ENHANCING CAREER DEVELOPMENT AGENCY IN EMERGING ADULTHOOD: AN INTERVENTION USING DESIGN THINKING

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Career development is an important part of emerging adulthood, the period when 18- to 30-year-olds in modern societies explore possible roles, occupations and lifestyles (Arnett, 2000). To date, most theories and interventions have focused on career decision-making (Betz, 2007); however, for emerging adults embarking on the school-to-work transition, making a single, final career decision can be a source of anxiety and depression (Rottinghaus, Jenkins & Jantzer, 2009). This study investigated the effects of a course on career development for undergraduate juniors and seniors, which used an innovative “design thinking” curriculum to help students plan creatively for life after college. The intervention was hypothesized to increase students’ career development agency, a new construct based on Bandura’s (1989) theory of how individuals think and act intentionally. The intervention was also hypothesized to decrease participants’ psychological distress related to career concerns.

The study used a quasi-experimental approach with an intervention (treatment) condition and two comparison conditions, one consisting of college students who applied for the treatment but were waitlisted, and another drawn from the general student body. An online questionnaire was administered at the beginning and after the end of the ten-week academic quarter. A multivariate analysis of variance with repeated measures showed that class participants (n = 42) increased in career development self-efficacy, and moderately decreased in career-related negative affect. The comparison conditions (n = 62) did not show these outcomes. Students in the comparison conditions also reported a rise in dysfunctional career-related beliefs, which their peers in the class did not experience. Importantly, course participants’ levels of career uncertainty did not change, on average, nor did they report changes in stressful life events or situations. The effect of the intervention was not to promote career decision-making, but rather to build self-confidence through productive action, and counteract common myths about career issues in emerging adulthood. Finally, regression analyses indicated that factors of career development agency (self-efficacy and contextual stressors) were more directly predictive of career-related negative affect than career uncertainty.
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CHAPTER 1. INTRODUCTION

"A creative life is risky business.” - Stephen Nachmanovitch, Free Play: Improvisation in Life and Art

“What are you going to do?” It is a simple question. In certain contexts, it is innocuous: there are easy answers when you have found out that your cat has fleas again, or that an afternoon is unexpectedly free of engagements. In some situations, however, the query is heavy with import: when posed to a man who has just been laid off, for example, or to a young woman about to finish her education and enter the workforce. It is customary for near-strangers to ask children and teenagers what they plan to do “when you grow up”. In Western culture today, the unspoken standard communicated is that a specific, stable occupational plan is necessary for success and happiness. “I’m still figuring it out,” is rarely an acceptable response.

It is an arguably universal human characteristic to fear the unknown, and avoid uncertainty and ambiguity. In the modern domain of career choice, however, condemning uncertainty is misguided (Krumboltz, 1992, 2009). Certainty is maladaptive in a dynamic, fast-paced environment such as the labor market today. Stability is unlikely given the fact that workers hold multiple jobs in their lifetimes – nearly eleven, on average, between the ages of 18 and 42, according to analysis of the National Longitudinal Survey of Youth (Pierret, 2005).

Though many perceive career uncertainty as a catastrophe or personal failure, there are also those young people who can say, comfortably, that they are taking a year off of school, or waiting to see what will happen rather than forcing the issue. For these lucky ones, career indecision is not necessarily stressful. In the absence of true enlightenment, or a big trust fund, the explanation is often that they are equipped with a firm sense of self-confidence, a belief in their ability to actively cope with whatever happens, and a positive outlook on the world. In psychology, this desirable state can be described with many global constructs, such as resilience (Rutter, 1987), proactive
personality (Brown, Cober, Kane, Levy and Shalhoop, 2006), autonomy (Bridges, 2003) and self-authorship (Pizzolato, 2003). Bandura’s (1989) theory of agency, however, is especially useful because the construct can be defined within a given domain, and there is a large body of theoretical and experimental work that provides specific recommendations for targeted interventions.

In this dissertation, I will describe the effects of an intervention for college students, which was built on the thesis that career indecision does not have to be a source of stress and unhappiness. My aim is to encourage educators, counselors and psychologists to focus on ways to increase young adults’ long-term career development agency rather than their immediate decidedness. In this chapter, I will set the stage for the research by describing the theoretical background and empirical work on early adulthood, career indecision and career development. I will argue the following:

1. Emerging adulthood is the time of major personal and professional transitions, particularly the transition from school to full-time employment.
2. Some emerging adults experience negative affect related to the school-to-work transition, such as anxiety and distress.
3. One traditional hypothesis is that those who are decided about their careers experience the transition positively, while those who are undecided experience it negatively.
4. The “career decidedness” hypothesis fails to account for young people who are decided about their careers, but unhappy, or undecided about their careers, but flourishing.
   a) Furthermore, career indecision (or uncertainty) is not necessarily harmful or developmentally inappropriate in emerging adulthood.
   b) An explanation for why some emerging adults flourish despite career uncertainty is that they have a stronger sense of their own agency, which allows them to take advantage of the positive opportunities of transitional periods.
5. Agency is an important construct because it is more durable and relevant than career decidedness, given the many life and work transitions that emerging adults will eventually face.
One innovative intervention that may increase career development agency is a problem-solving methodology called “design thinking”.

EMERGING ADULTHOOD AND CAREER TRANSITIONS

As coined by Arnett (2000), the term emerging adulthood refers to the time period from the late teens through the late 20s, during which people in modern societies explore opportunities and identities in many important areas such as relationships, lifestyle and career. According to this developmental theory, emerging adulthood is a new life stage that has appeared in the last fifty years due to demographic and social changes, including later ages for marriage and children, greater participation in higher education, and longer latencies before committing to a permanent residence and occupation (Arnett, 2004). For example, marriage rates for people in the United States, ages 20 to 29, have almost exactly inverted from 1968 to 2010. In 1968, 71% of participants in the Current Population Survey were married; in 2010, 69% had never married (US Census Bureau, 2010). As a result of multiple convergent social shifts, many young adults have the time, freedom and social permission to explore various identities and roles. Naturally, in addition to this sense of possibilities, they also experience a great deal of instability and feeling “in-between” childhood and true adulthood. In the last decade, researchers have begun investigating the characteristics and challenges of emerging adulthood as an empirically distinct and heuristically useful life stage (for example, Cote, 2008; Konstam, 2007).

Emerging adulthood is a time of not one but many arenas of personal growth and decision-making (Arnett, 2006; Arnett and Brody, 2008). People in their late teens and twenties are finishing school and deciding what to do next: take time off, get more training, go into the workforce, or move to an entirely new geographic area. Emerging adults are also forming more serious and long-term romantic relationships, and potentially living with partners or spouses. They may be deciding whether they want to start families, and when. It is also a time when they may be renegotiating and redefining their relationships with parents and other family members. Finally, emerging adulthood can be a time of significant financial stress, as individuals may have loans from
schooling, expenses associated with relocating, or are experiencing complete financial independence for the first time. Complicating it all, according to Bridges (1980), is the “twisted old feeling that if you’d only done things properly, you would have had everything settled once and for all by twenty-five or so,” (p. 36).

Recognizing emerging adulthood as a unique part of the modern life span is a productive move in developmental and educational psychology because it legitimizes the experiences of emerging adults and encourages social institutions to support the specific needs of people in this stage. An analogy can be drawn from G. Stanley Hall’s introduction of adolescence as a new life stage in 1904. While previous societies had only recognized the difference between childhood to adulthood, social changes that prohibited child labor and increased educational requirements gave people ages 12 to 18 the opportunity to postpone adult commitments while developing beyond childhood behaviors and capacities. As Henig (2010) notes, cultural acceptance of adolescence led to the adoption of supportive social and political structures, such as a separate middle school between elementary and high school, and increased decision-making privileges for teenagers. Likewise, Arnett (2003) notes the need for greater awareness, acceptance and assistance in regards to the particular struggles and tasks of emerging adulthood.

