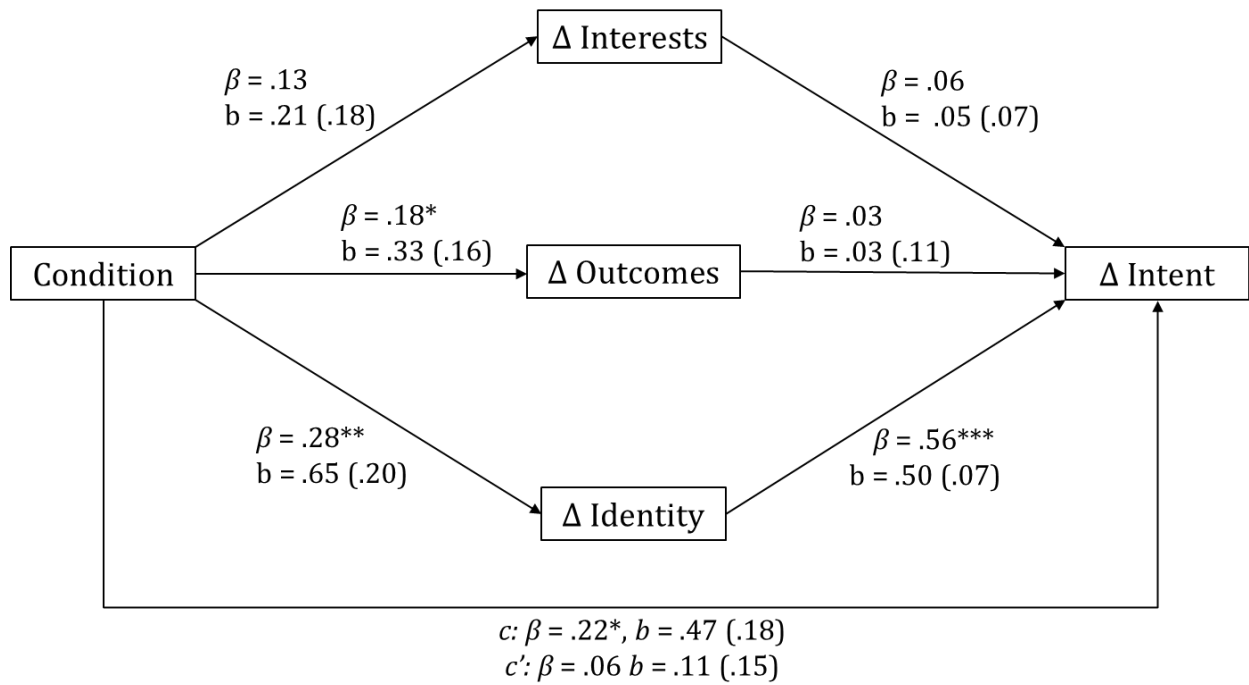
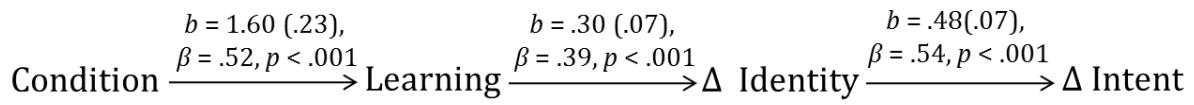
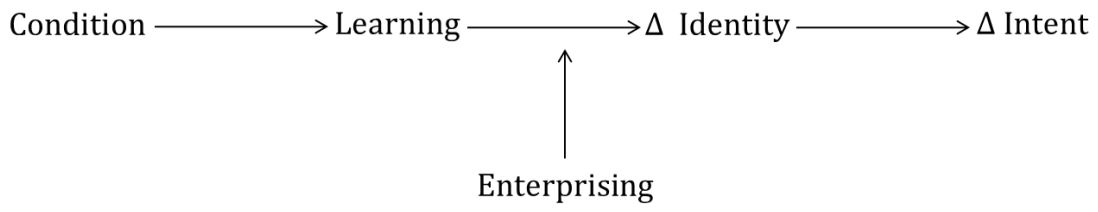


Figure 2. Path model of condition, change in motivation sources, and change in intent. Betas are standardized regression coefficients. Values in parentheses are p-levels.