While the theory of emerging adulthood has gained a great deal of acceptance, some have criticized it for focusing on young people who are Western, typically middle-class and relatively privileged. Arnett acknowledges this objection and limits the application of emerging adulthood to modern industrial societies. Hendry and Kloep (2010), however, argue that Arnett’s theory should be scoped even further, to only those young adults who engage in higher education. In their interview study of 38 Welsh youth, aged 17 to 20 years, who were not in higher education, they found that Arnett’s hallmarks of emerging adulthood did not apply universally. Many men and women in their late teens and early 20s did not report identity exploration, had made relatively stable life choices, were not particularly self-focused, and did not perceive their lives as full of possibilities. Hendry and Kloep characterize some of these young people as ‘prevented adults’ and others as ‘adults’, rather than ‘emerging adults’. They noted that significant
life events such as getting married, having a child, or being unable to enter higher education due to low academic achievement could catalyze or prevent adulthood, in either case circumventing emerging adulthood.

In a similar vein, Shildrick and MacDonald (2007) argue that much of the work on emerging adulthood ignores the phenomenological experience of the young people themselves, particularly those who are economically and socially marginalized. In their longitudinal, qualitative study of ‘hard-to-reach’ young English people (N = 186) living in very poor areas, they found that while these people in their early- to mid-20s seemed to experience the instability, insecurity, and searching for identity associated with emerging adulthood, the reasons for and subjective experience of these phenomena were very different. While many of these young people did change jobs many times, it was not because they were searching for their passion or calling. Instead, it was because they were dissatisfied and bored with low-skill, poorly compensated work. They also had difficulty retaining jobs, partially due to their own dispositional characteristics, but also due to a business environment in which companies made no attempt to retain their cheap labor force. While some of these disadvantaged young people engaged with higher education or vocational training, their patterns of dropping out or changing programs did not reflect the emerging adulthood concept of searching for identity, but more typically, a cultural belief that higher education was not appropriate for them, and a sense of resigned pessimism that academic achievement was not within their capacities.

While it is important to recognize the possible exceptions and objections to the theory of emerging adulthood, a defense of the theory as developmentally and universally accurate is not part of this dissertation. Arnett, his colleagues, and other independent researchers have made significant progress in testing the theory of emerging adults in different socio-cultural contexts, and have had reasonable success in showing the applicability of the concept for diverse populations (Arnett and Galambos, 2003). If we look at the balance of evidence, it seems that emerging adulthood is at least a heuristically useful theory for describing the experiences of a significant number of young people living in modern, industrialized societies. Even if we were to limit our
analyses to young adults who participate in higher education, in the United States alone that number was 20.4 million in 2009 (U.S. Department of Education, 2011). In that same year, 41% of all 18 to 24-year-olds in the United States were enrolled in some form of higher education (U.S. Department of Commerce, 2010), and the enrollment rate is projected to rise. While there may be exceptions, and future work on human development may inform or alter this theory, this research will use emerging adulthood as one of its theoretical foundations.

Emerging adulthood is characterized strongly by Bridges’ (1980) concept of “transition”. Bridges makes the distinction between change, which is commonly feared, and transition, the internal process of coping with change. All transitions have three components: an ending, and in-between “neutral zone”, and a new beginning. Any ending in life can trigger a transition: an objective ending, such as graduation from college, or an ending known only to the individual, such as when you realize that an activity you used to like is no longer enjoyable. Once you accept that some small or large part of your life is over, you enter the neutral zone, when you no longer have the previous status, but you also do not have something else to replace it. During this time, individuals typically try different things and do not settle into a pattern of new behavior immediately. If suitable direction is found, there is a new beginning and adjustment period. A simple example is the running enthusiast who sustains a serious injury to her foot, which triggers the ends of her running days. In the neutral zone, she may try to replace running with other hobbies and experiment with many other sports or activities. When she finds a new interest in swimming, there is a new beginning in her life. This beginning can be a time of joy and discomfort, depending on how psychologically prepared she is for the uncertainties and differences of the novel situation.

In the context of emerging adulthood, the explicit changes typically include the end of formal education and the beginning of a career, and going from pre-adult to “real” adult, with all the responsibilities that entails. Bridges writes, “In the broadest sense, we might say that this time is one of ‘searching for a place’ and that the transitions likely to take place involve experimenting with an eye to making commitments… For [some]
people, the search for their place in the world involves dozens of transitions spread out over ten years, but for others, all the transitionality is compressed into one grand leap into marriage and career,” (p. 34). It is important to note that while this high-level transition characterizes most individuals, each person also experiences multiple levels of transitions, which are specific to that person. For example, for one college senior the transition that she struggles with the most may be going from financial dependence to greater financial independence. For another, the most salient transition may be the transformation from someone who is valued for his intellectual creativity into someone who is more defined by his productivity at work. Most people will experience multiple transitions during emerging adulthood, from the micro-level of daily routine to the macro-level of the biggest questions regarding work, love and life.

One of the primary areas in which emerging adults face choices and challenges is the domain of work and particularly, the school-to-work transition. While the personal and professional lives of emerging adults are diverse (Arnett, 2006), nearly all 18- to 30-year-olds have the experience of leaving school (secondary or post-secondary) and starting their first jobs. In an interview study of emerging and young adults, Konstam (2007) found that the theme of “finding one’s passion” or looking for meaning in work resonated with many. It is not surprising, then, that emerging adults experience a high rate of job change (Arnett, 2000). Hamilton (2006) argues that the chaotic employment patterns of working-class emerging adults could be described negatively as floundering (Osterman, 1980), or more neutrally as searching for the right “fit” or “match”.

**WELL-BEING FROM SCHOOL TO WORK**

For the young person about to leave school and enter the adult world of work and family commitments, the transitional period can be extremely difficult. Leaving behind the identity, location and social support that has characterized the previous twelve to sixteen years of formal schooling is a cause for legitimate grief and concern. The neutral zone can be a time of intense anxiety and erratic behavior, as people search for a stable pattern in a life that is suddenly become unfamiliar and unpredictable. Emerging adults who are not prepared for new beginnings may find themselves floundering when they
begin new jobs, roles and responsibilities after leaving home or school. If they have not let go of the past in a healthy manner, they may not be able to appreciate the positive aspects of their new life situations. Or, they may not perform well in their new positions if they have not made appropriate adjustments to their ways of thinking and behaving – for example, a junior consultant who relates to her colleagues as she did her sorority sisters will reduce her chances of interpersonal and professional success. Those who handle the ending period well are able to experience appropriate sadness without spiraling into depression or holding on to the past excessively.

To put it a bit more formally, we can say that the personal and professional transitions that take place during emerging adulthood are a potential threat to what are termed “subjective” and “psychological” well-being (Murphy, Blustein, Bohlig, and Platt, 2010). While human beings have been concerned with happiness since the beginning of philosophical thought (Aristotle, 1925) subjective and psychological well-being are formulations of this concern within the modern field of positive psychology (Seligman, 1998). Subjective well-being refers to how a person feels, or one’s general level of happiness. It is based on a hedonic perspective that emphasizes a person’s positive and negative affect, including emotions (short-term, event-based experiences), moods (longer-term, pervasive experiences), and temperament (long-term, general patterns of feeling). Subjective well-being also takes into account a person’s sense of satisfaction with his or her life (Lent & Brown, 2008).

Psychological well-being is based on a eudaimonic perspective, which takes into account a person’s objective situation as well as how he or she feels. Eudaimonia is often translated as flourishing or thriving; in Aristotle’s formulation, an individual must have both external goods and internal contentment in order to flourish. Goods that Aristotle valued, which are still valued today, include true friendship, health, and sufficient material resources. The key to a good life for Aristotle, however, was in exercising moral virtue, which had multiple personal and psychological components. In modern interpretations, psychological well-being also has many facets. According to Ryff (1989), it includes autonomy, personal growth, self-acceptance, purpose in life, environmental
mastery, and healthy social relationships. Naturally, psychological and subjective well-being interact. In Lent’s (2004) framework, eudaimonic well-being, or living well, is the means to hedonic well-being, or feeling good.

Blustein (2008) argues that work has a powerful influence on both subjective and psychological well-being, and other researchers have underscored the role of work in outcomes related to well-being, such as meaning in life (Dik & Hansen, 2008). Regardless of whether the career search process is difficult or smooth, many factors contribute to the likelihood of emerging adults facing some degree of stress related to the school-to-work transition. Perhaps most importantly, most 18-25 year olds have never made and fully implemented a career decision before, and lack the skills and confidence that one gains through such a learning experience. As such, they are significantly disadvantaged compared to the 40-year-old who has already launched and lived one successful career before deciding to change fields. In a case study of an Australian college graduate, Perrone and Vickers (2003) characterized the school-to-work transition as “very uncomfortable”. Reasons for this discomfort included uncertainty about future career path, inflated expectations about employment, lack of work experience, and feelings of low self-worth and disappointment caused by rejections from employers. In another interview study of recent college graduates in the US, Murphy, Blustein, Bohlig and Platt (2010) highlighted the need for young adults to have significant social support and personal resilience in order to deal with the challenges of transition. One participant in their study said, “After this whole final semester for me, it was hard… I don’t have a job, I have two classes and I graduate, and then what? And it was just a sad time,” (Murphy et al., p. 178). Unsurprisingly, many researchers in the field of career choice and development have called for career and personal counseling to work together to support young people about to make this transition (e.g., Super, 1980).

Emotional experience during emerging adulthood may also be important for employment outcomes. Cote, Saks and Zikic (2006) studied the relationship of positive and negative affect with actual employment outcomes for 123 university students. They found that those students who had high positive affect set clear and specific goals for
their job search, worked assiduously to find a job, and as a consequence received a significantly greater number of job offers than those with lower levels of positive affect. In an interesting experimental study, Raghunathan & Pham (1999) found that negative emotion influenced job-selection behavior. Undergraduates who said that they felt sad after imagining themselves in a sad situation (mother’s death) were more likely to subsequently prefer a job with a high salary but low security (Job A), while those who were made to feel anxious, by imagining that they might have cancer, were more likely to prefer a job with an average salary but high job security (Job B). Preference was measured using a 7-point Likert scale with Job A on one end and Job B on the other end of the scale. While neither choice is construed as the “right” one, it is important to acknowledge that emotional state does affect career choices and outcomes, and negative affectivity may have long-term consequences. Well-being in emerging adulthood may set the tone for later years. Howard, Galambos, and Krahn (2010) followed a cohort of 983 middle-class and working-class Canadian high school students from 1985 to 1999. They found that among the nearly 500 participants who stayed in the study throughout, those who reported more depressive symptoms when they were 18 were more likely to have lower life satisfaction (men only) or lower career satisfaction (women only) at age 32.

THE ROLE OF CAREER DECIDEDNESS

Historically, the difficult task of transitioning from school to work has been construed as a single career decision, and a vast literature exists regarding why occupational indecision is bad, and what can be done about it (Holland, 1977; Osipow, 1999; Uthayakumar, Schimmack, Hartung, and Rogers, 2010). There are certainly a number of intuitive reasons why career indecision can be stressful or harmful. First, the multitude of areas in which emerging adults are making significant decisions means that vocational plans can only receive a fraction of a young person’s attention, time and concern. Second, society seems to expect that young people will be able to make “good” decisions about their careers, where “good” is defined as both speedy and socially prestigious. The teenager who can swiftly say state her plans to become a physician receives more social approval than the one who hesitates and says he might go into theater (Krumboltz, 1992). Third, there is little institutional support for career decision-
making in school or after school – it is expected that this is something an individual can and will do by himself at some point during the education process (Arnett, 2004). Nevertheless, the focus on the “decision” aspect of career development seems overly narrow given that a single decision is a relatively simple mental act, while what career counselors and educators are truly concerned with is development, success and well-being over a lifetime – which requires much more than a decision.

In keeping with the assumption that career indecision is a problem, Feldman (2003) has defined early career indecision as “the inability to formulate initial career goals and experience commitment to initial vocational choices,” (p. 500) – note the emphasis on inability as a developmentally inappropriate outcome. He argues that early career indecision can negatively affect individuals’ lives in several ways. First, an individual may put off making career decisions too long, and by procrastinating, miss out on opportunities or otherwise squander time in ways that impact her long-term life outcomes. For example, as career duration is positively correlated with wages, launching a career “late” can result in lower earnings than if an individual begins his career as soon as possible. Second, an individual experiencing career indecision may make a poorly considered choice, resulting in dissatisfaction that reduces productivity, increases job changes, and wastes time and resources. Finally, these two factors may interact and even compound one another, such as when career indecision leads to procrastination, which reduces opportunities in one career domain and causes an individual to take a position that is not a good fit for her.

There is also empirical evidence for the association between career indecision and negative affect or outcomes. In Jones’s (1989) seminal study, 221 undergraduates reported their level of career decidedness and comfort with their decision. Jones classified his sample as 42.5% decided-comfortable, 20.8% decided-uncomfortable, 7.7% undecided-comfortable and 29.0% undecided-uncomfortable. Reasons that students reported for their indecision included inadequate self-understanding, poor understanding of training and work realities, and less motivation towards making a career decision. Students who were uncomfortable about their career decision status were similarly
suffering from low self- and work-related understanding, and were hampered by general indecision, anxiety, and less security about their identities.

More recently, Rottinghaus, Jenkins & Jantzer (2009) investigated the relationship between negative affectivity and career decision status in college students. In their sample of 388 undergraduates (62% women, 67% white) in psychology and sociology courses at a large Midwestern university, those who had made a career decision were significantly less depressed than those who reported not having made a career decision. The study used the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), a standard measure of depressive systems in the last week. The CES-D includes items on both subjective (affective) well-being (e.g., “I feel sad,”) and psychological (objective, observable) well-being (e.g. “My sleep was restless,”).

Hammond, Lockman & Boling (2010) have shown that there is also a relationship between negative affectivity and career indecision in a sample of African American college students. They surveyed 171 African American students (75.3% female) about their positive and negative affectivity (using the PANAS), level of career decidedness and decisiveness (using the Career Decision Profile), goal stability, and sense of vocational identity. A factor analysis of these scales revealed that negative affectivity was related to a weaker sense of vocational identity, goal instability and general indecisiveness. The authors termed this factor vocational identity development.

A major issue with the work discussed above is that it cannot reveal the nature of the relationship between career indecision and negative outcomes. While it is plausible that career indecision causes negative outcomes, it is also possible that negative states cause career indecision (depression, for example, is known to hamper decision-making), or that another variable causes both career indecision and negative affect. As in any model of human experience, it is certain that multiple other variables contribute to both initial and consequential states. While much of the literature assumes that career indecision is bad in itself, and further argues that career indecision causes negative outcomes, the next section will introduce an alternative idea that challenges the
construction of career indecision as inherently harmful and widens the scope of the investigation to consider other potential contributors to negative affect and outcomes related to career.

A second problem with using career decidedness as an explanation for why some young adults experience stress and negative affectivity is that the hypothesis does not account for many cases. In Jones’s (1989) study, 20.8% of the sample said they were decided about their careers, yet reported distress nonetheless; another 7.7% were relatively undecided, but reported little distress. In a more recent study of 278 adults who sought the services of the career center at an American Midwestern university, Multon, Wood, Heppner and Gysbers (2007) used cluster analysis on questionnaire data to describe four distinct types of clients. These types can be described using four general dimensions: career decidedness, comfort with their career decision status, general mental health, and primary need for career counseling. Table 1.1 summarizes these clusters; the most interesting in the context of this argument is Cluster 3, which was characterized by moderate career decidedness, yet discomfort with career decision status and general psychological distress. The combination of decidedness with discomfort and distress was seen in 17.6% of their sample – similar to the proportion found by Jones.