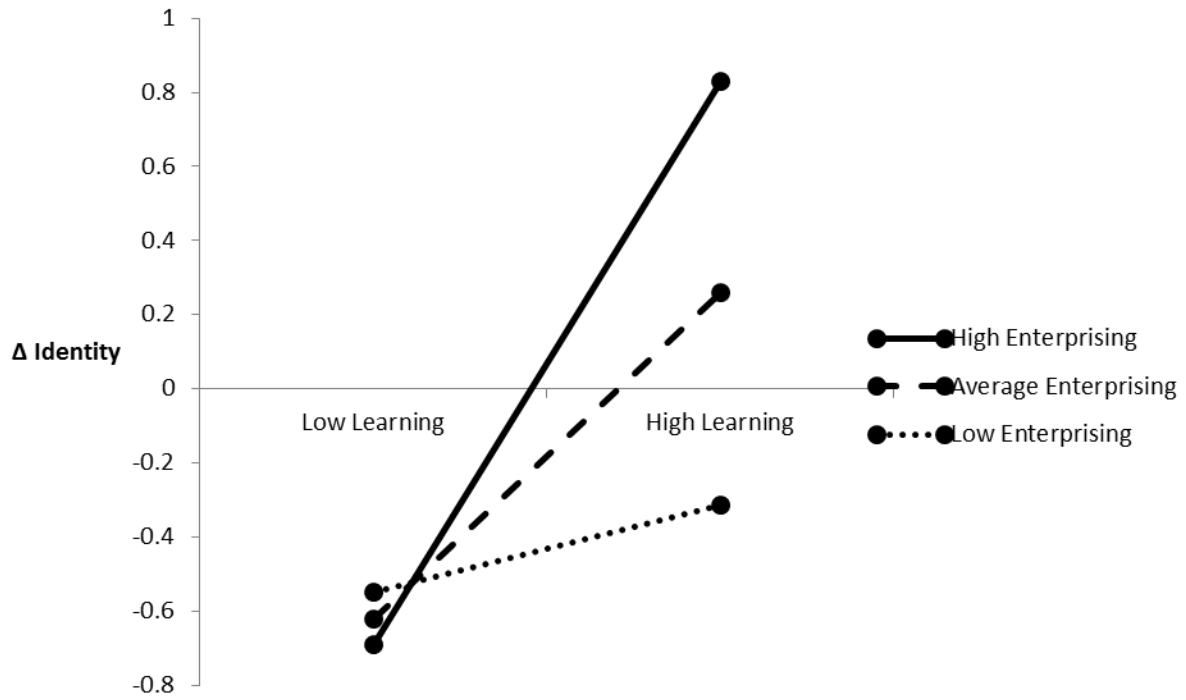


*Figure 3.* Path model for serial mediation model for learning and change in perception of identity involvement as mediators.



*Figure 4.* Path model for moderation of serial mediation model with enterprising as a moderator.





*Figure 5.* Interaction between level of learning and enterprising on change in perception of identity involvement.

*Note.* “High” corresponds to +1SD; “Average”, the mean; and “Low”, -1SD.

## Appendices

### Appendix A

#### Entrepreneurial Intention Measure

1. Indicate your level of agreement with the following statements from 1 (total disagreement) to 7 (total agreement)

	<b>Total Disagreement (1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>Total Agreement (7)</b>
<b>1) I am ready to do anything to be an entrepreneur.</b>	0	0	0	0	0	0	0
<b>2) My professional goal is to become an entrepreneur.</b>	0	0	0	0	0	0	0
<b>3) I will make every effort to start and run my own firm.</b>	0	0	0	0	0	0	0
<b>4) I am determined to create a firm in the future.</b>	0	0	0	0	0	0	0
<b>5) I have very seriously thought of starting a firm.</b>	0	0	0	0	0	0	0
<b>6) I have the firm intention to start a firm some day.</b>	0	0	0	0	0	0	0

## Appendix B

### Involvement of Vocational Interests Measure

Please think about your concept of entrepreneurship.