<table>
<thead>
<tr>
<th>Cluster (n)</th>
<th>Career Deciderness</th>
<th>Comfort with Decision Status</th>
<th>General Mental Health</th>
<th>Primary Counseling Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (n = 90)</td>
<td>Undecided</td>
<td>Uncomfortable</td>
<td>Healthy</td>
<td>Information</td>
</tr>
<tr>
<td>2 (n = 45)</td>
<td>Decided</td>
<td>Comfortable</td>
<td>Healthy</td>
<td>Guidance</td>
</tr>
<tr>
<td>3 (n = 49)</td>
<td>Moderately decided</td>
<td>Uncomfortable</td>
<td>Distressed</td>
<td>Interest</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Clarification</td>
</tr>
<tr>
<td>4 (n = 94)</td>
<td>Undecided</td>
<td>Uncomfortable</td>
<td>Distressed</td>
<td>Information</td>
</tr>
</tbody>
</table>

In much of the extant research, the construct of career decidedness seems to act as a binary rather than continuous variable. One can conceivably be completely decided or
undecided, but in real life, it is often somewhere in between. Part of the ambiguity hinges on the fact that when emerging adults talk about their professional lives, they are typically trying to predict their own future behavior. Given that no one can predict the future with perfect accuracy, saying that you have made a career decision is actually a much weaker statement, such as, “I believe with greater than 50% certainty that I will most likely enter a particular occupation or profession in the near future.” In some cases, saying that you are career decided also means something like, “I am mostly happy with the decision that I have made.” It does not, however, typically mean, “I can say with 100% certainty that I will enter a certain occupation and I am completely happy and satisfied with that decision.”

Likewise, the range of meaning contained in the label “career undecided” is vast. A young adult could mean, “I mostly know what I want to do, but I am not sure whether I can successfully enter into the profession.” Or, “My parents want me to be X, but I want to be Y or Z, and I haven’t yet figured out how to solve this problem.” Very few emerging adults truly mean, “I have no idea what I want in life, what I am good at, what I want to do, or where I am going,” though some do feel this way. To capture both the range of experiences that young people have when they have not yet entered the working world, and to acknowledge the fact that even those who have made a decision may experience worry or fear, in this discussion, I want to move away from career decision or indecision, and instead talk about “career uncertainty” – a challenge that most young people face to some degree, and which can be met with productive behaviors rather than stress, anxiety and other negative outcomes.

The most important problem with research on career decidedness is that it is an inappropriate goal for the real world. As we know, young adults today will face many career transitions, caused by their own interest in having multiple occupations, the growing trends for companies to hire workers for shorter periods of time, and our increasing life spans. Making one career decision early in life is simply impractical. So, for career counselors or higher education administrators to make career decidedness their goal does not serve the needs of the students. As Stokes and Wyn (2007) concluded from
their research on hundreds of Australian high school graduates, after tracking them for sixteen years, “Young people are, of necessity, required to take a flexible and pragmatic approach to the decisions they make at this time of their lives, forging diverse pathways towards relatively similar goals (job security, balance in life and fulfillment in everyday practices),” (p. 502). According to their analysis, young people who are able to keep career and personal options open, and to juggle different kinds of roles and responsibilities, are more likely to be successful during emerging adulthood. In the next chapter, I will consider the nature and components of a new construct that describes this ability to be personally and professionally flexible: Career Development Agency.
CHAPTER 2. AGENCY AND CAREER DEVELOPMENT

A SOCIAL COGNITIVE THEORY OF AGENCY

“If you want to make God laugh, tell him your plans.” - Woody Allen

As argued in Chapter 1, a fundamental assumption of the literature on career development is that early career indecision is undesirable. Therefore, much of the work in the area has focused on increasing career decision-making ability or reducing career indecision in other ways (Uffleman, 2004; Stringer, 2007; Savickas, 1995*). Yet while most of the work has been done on emerging adults, few authors have acknowledged the special situation and needs of people in this life stage. In fact, emerging adults transitioning from school to work must make not one, but many career-related decisions, such as what field to study, what extracurricular and vocational opportunities to pursue, where to live, and how to approach the search for employment. Furthermore, we know that young people today will have a number of jobs and several careers in their lifetime, making the idea of a single decision obsolete (Krumboltz, 2009). An emerging adulthood perspective on career development means that instead of viewing indecision as a problem to be fixed, career decision-making during this time is a process that includes indecision naturally. Therefore, the goal of this chapter is to re-focus the discussion on how young people can engage in a healthy, productive process of career development rather than decision, and to suggest agency as a variable that affects how emerging adults deal with the school-to-work transition and the related—and necessary—career uncertainty.

Agency is the foundational assumption of this dissertation: human beings can actively and effectively work to make changes in their thoughts, goals, careers and lives. While this tenet may seem obvious, materialistic and psychological reductionists have raised the question of whether people do, in fact, motivate their own thoughts and behaviors, or if our actions arise out of forces external and unknown to us, such as laws of physics or details of our neuroanatomy. In his seminal discussion of human agency, Bandura (1989) gives the question a Kantian turn by asking, in effect, “How is it possible that people have free will and are able to effect change, both within themselves and in the
world?” Instead of questioning what we perceive as true – our own agency – Bandura investigates the mechanisms that explain how we develop and express agency. In his view, agency is “The capacity to exercise control over one’s own thought processes, motivation, and action,” through which “people can effect change in themselves and their situations through their own efforts,” (p. 1175).

Of course, there are other causal factors in human motivation and action; we are never completely autonomous or spontaneous. According to Bandura’s social cognitive theory, individual characteristics, behavior, and social-environmental events all interact to give rise to further thought and action, in a process called triadic reciprocal causality. Instead of seeing the person and her environment as independent, we should look at how individual thought and behavior influences external events, which in turn shape thought and behavior, in a continuous feedback cycle. For example, consider the action of going to visit your elderly grandmother. A materialistic determinism explanation of this behavior would focus on physical laws and interactions, possibly at the level of neurobiology. A psychological reductionist account of the event would highlight triggering stimuli, such as a call from her retirement home, and psychological rewards, such as the delight on Grandma’s face when you arrive. A basic agent-centered perspective could postulate that you went because you chose to, but this is unsatisfying and uninformative. Social cognitive theory allows us to talk about motivations, such as desire to see your relative, and mental characteristics, such as belief in your ability to entertain and help her, as causal contributors to your action. It also acknowledges that social norms, such as cultural emphasis on caring for the elderly, may influence you, as could the external event of the retirement home calling to remind you about your visit.

Agency in career development is associated with measurable positive outcomes. In a study of recent, male college graduates in Germany (N = 83), Oettingen and Mayer (2002) reported that there was a strong positive correlation between high expectations of success and actual number of job offers, and actual salary offers. Positive, but realistic outcome expectations are an important theoretical mechanism of agency. People who expect their efforts will be successful are, in fact, more successful. A very interesting part
of this study was that the researchers also measured participants’ frequency of fantasizing about their transition to work, such as by imagining getting a job very easily, or picturing employment that is effortless yet highly compensated. Fantasizing—which differs from actual outcome expectations—was significantly negatively correlated with job offers and salaries. This raises an important point, mentioned above, about agency: positive thinking or positive self-talk is not sufficient. The kind of agency that results in success involves legitimate outcome expectations, in which an individual has judged that a positive future is actually likely, rather than merely desired.

More broadly, agency is related to multiple positive outcomes in emerging adulthood. For example, Lamborn and Groh (2009) surveyed 285 American undergraduate college students (mostly white and female), and found that self-reliance, a proximal measure of agency, was negatively correlated with psychological and somatic symptoms of ill health. Self-reliance was positively correlated, however, with self-reported college grades and positive attitudes towards school (e.g., “I felt satisfied with college because I am learning a lot.”).