If you were to pursue entrepreneurship as a career, to what extent do you imagine that you would...

	<b>Not at all</b>		<b>To a small extent</b>		<b>To some extent</b>		<b>To a large extent</b>		<b>Com- pletely</b>
...be pursuing your own work activity preferences	○	○	○	○	○	○	○	○	○
...be doing enjoyable work	○	○	○	○	○	○	○	○	○
...be doing interesting work	○	○	○	○	○	○	○	○	○
...find your work to be engaging	○	○	○	○	○	○	○	○	○
...find your work to be pleasant	○	○	○	○	○	○	○	○	○

## Appendix C

### Expected Outcomes Measure

The following statements describe some possible consequences that could occur as a result of taking on *entrepreneurship* as a career.

Please indicate the extent of your agreement or disagreement with these statements *as they would apply to you*, personally.

Please answer *without* taking into account how likely you are to become an entrepreneur. Just picture yourself as an entrepreneur, and answer in ways that tell what you expect that the consequences would be to *you*.

As an entrepreneur . . .

	Totally Disagree	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree	Totally Agree
. . . I would have job security									
. . . I would gain higher social status									
. . . I would experience a feeling of personal accomplishment									
. . . I would be contributing to society									
. . . I would have work flexibility (e.g. choosing one's own work hours)									
. . . I would have positive work-life balance									
. . . I would experience distress from the risk involved in entrepreneurship									

	Totally Disagree	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree	Totally Agree
... I would be in a position of authority									
... I would have to make a lot of personal sacrifices (e.g. time with family and friends, hobbies, sleep)									
... I would have a more satisfying social network									
... I would make best use of my abilities, talents, and skills									
... I would have a satisfactory income									

## Appendix D

### Identity-Congruence Measure

Please circle the picture that best describes the extent to which you see your personal characteristics, life goals, values, and aspirations as being the same as those of an entrepreneur.



## Appendix E

### Learning About Entrepreneurship & Career Choice Factors Measure

From this session, I learned some new things about how entrepreneurship can...

	<b>Strongly Disagree (1)</b>	<b>Disagree (2)</b>	<b>Slightly disagree (3)</b>	<b>Neutral (4)</b>	<b>Slightly agree (5)</b>	<b>Agree (6)</b>	<b>Strongly agree (7)</b>
1. ...provide psychological benefits that are important to me such as sense of fulfilment	○	○	○	○	○	○	○
2. ...be enjoyable in ways that are important to me	○	○	○	○	○	○	○
3. ...provide opportunities for pleasurable work	○	○	○	○	○	○	○
4. ...fit my personal values or life goals	○	○	○	○	○	○	○
5. ...provide material benefits that I would want	○	○	○	○	○	○	○
6. ...allow me to perform activities that I find to be inherently engaging	○	○	○	○	○	○	○
7. ...enable me to work on tasks that I find to be pleasant	○	○	○	○	○	○	○
8. ...be consistent with how I see myself	○	○	○	○	○	○	○

Continued on next page →

	<b>Strongly Disagree (1)</b>	<b>Disagree (2)</b>	<b>Slightly disagree (3)</b>	<b>Neutral (4)</b>	<b>Slightly agree (5)</b>	<b>Agree (6)</b>	<b>Strongly agree (7)</b>
9. ...provide intangible benefits that I would want such as being in authority or having control over my work	0	0	0	0	0	0	0
10. ...correspond with my image of who I want to be	0	0	0	0	0	0	0
11. ...provide tangible benefits that I would want such as income or perks	0	0	0	0	0	0	0
12. ...allow me to engage in activities I find interesting	0	0	0	0	0	0	0
13. ...be a natural fit for me as a career, given the kind of person I am	0	0	0	0	0	0	0
14. ...be suitable for me given who I am	0	0	0	0	0	0	0
15. ...offer a variety of different benefits I would desire	0	0	0	0	0	0	0



## Appendix F

### Vocational Preference Inventory

Please rate how much you would like (or dislike) your job to involve each of the following job activities:

	Strongly Dislike	Dislike	Neither Dislike/Like	Like	Strongly Like
1) Negotiate contracts for professional athletes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Compose or arrange music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Sell houses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Teach children how to read	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Help elderly people with their daily activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Determine the infection rate of a new disease	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Teach an individual an exercise routine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) Design artwork for magazines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9) Work with mentally disabled children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10) Assist senior level accountants in performing bookkeeping tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11) Sell merchandise at a department store	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12) Conduct a symphony orchestra	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13) Repair household appliances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14) Handle customers' bank transactions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Dislike	Dislike	Neither Dislike/Like	Like	Strongly Like
15) Assemble electronic parts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16) Play a musical instrument	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17) Make a map of the bottom of an ocean	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18) Manage the operations of a hotel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19) Study ways to reduce water pollution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20) Write reviews of books or plays	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21) Transfer funds between banks using a computer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22) Give a presentation about a product you are selling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23) Sell restaurant franchises to individuals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24) Do research on plants or animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25) Teach a high-school class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26) Build a brick walkway	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27) Keep shipping and receiving records	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28) Test the quality of parts before shipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29) Do laboratory tests to identify diseases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30) Give career guidance to people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Dislike	Dislike	Neither Dislike/Like	Like	Strongly Like
31) Create special effects for movies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32) Study the movement of planets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33) Maintain employee records	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34) Work with juveniles on probation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35) Compute and record statistical and other numerical data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36) Work on an offshore oil-drilling rig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37) Study whales and other types of marine life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38) Direct a play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39) Build kitchen cabinets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40) Manage a clothing store	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41) Use a computer program to generate customer bills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42) Set up and operate machines to make products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43) Generate the monthly payroll checks for an office	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44) Design sets for plays	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45) Fix a broken faucet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
46) Help conduct a group therapy session	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Dislike	Dislike	Neither Dislike/Like	Like	Strongly Like
47) Manage a department within a large company	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
48) Develop a new medical treatment or procedure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix G

### Consent Form

**Title of Study**

Exploring motivational factors in career choice

**Faculty Investigator:**

Dr. John Michela (jmichela@uwaterloo.ca)  
519-888-4567 x32164  
University of Waterloo, Dept. of Psychology

**Student Investigator:**

K. Yourie Kim (ky8kim@uwaterloo.ca)  
University of Waterloo, Dept. of Psychology

**Research Assistant:**

Caroline Bhaskar (cbhaskar@uwaterloo.ca)  
University of Waterloo, Dept. of Psychology

As a participant in the study you will engage in a group discussion with a facilitator concerning aspects of university experience and life after university. Before and after the discussion, some questionnaires about mood, motivation, beliefs, and interests will be administered. The facilitator will either be Yourie Kim and Caroline Bhaskar, two of the researchers on the project. The study will take 1 hour. The discussion portion will count for .5 credit and the completion of the questionnaires will count for .5 credit, for a total of 1 credit for the entire session.

There are no known or anticipated risks to your participation in this session. You may decline answering any questions you feel you do not wish to answer both in the discussion and the questionnaires and may decline contributing to the session in other ways if you so wish. All information you provide will be considered confidential. No faculty members will be present during the session and your name will not be identified with the input you give to this session. Further, you will not be identified by name in the report that the facilitator produces for this session. The information collected from this session will be kept for a period of seven years in our research lab in the Psychology, Anthropology, Sociology (PAS) building.

Given the group format of this session we will ask you to keep in confidence information that identifies or could potentially identify a participant and/or his/her comments. If you have any questions about participation in this session, please feel free to discuss these with the facilitator, or later, by contacting Dr. John Michela at 519-888-4567, Ext. 32164. If you are interested in receiving a copy of the executive summary of the session outcomes, please contact the facilitator, Yourie Kim, at [ky8kim@uwaterloo.ca](mailto:ky8kim@uwaterloo.ca), or Caroline Bhaskar, at [cbhaskar@uwaterloo.ca](mailto:cbhaskar@uwaterloo.ca).