Unsurprisingly, reduced agency has many potential negative effects. Hackett and Betz (1981) and Betz (2006) have applied agency theory to explain why women may experience internal and exterior barriers to career development, such as the choice of “feminine” occupations, or the “glass ceiling”, which prevents women from attaining career success to the same extent as men. In an intervention designed to increase career related self-efficacy (a sub-factor of agency) for career undecided women, Sullivan and Mahalik (2000) found that the 31 women who participated in a six-week treatment specifically designed to increase career decision-making self-efficacy reported higher clarity and confidence related to making and committing to career choices. This improvement was not seen in a control group of 30 women who were also career undecided; differences between the groups were maintained even six weeks later. A major component of agency, self-efficacy, can affect confidence and future plans regarding career choice.
Self-Efficacy in Career Domains

Bandura discusses three ways in which agency is exercised: self-efficacy beliefs, goal representations, and anticipated outcomes. Beliefs about one’s own ability to exert control and have impact on one’s own life outcomes – which reflect self-efficacy – are, according to the theory, the most important contributor to agency and its related cognitive, motivational, affective and selection processes. In other words, people who believe that they can achieve a certain goal will be more likely to have self-supportive thoughts, be more motivated, feel positive and hopeful, and choose people and situations that encourage goal achievement. Self-beliefs inform our formulation and selection of goals, which in turn motivate behavior: psychologically healthy individuals do not set goals that they believe are impossible. Self-beliefs also shape our mental formulations of the outcomes of our actions, which allow us to adjust our actions to achieve desired consequences. When we have high self-efficacy, we envision positive outcomes and try harder; with low self-efficacy, we predict failure and may give up prematurely.

Self-efficacy beliefs are domain-specific, and have four main sources: mastery experiences, vicarious learning experiences, social support, and physiological and emotional states. To truly believe in yourself, you need reasons and evidence, such as prior performance, the confidence of people you trust, and feedback from your own mind and body that indicates high probability of success. A rock-climber, facing a risky cliff, will only exercise his agency – choose to climb the cliff – if he believes that he can succeed. False or empty bravado will not convince him; he needs to have completed other challenging routes and see that others of his skill level have done it. If his instructor encourages him, he may have greater confidence in himself; less so if it is his sedentary friend egging him on. Starting the climb, a smart athlete will listen to the feedback from his mind and body: fear and muscle fatigue may indicate he has taken on too great a challenge. Importantly, simply repeating a mantra such as “I can do this,” is not sufficient for genuine self-efficacy; self-talk alone cannot drive human action.

In regards to career development specifically, much of the extant work on agency has centered on a narrow domain of career behavior: Career Decision-Making Self-
Efficacy (CDMSE; Betz & Hackett, 1981). The CDMSE construct is part of Social Cognitive Career Theory (Lent, Brown and Hackett, 1994), and refers to an individual’s beliefs about his or her capacity to make career decisions, including abilities to self-appraise, learn about occupations, select goals, make plans, and solve career decision problems (Betz & Luzzo, 1996). The theory has generated hundreds of empirical studies on its antecedents, correlates, influences and outcomes. Though it is impossible to review all of the findings here, Gainor’s (2006) review of twenty-five years of research on career decision-making self-efficacy concluded that a variety of interventions have been highly effective across many groups of students and career counseling clients.

In a representative study, Scott & Ciani (2008) tested whether a course explicitly designed to enhance the four sources of self-efficacy would increase career decision-making self-efficacy in undergraduates. The course engaged students in a wide range of career development activities, including using the resources of the university’s career center (mastery experiences), listening to professionals on a career panel talk about their experiences (vicarious learning), having discussions with instructors and classmates (social support) and learning about anxiety management (physiological/emotional states). Using a pre- and post-course assessment of CDMSE, Scott & Ciani found that the 88 participants had higher self-efficacy at the end of the course, and that women in particular felt more efficacious in the career planning and problem-solving. While these results are interesting, many such studies of CDMSE are limited by the narrow theoretical focus and lack of control or comparison groups, and practical interpretations of their findings are difficult given the amount and diversity of approaches used in the interventions.

Dysfunctional Beliefs about Career Decision-Making

Another strand of research that relates agency to career development has examined the role of non-self-related beliefs, such as those related to personal goals and anticipated outcomes. These beliefs are distinct from self-efficacy beliefs because they do not regard the individual him- or her-self; one can be perfectly confident, yet have reduced agency (motivation, productive behavior) because goals are inappropriate, or lack clarity, or because the anticipated outcome is negative. The goals we choose for
ourselves are also a psychological mechanism that enables agency (purposive action). By using our capacity to imagine the future, we can motivate – or demotivate – ourselves to act today. For example, a member of an ethnic minority may choose not to apply for a job due to expectations of racial discrimination rather than low self-efficacy. Naturally, erroneous or maladaptive career-related beliefs have been identified and investigated as potential contributors to indecision and unhappiness. For example, the Career Beliefs Inventory (Krumboltz, 1994), Career Thoughts Inventory (CTI; Sampson, Peterson, Lenz, Reardon, & Saunders, 1998, 1999) and Career Decision Difficulties Questionnaire (CDDQ; Krausz & Osipow, 1996) all assess various unhelpful ideas individuals may have about their career and the decision-making and development process. Though they are all widely used and extremely useful for counseling, none of these measures, however, was specifically designed for the unique situations of modern emerging adults beginning the school-to-work transition.

A certain group of career-related beliefs, however, are particularly relevant and problematic for emerging adults. Specifically, their beliefs about life stages may impact how they feel about, and handle, their own career development. For example, many people in their late teens and twenties may not have heard of “emerging adulthood” as a distinct part of modern life at all. Operating under a more traditional definition of adulthood, in which they feel the expectation to marry, choose a career, have children and settle down, they may feel that by not having already chosen their life’s occupation, they are “behind” or otherwise deficient. This dysfunctional belief about career decision-making and commitment, rather than the state of uncertainty itself, may cause anxiety and other forms of affective distress. In an in-depth interview study of 15 people ages 18-25, who suffered from major and minor depression, Kuwabara, Van Voorhees, Gollman and Alexander (2007) found that “a sense of failure to achieve expected developmental milestones” was related to and interacted with depression.

The expectations of society and older adults, as conveyed through media and other cultural institutions, may contribute to emerging adults’ confusion regarding career (Hoffner, Levine & Toohey, 2008). The cover of the New Yorker magazine for May 24,
2010 depicts a young man hanging his Ph.D. diploma on the wall of his childhood room, while his parents look on with dismay. This illustration conveys older adults’ consternation about adult children who have moved back in with their parents after school, or who may be living on their own but otherwise failing to launch successful careers and lives. As Barreca (2010) writes, the message of the cartoon is that young adults who do not establish their own careers and households are “kids, no matter what their age, and want to go home to Ma and Pa.” While financial and social independence are certainly desirable goals, condemning those who do not achieve it immediately is out of touch with the reality, in many times and cultures, that living with one’s parents and family can be a normal and useful step towards that eventual outcome.

In addition to communicating norms about when to make “adult” commitments such as entering a long-term career path, social and cultural institutions as well as media also propagate a plethora of other career-related myths. Brooks (2011) notes that many recent college commencement addresses encourage exceptional self-centeredness: “follow your passion, chart your own course, marched to the beat of your own drummer, follow your dreams and find your self,” (original italics). Brooks criticizes this mantra as misleading; instead of the passion coming first, he argues that passion grows out of actively living and responding to a real problem. For example, many young people today have been galvanized by the environmental movement, and are pursuing careers in green energy, sustainable agriculture, and environmentally friendly business. These passions were not coded in their DNA, nor were they likely to be childhood dreams; instead, they are young people’s intelligent, compassionate responses to the problems they see in the world. Telling an 18-year-old to find his passion before he has even started living an adult life is unhelpful, and maybe even harmful.

The philosopher Paul Benson (1991) argues that society can reduce individual agency by strongly influencing people to internalize ideas that are untrue. For example, women may believe that they ought to be thin and beautiful due to social media influences. A woman who becomes anorexic due to these influences has lost agency through no fault of her own. As Benson writes, “…if [her] upbringing reliably led her
gravely to misunderstand the place of feminine appearance in her value as a person, and systematically prevented her from correcting that misunderstanding, then surely the motives and judgments that occasion her persistent dissatisfaction with herself are less than fully her own,” (p. 390). When cultural teachings are both erroneous and so common as to be almost inescapable, they reduce individual autonomy.

HAPPENSTANCE LEARNING THEORY

The biggest limitation of existing theory and research relating self-efficacy and dysfunctional beliefs to the career domain is that the focus on decision-making is simply too narrow. As I have argued above, career decision-making is not ecologically valid for the context of today’s emerging adults; it is not the only or even the first thing that young people need help with. A plan for what to do after school is one part of the equation. But so is confidence in one’s ability to cope with change once one’s career begins, skills in gathering relevant information about work, recognition that uncertainty is natural, and clarity regarding personal values and life goals. These broad attitudes and abilities go far beyond decision-making.