I would like to assure you that this study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee. However, the final decision about participation is yours. Should you have comments or concerns resulting from your participation in this study, please contact Dr. Maureen Nummelin in the Office of Research Ethics at 1-519-888-4567, Ext. 36005 or [maureen.nummelin@uwaterloo.ca](mailto:maureen.nummelin@uwaterloo.ca).

Thank you for your assistance with this project.

Yours sincerely,

Dr. John Michela  
Associate Professor  
Department of Psychology  
University of Waterloo

K. Yourie Kim  
Ph.D. Student  
Department of Psychology  
University of Waterloo

Caroline Bhaskar  
Research Assistant  
Department of Psychology  
University of Waterloo

### Agreement to Participate

By signing this consent form, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

---

I have read the information presented in the information letter about the session being facilitated by *Yourie Kim or Caroline Bhaskar*. I have had the opportunity to ask the facilitator any questions related to this session, to receive satisfactory answers to my questions, and any additional details I wanted. I am aware that I may withdraw from the session without penalty at any time by advising the facilitator of this decision.

This project has been reviewed by and received ethics clearance through a University of Waterloo Research Ethics Committee. I understand that if I have any comments or concerns resulting from my participation in this study, I may contact the Director, Office of Research Ethics at 519-888-4567, Ext. 36005.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this session and to keep in confidence information that could identify specific participants and/or the information they provided.

---

Print Name

---

@uwaterloo.ca  
Waterloo email address

---

Signature

---

Date

---

Witness

## Appendix H

### Discussion Poster for Treatment Group

# STAGES OF ENTREPRENEURSHIP

1 RECOGNIZE AN OPPORTUNITY	2 DEVELOP THE CONCEPT	3 MARSHALL RESOURCES	4 BUILD AN ORGANIZATION	5 LEAD AND MOTIVATE
<p>Identify ideas that can potentially be a marketable product or service</p> <ul style="list-style-type: none"> <li>- Observe trends</li> <li>- Solve a problem</li> <li>- Fill a gap in the market</li> </ul> <p><i>Example:</i> A swimsuit with SPF protection</p>	<p>Develop the idea and take the idea from dream to reality</p> <p><i>Example:</i> Research and development for a more safe and efficient pressure cooker</p>	<p>Find and bring together partners, mentors, alliance members, and investors</p> <p><i>Example:</i> Dragon's Den</p>	<p>Design the structure of the organization and allocate resources for different areas of the business such as marketing, manufacturing, distribution, etc.</p> <p><i>Example:</i> Plan the allocation of funds, employees, and work space across departments</p>	<ul style="list-style-type: none"> <li>- Ensure effective management of functional areas (e.g., HR, finance)</li> <li>- Motivate high performance by instilling commitment to organizational priorities</li> <li>- Communicate the vision and mission of organization</li> </ul> <p><i>Example:</i> Steve Jobs' inspirational speeches</p>

## Appendix I

Outcomes Handout for Treatment Group

### Benefits of Being an Entrepreneur

#### **Tangible benefits**

*In other words, what are some material or tangible advantages of a career in entrepreneurship?  
e.g. money*