Therefore, the concern driving the proposed research is not, “How do people decide on an occupation?” or even, “How do we help people make career decisions?” but rather, “How can we understand and ameliorate negative outcomes related to career uncertainty in emerging adulthood?” While most of the work on career choice and development has examined only the first two questions, the discussion above identifies agency as a key concept needing a more expansive definition in the career development field.

I would like to take a broad view of Career Development Agency (CDA), which encompasses not only the initial school-to-work decision-making, but also dealing with uncertainty, change, and multiple decision points across a lifetime. This perspective is based on Happenstance Learning Theory (HLT; Krumboltz, 2009). Krumboltz argues that the influences on an individual’s life outcomes are so vast, and so unpredictable, that it is almost ridiculous to try to make a single decision early in life about the rest of one’s
career. Chance, or happenstance, plays a large role in career development, and we can either acknowledge or fight it. If we acknowledge it, according to Krumboltz, we better prepare ourselves to maximize and take advantage of serendipitous opportunities that arise. One way to do this is to engage in exploratory activities that do not have a single career goal, but rather aim to expand career and personal options in multiple ways. While any list of behaviors that qualify as career development cannot be exhaustive, and will differ by individual, HLT advises multiple strategies, as summarized in Table 2.1. Embedded within these principles is an orientation towards self-reflection and understanding, combined with an open-minded and realistic, but positive outlook on the world. Other overarching themes from HLT are an encouragement to try things out and be active in the world, and along with that, an acceptance that this hands-on approach will involve risk and even failure.
Table 2.1. Career development guidelines from Happenstance Learning Theory

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Selected Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make the most of unplanned events</td>
<td>Reflect on how previous unplanned events have resulted in positive outcomes; keep a journal</td>
</tr>
<tr>
<td>Always keep your options open</td>
<td>Consider giving up the practice of naming a single, rigid career goal; research multiple careers</td>
</tr>
<tr>
<td>Wake up -- before your dream comes true</td>
<td>Approach “dream jobs” in small steps rather than huge leaps; reassess them as necessary</td>
</tr>
<tr>
<td>Try it -- even without knowing the outcome</td>
<td>Try new things, be imaginative, and gather social support for risky endeavors</td>
</tr>
<tr>
<td>Go ahead and make mistakes</td>
<td>Accept mistakes as inevitable, positive learning opportunities; understand role of chance in mistakes</td>
</tr>
<tr>
<td>Take action to create your own luck</td>
<td>Always do your best work; ask for help; persist despite rejection; network actively</td>
</tr>
<tr>
<td>Go for the job -- then learn the skills</td>
<td>Always continue learning; build self-confidence and skills through each experience</td>
</tr>
<tr>
<td>Enjoy yourself -- the good life is a balanced life</td>
<td>Have hobbies, get involved in your community, volunteer, help others, go back to school</td>
</tr>
<tr>
<td>Overcome self-sabotage</td>
<td>Work on reducing harmful beliefs such as the need for perfection, self-doubt, or entitlement</td>
</tr>
</tbody>
</table>

HLT is well-suited to the needs of emerging adults because it de-emphasizes the need to make a single, final decision and highlights the importance of career development to living a fulfilling, flourishing life. As Krumboltz (2009) writes, “The goal of career counseling is to help clients learn to take actions to achieve more satisfying career and personal lives—not to make a single career decision,” (p. 141). He reasons that making an irreversible, one-time career decision depends on predicting the future, which is impossible. For example, some careers that exist now may be obsolete in twenty years, and at the same time, new, currently unimaginable careers will require workers to leave a predefined occupation and adapt to new needs. While a young person may make a
commitment to a given job, the job in turn makes no such commitment, and those who overcommit may be lost in the new economy – as telephone switchboard operators from the first half of the 20th century found themselves retraining for new positions well before the 21st.

In the next chapter, I will describe an innovative intervention that aims to improve career development agency, rather than career decision-making alone. The intervention has never been used in the career development field, and is grounded in the problem-solving approach of engineering. The idea to use this methodology, called “design thinking”, in the context of career development, came from collaboration between Bill Burnett, Executive Director of the Design Program at Stanford University, and Dave Evans, who was then teaching a course called “How To Find Your Vocation” at UC Berkeley. In 2007, they began teaching courses for students in the design program at Stanford. In subsequent years, Sheri Sheppard, a professor of Mechanical Engineering, joined the teaching team and they expanded course offerings to doctoral students from any department, as well as undergraduate juniors and seniors. According to the course instructors (Evans, 2011), they aim to “teach students how to apply the innovative methodology and principles of design thinking to the wicked problem of designing their lives after college.” To understand how this intervention may affect the career development of emerging adults, I will situate it within a conceptual framework that relates career uncertainty and career development agency to the outcome of interest, well-being in emerging adulthood. Chapter 3 presents this framework and provides a theoretical link between the psychological model of career development agency and the unique approach of the intervention.
CHAPTER 3. CONCEPTUAL FRAMEWORK

OVERVIEW

In this chapter, I present a conceptual framework for studying the relationship between career decision status in emerging adulthood, career development agency, and subjective and psychological well-being. To understand this model, it is useful to start with a simpler theory, which was described in Chapter 1 – a direct relationship between career decision status and well-being (Figure 3.1). According to previous work on career decision-making, career indecision was a source of negative outcomes while having a career decision was positive and desirable.

![Figure 3.1](image)

*Figure 3.1. Simple model of the relationship between career decision status and well-being in emerging adulthood.*

In my alternative framework (Figure 3.2), I add career development agency and highlight the roles of three agency mechanisms: context, self-efficacy and beliefs. I also change “Career decision status” to “Career clarity”, in order to emphasize the non-dichotomous nature of the construct and to remove the normative implication that a career decision is necessarily good.

According to the model, career clarity is neither the only potential source of well-being, nor is lack of clarity (career uncertainty) necessarily harmful. The dashed line between career clarity and well-being indicates that this relationship is predicted by the previous literature (i.e. Figure 2.1) but is neither logically implied nor denied by the new...
theory. Instead, agency is directly related to well-being in a given domain, and career clarity moderates their relationship. Specifically, low agency is a risk factor for reduced well-being, and career uncertainty adds to this effect, making it potentially worse. Agency can be reduced in many ways, but in the model I focus on high levels of contextual stress, low self-efficacy, or dysfunctional beliefs. In contrast, emerging adults who have relatively low stress, high self-efficacy, and adaptive beliefs – the conditions for high agency – are hypothesized to be more resilient to career uncertainty and can respond in a psychologically healthy manner. For individuals with high career development agency, career uncertainty does not pose an additional risk. As my particular concern is for those students who are at risk for reduced well-being, however, I present a negatively valenced model in Figure 3.3.

*Figure 3.2. Neutral model of the relationships among Career Development Agency, Career Clarity and Well-Being*
Figure 3.3. Risk model of the relationships between career development agency, career clarity and well-being

The intervention portion of the study proposes that enhancing self-efficacy and reducing dysfunctional beliefs increases agency and its related positive outcomes. Figure 3.4 illustrates the mechanisms by which the intervention is theorized to enhance career development agency. The final part of the chapter describes the intervention in detail, with specific reference to sources of self-efficacy, and the theoretical relationship between the pedagogical foundation of the intervention, design thinking, and dysfunctional beliefs. In the next section, I describe each of the constructs in the model individually.
Figure 3.4. Model of how components of intervention enhance career development self-efficacy and beliefs

CAREER DEVELOPMENT AGENCY

Agency is a construct with both general and domain-specific meaning. In general, agency refers to individuals’ ability to “effect change in themselves and their situations through their own efforts,” (Bandura, 1989, p. 1175) and is dependent on many psychological factors, including thought, personal and vicarious experiences, self-reflection and self-regulation. While global personal agency is useful to speak of in some circumstances, agency can also be considered at multiple levels, including within specific domains. For the purpose of this research, we define agency in reference specifically to career development.