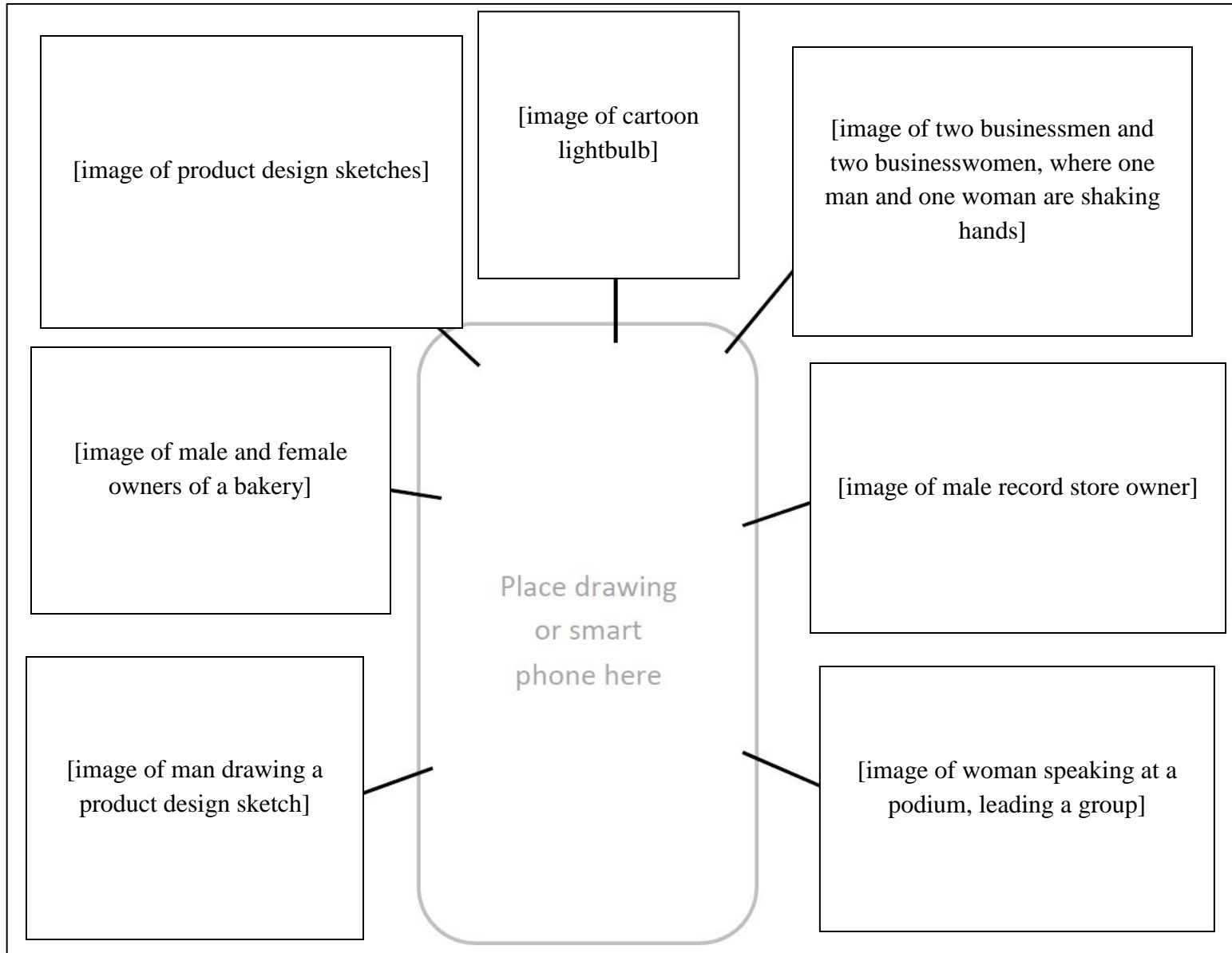
#### **Intangible benefits**

*In other words, what are some non-material advantages of a career in entrepreneurship?  
e.g. feeling of autonomy*



## Appendix J

### Template of Handout for Entrepreneurship Selfie Exercise



## Appendix K

Identity Handout for Treatment Group

### Myself as an Entrepreneur

**As an entrepreneur, how might you promote your personal values or your life goals?**

*In other words, what personal values or life goals could be attained by becoming entrepreneur?*