Career development agency is a new construct in the literature on professional choice and behavior, and is distinct from the most popular topic in the field, career decision-making self-efficacy (see Chapter 1). While career decision-making focuses on the single mental act of choosing an occupation at a given moment, career development looks more broadly at both thought and action related to not only choosing a job, but also discovering talents and interests, improving employment eligibility, and other processes that individuals engage in over time in order to have productive, fulfilling work lives. Career development involves multiple decisions over an extended period of time and ongoing learning about the self and the world. Agency in this domain is, roughly, the
capacity and motivation to engage in behaviors that produce work-related knowledge, experience and opportunities. Many actions, both mental and physical, can demonstrate career development agency, from introspective practices such as writing in a journal to clarify vocational interests, to traditional activities such as gathering occupational information, meeting with professional mentors, and attending networking events.

**Career Development Self-Efficacy**

At both the global and domain-specific levels, agency has multiple concurrent sources. According to Bandura (1982), self-efficacy is the most important mechanism of agency regardless of the domain. Stated somewhat tautologically, career development self-efficacy is belief in one’s own capacity to successfully perform career development behaviors (based on Betz, 2004, and Betz, Klein & Taylor, 1996). Self-efficacy beliefs have both a semantic component (e.g. the conscious thought, “I have the ability to find information about careers I’m interested in”) and an affective component (e.g. a non-verbalized feeling of confidence that I can actually carry out this action).

Career development self-efficacy is conceptualized here as self-confident, positive beliefs about one’s own abilities in fundamental areas of career-related skills: gaining occupational information, understanding one’s vocational interests and talents, selecting work-related goals, career planning, and employment-related problem-solving. Each of these sub-domains is considered critical, but not sufficient or exhaustive. Self-efficacy is continuous, not dichotomous, with contributing and limiting factors as diverse as individuals and their life-work contexts.

Just as self-efficacy must be defined in the specific domain of career development, so must the sources of self-efficacy be described for that domain. The primary sources of self-efficacy, as described by Bandura, are mastery experiences, social support, vicarious experiences, and physiological/emotional states. Mastery experiences allow individuals to build confidence in their capacities by demonstrating to themselves that they can, in fact, successfully act in that area. Literature on career counseling indicates that mastery experiences available to college students in the domain of career
development are diverse. They include activities with clear, positive outcomes such as practicing networking and interviewing techniques, writing cover letters and resumes, and doing volunteer work and internships vocational fields of interest.

Social support and vicarious experiences also offer many sources of self-efficacy. Friends, family, and colleagues, as well as senior individuals such as teachers, counselors, and managers can provide social support. Self-efficacy theory holds that the social nature of human beings means that we gain feelings of confidence and are more comfortable taking risks when we have a social safety net to fall back upon. Furthermore, the beliefs of others influence our own beliefs strongly, so that if people around us believe in our abilities, we are more likely to believe in ourselves as well, and act on these beliefs. Like social support, vicarious experiences enhance self-efficacy through others. If others known to an individual are successful, and the individual perceives him or herself as relevantly similar, his or her own self-efficacy may be increased. In the career development domain, this means that peers can act as positive role models, as well as successful older adults who can act as advisers, mentors and examples of productive professional pathways.

Self-efficacy is also responsive to physiological and emotional states. Though self-efficacy is not considered a mood, and is relatively stable over time in the absence of change agents, at any given time it may fluctuate in response to internal and external contexts. As the individual is always seen as embedded within and responsive to the world, situations that are stressful, tiring, or saddening may depress self-efficacy at that moment, while chronically negative environments may take a toll on self-efficacy over the long-term. In contrast, positive events and moods may temporarily increase self-efficacy, and these gains may linger if the positive state or emotion is sustained. In the career development domain, personal, familial and institutional expectations for emerging adults to make and publicly adhere to socially acceptable career decisions may constitute, for some, a persistently negative emotional atmosphere that depresses self-efficacy. Conversely, having an optimistic outlook and experiencing many academic and personal successes during young adulthood may boost feelings of confidence in career
development. Naturally, the sources of physiological and emotional states are both myriad and particular to the individual; nevertheless, certain common patterns can be seen in causes of negative and positive states. Furthermore, there are numerous techniques, skills and habits known to enhance individual health and mood.

Dysfunctional Beliefs

While self-efficacy refers to beliefs about one’s own capabilities, non-self related beliefs are also relevant as mechanisms of agency. Bandura (1989) identifies goals and anticipated outcomes as psychological constructs through which human beings intentionally motivate their own thoughts and behaviors. Individual goals can be understood as beliefs about what one ought to pursue, with a conscious, cognitive understanding of the objective, combined with an authentic desire to achieve the objective. Outcome expectations are a type of belief that forecast consequences of an individual’s own potential actions, in his or her own opinion, based on knowledge and cognitive models of the world and its workings. While conceptually distinct, goals and anticipated outcomes have a natural relationship. People have the intellectual ability to imagine what would happen as a result of any random behavior, but most only care to anticipate outcomes of potential behaviors that arise from an actual goal.

If I have a goal, for example, to hit a winner during a tennis match, and a particular belief, such as that hitting to the left corner will indeed win the point, I may form an intention to act, and begin aiming for the left corner. Upon simulating the action in my mind, however, I may come to expect that my opponent will successfully counter the attack. This may be due to lack of confidence on my part, previous experience of defenses against this strategy, or an accurate appraisal of my opponent’s ability. In this example, my goal of winning the match and my anticipated outcome of hitting a particular shot combine to motivate my actual behavior – selecting a different shot than the original proposed “winner”. Therefore, a combination of self-efficacy, goals and outcome expectations can explain a great deal of how I exercise agency when playing tennis.
In the domain of career development agency, many non-self beliefs are relevant to individual goals and anticipated outcomes related to career. As noted in Chapter 1, beliefs regarding the desirability of early career decision may inform dysfunctional goals, such as the desire to have decided upon lifelong career at the age of 18. Likewise, beliefs about the way careers work may lead to anticipated outcomes that are inaccurate and maladaptive. An emerging adult who has not yet held a full-time position, or who has limited knowledge of the working world, may think that his first job should be the fulfillment of his childhood dream, and the beginning of a lifelong passion. Or, he may worry that making a mistake in career decision early on will limit his choices later in life, and even result in professional ruin.

Social and economic context may also influence beliefs about career development and operate independently of other mechanisms of agency, such as self-efficacy. For example, a graduating college student may have a goal of successfully interviewing for a job and getting a job offer. She may also believe that she is qualified for the job and capable of giving an excellent interview – possessing high self-efficacy. If she also believes, however, that a global recession is depressing hiring across the board, she may have a very pessimistic outcome expectation.

A complete discussion of the meaning of the term “belief” and an exhaustive exploration of the types of beliefs that influence career development is beyond the scope of this dissertation. In the following discussions, I will assume that beliefs are consciously held propositions that have both a cognitive and an affective component, and which guide human behavior (Dennett, 1981). For example, to say that I believe the proposition, “It is sunny and warm outside right now,” means that I can both state this belief explicitly, and that I desire to dress appropriately for sunny, warm weather. Without that affective motivation to respond appropriately, superficial agreement with a simple statement is not an authentic belief. Furthermore, for the purposes of this research, I will limit my discussion of beliefs to those goals and anticipated outcomes that are most problematic for agentic, healthy career development. Specifically, I will focus on dysfunctional beliefs regarding the desirability of early career decisions (goals), the
negative consequences of early career indecision, and pessimistic assessments of the current employment outlook (anticipated outcomes).

**Contextual Stressors**

This research relies on a sociocultural perspective that views the individual as embedded within, and continuously interacting with, his or her environment, context, or situation. According to this theoretical lens, individual variables should be evaluated in light of relevant personal, cultural, historical and other factors. For example, chronological age may seem like a prototypical individual variable; however, the meaning of being twelve years old in an American Indian tribe, 200 years ago, is likely quite different from the meaning of the very same chronological age in the United States today. More generally, many important life changes are socially defined and operate on timelines determined by social institutions, not individuals: obtaining a college degree, for example, is a culturally recognized achievement that is increasingly becoming a prerequisite for more prestigious and financially rewarding employment. Individual context is included in the model in order to emphasize that career decision-making is only a factor in well-being when it is a relevant issue for that person in his or her life, culture, society and historical period.