## Appendix L

Discussion Poster for Control Group

# THE FOUNDATIONAL PILLARS & GOALS OF UNIVERSITY OF WATERLOO'S STRATEGIC PLAN

ACADEMIC EXCELLENCE	RESEARCH EXCELLENCE & IMPACT	CO-OPERATIVE EDUCATION	INTERNATIO- NALIZATION	ENTREPRE- NEURSHIP
<p>Offer leading-edge, dynamic academic programs</p> <p>Be a leading provider of technology-enabled learning opportunities</p>	<p>Increase the worldwide impact and recognition of University of Waterloo research</p>	<p>Be the world-leading university in co-op education and other forms of experiential and work-integrated learning</p>	<p>Become one of the most internationalized universities in Canada</p>	<p>Solidify Waterloo's global leadership in all forms of entrepreneurship education and practice</p>

## Appendix M

Student Experience Handout for Control Group

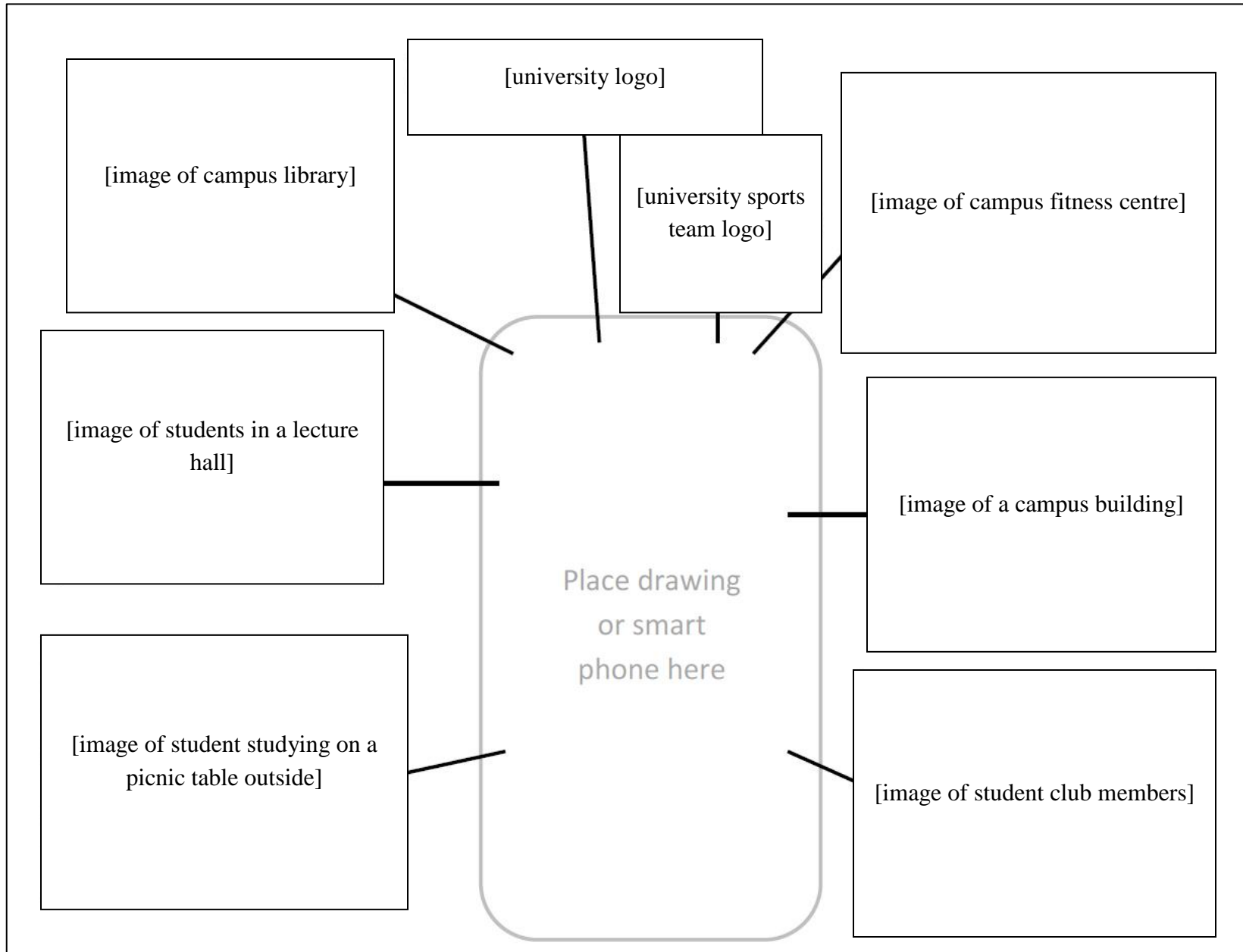
### The Student Experience at the University of Waterloo

*What are some examples of student life that you enjoy at the University of Waterloo?*

*What are some ways that the student life experience can be improved at the University of Waterloo?*

## Appendix N

### Template of Handout for Student Life Selfie Exercise



## Appendix O

Identity Handout for Control Condition

### Myself as a University of Waterloo Student

**As a University of Waterloo student, how might you promote your personal values or your life goals?**

*In other words, what personal values or life goals can be satisfied by being a UW student?*

## Appendix P

### Debriefing Form

**Title of Study**

Exploring motivational factors in career choice

**Faculty Investigator:**

Dr. John Michela (jmichela@uwaterloo.ca)  
519-888-4567 x32164  
University of Waterloo, Dept. of Psychology

**Student Investigator:**

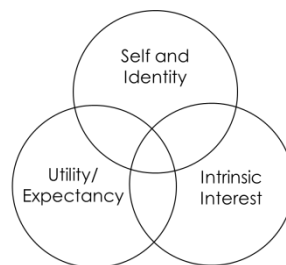
K. Yourie Kim (ky8kim@uwaterloo.ca)  
University of Waterloo, Dept. of Psychology

**Research Assistant:**

Caroline Bhaskar (cbhaskar@uwaterloo.ca)  
University of Waterloo, Dept. of Psychology

We appreciate your participation in our study, and thank you for spending the time helping us with our research!

In this study you participated in a group discussion about aspects of university experience and life after university. The purpose of this study was to test our novel theory that there are three motivational factors that come into play when people choose a career, in the case of our study, entrepreneurship. We hypothesize that the three factors are: intrinsic interests, which relates to work activities that one would find inherently interesting; utility/expectancy, the outcomes one would expect from a particular career; and self and identity, the extent to which one sees congruence between how one perceives him or herself and the career. We believe that these factors are arranged in the following scheme:



We had two types of discussion groups: one was the treatment and the other was the control. In the treatment group, participants discussed each of the motivational factors as they relate to entrepreneurship. In other words, the work activities (intrinsic interest) and the benefits and costs (utility/expectancy) involved in entrepreneurship and the type of person they think would become an entrepreneur (self and identity). In the control group, participants discussed the student experience at the University of Waterloo. They did not discuss the motivational factors in career choice.

We expect that, in the treatment group, a discussion of the three motivational factors would widen participants' view of entrepreneurship and potentially lead them to discover their potential suitability to becoming one. As a result, compared to those in the control group, we expect a greater increase in entrepreneurial intent and more engagement in career search on the provided online resource.

All information you provided is considered completely confidential; indeed, your name will not be included or in any other way associated, with the data collected in the study. Paper records of data collected during this study will be retained for 7 years in a locked filing cabinet, to which only researchers associated with this study have access. Electronic data will be kept for 7 years on a secure computer in a locked room, to which only researchers associated with this study have access. All identifying information will be removed from the records prior to storage.

This project has been reviewed by, and received ethics clearance through a University of Waterloo Research Ethics Committee. In the event you have any comments or concerns resulting from your participation in this study, please contact Dr. Maureen Nummelin, the Director, Office of Research Ethics, at 1-519-888-4567, Ext. 36005 or [maureen.nummelin@uwaterloo.ca](mailto:maureen.nummelin@uwaterloo.ca).

If you think of some other questions regarding this study, please do not hesitate to contact the student investigator, Yourie Kim, at [ky8kim@uwaterloo.ca](mailto:ky8kim@uwaterloo.ca).

We appreciate your participation, and hope that this has been an interesting experience for you.