In contemporary American culture, career-related questions are highly relevant at a few key turning points: entering the work world, changing jobs or careers, and retirement are probably the biggest and most universal. As this research is limited in scope to emerging adulthood, however, career entry is the main focus. This work does not seek to explore career questions for, say, four-year-olds, for whom the question of professional future has different implications. It is also probably unfruitful to treat mid-life transitions as equivalent to the radical changes of early adulthood.

While research on emerging adulthood has demonstrated its applicability to a wide range of people from different socio-cultural backgrounds, it is also true that each individual lives within a unique constellation of personal factors that make his or her experience more or less challenging. For example, one young woman may go through
higher education with minimal stress, because she has wanted to take the helm of the family business from an early age, and knows that studying business administration will help her achieve that dream. On the other hand, many young people experience so much anxiety about their professional futures that they need help from career counselors and clinical psychologists. As Arnett and Brody (2008) have observed, the consequence of so much freedom (career-related and otherwise) in emerging adulthood is ambiguity, uncertainty and instability – what they term “a fraught passage”. A sociocultural approach posits that psychological resilience and other internal factors are not enough to predict how people will handle the issues of emerging adulthood. The presence or absence of other contextual factors will strongly influence each individual’s outcome.

In the literature on this life stage, and the pilot and observational work preceding this research, several factors have emerged as potential stressors that influence how young adults approach their careers. First, young people who are reaching the end of their planned educational path must prepare to confront an entirely new world – the (so-called) “real” world. The imminence of graduation is the stressor that college juniors and seniors most frequently report in the pilot study described in Chapter 4. Second, emerging adults frequently feel that they need to satisfy others through their careers, and many feel a moral obligation to become financially independent or even financially support their parents and families (Fuligni and Pedersen, 2002). Third, larger influences such as social expectations and the current economic climate may have an impact on emerging adults’ outlooks on their future employment (Tanner & Yabiku, 1999). While it is not possible to identify every contributing factor that affects how emerging adults manage their entry into the working world, the research seeks to identify some key features of individual contexts associated with reduced career development agency.

**Career Uncertainty**

As noted in the previous section, the construct of career uncertainty is limited in this model to refer only to emerging adults, approximately 18 to 30 years old, living in the modern, developed world. Even within the given age group, however, the term career uncertainty must be clarified, and distinguished from career decidedness— the construct
more typically used in the career development literature. Career decidedness implies a binary division -- decided or undecided -- that can obscure nuances created by individual differences and changes over time. As noted previously, it is rare (and unrealistic!) for individuals who have not yet entered the working world to have a stable and perfect feeling of certainty regarding their future career path. It is also uncommon for people to reach the age of 18 with absolutely no idea of what they want to do in the future.

In this research, I tried to conceptualize career uncertainty with more ecological validity, by treating it as a continuous variable. In Jones’s (1989) work, there are two aspects of career uncertainty that are combined and weighted equally as parts of a holistic measure. The first component is level of commitment to a general professional field, such as healthcare or business; the second refers to strength of genuine intention to fulfill a specific occupational role, such as dietitian or market analyst. Though in many cases the occupational field choice comes first, and is closely related to the anticipated job title, the two components are conceptually distinct. It is possible, for example, for an individual to strongly desire a particular occupational role while being uncertain about his or her field (e.g., a public relations specialist deciding between for-profit or non-profit institutions).

To summarize, career uncertainty is an individual variable, applicable to emerging adults, referring to the aggregation of his or her commitment to a broad professional field and intention to enter a particular occupational role at the appropriate time in the near future. This state is both cognitive and affective, is measured at a specific time, and is mutable (i.e., not a personality or other stable trait). It is stated in the negative—“career uncertainty” rather than “career certainty”—because the theoretical foundation of the research considers career uncertainty natural, and is concerned with emerging adults who do experience career uncertainty. It is an assumption of this research that emerging adults who have not yet launched their careers, who are in the pre-work period of the school to work transition, experience at least some career uncertainty due to their situation and the impossibility of predicting the future. Therefore, for the population of interest in this research, career uncertainty is not defined at the value of zero.
WELL-BEING

As described in Chapter 1, well-being is a broad outcome measure that relates to both individuals’ subjective experiences and evaluations, and the non-subjective state of their lives. How you feel, emotionally, physically, and mentally, can be described with the terms subjective well-being. How you are actually doing, in terms of your life, health, social situation and behavior, falls under the somewhat misleading term “psychological well-being”. These two types of well-being can become disconnected: in the early stages of heroin addiction, for example, people experience a sense of extreme physical vigor and health, even though in fact, heroin is extremely bad for them. For the most part, however, subjective and psychological well-being works together.

Like agency, well-being can be discussed at both a global level and a domain-specific level. Larson and Majors (1998) note in their work on career indecision in young adulthood that affective distress related specifically to career is a frequently reported phenomenon. They argue that career-related affective distress is comparable to Jones’s (1989) construct, career decision status comfort. In their instrument, Coping with Career Indecision, Larson and Majors describe affective distress as including feeling down, avoidance, self-blame, hopelessness, worry, and pressure. In their research, they found that the affective distress subscale of the Coping with Career Indecision instrument correlated significantly with the Negative Affect schedule from the PANAS-X (Watson and Clark, 1994). The PANAS Negative Affect schedule is not domain-specific and includes a wider range of distress symptoms, such as fear and guilt.

Defining and measuring well-being, even within a specific domain, is a daunting task. I will borrow Desjarlais, Eisenberg, Good & Kleinman’s (1995) description of well-being as a state, not just free of mental illness, but also “in which the individual realizes his or her own abilities, can work productively and fruitfully, and is able to contribute to his or her community,” (p. 7). In this research, I am concerned with well-being with respect to career development during emerging adulthood, and most concerned with assessing and reducing threats to well-being. For subjective well-being, I will focus on common symptoms of emotional distress–grouped together as negative affect–such as
anxiety, unhappiness, avoidance, pessimism, and behaviors such as ruminating, crying, and withdrawing. For psychological well-being, I will look for evidence of active engagement and positive outlook.

THE INTERVENTION: “DESIGN YOUR LIFE”

In addition to examining the relationship between individual agency and well-being, this research also seeks to evaluate an intervention related to career development in emerging adults. The intervention was a ten-week class for undergraduate juniors and seniors at Stanford University, called “Design Your Life”. According to the course website, instructors “employ a design thinking approach to help students from any major develop a constructive and effective approach to finding and designing their vocation,” (“Designing Your Life,” 2012). Although the instructors did not explicitly intend to promote agency as it is defined here, an examination of the course components reveals a strong theoretical link between the syllabus and class activities, and the outcomes of enhancing self-efficacy and reducing dysfunctional beliefs. Specifically, the innovative use of “design thinking” in relation to career development provided a conceptual framework that facilitated the release of career related dysfunctional beliefs. Secondly, the course’s emphasis on practicing career development skills and behaviors provided a direct route for increased career development self-efficacy.

To understand how design thinking can reduce dysfunctional beliefs related to career, we must look closely at what design thinking is. Although it was originally conceived and most commonly used in the context of engineering and product design, design thinking can be used to deal with “wicked problems” in nearly any field. Almost twenty years ago, Buchanan (1992) noted, “we have seen design grow from a trade activity to a segmented profession to a field for technical research and to what now should be recognized as a new liberal art of technological culture, “ (p. 5). In other words, design and its related problem-solving process, design thinking, has become extraordinarily popular (e.g. Martin, 2009).
While there is not a single comprehensive definition of design thinking, it is known as a problem-solving process with certain agreed-upon key elements. Most importantly, it is a human-centered methodology, meaning that an orientation towards meeting the needs of real people underlies every component of the process. Brown (2008) identifies three stages in design thinking: inspiration, ideation and implementation. Inspiration includes understanding the problem, doing research, and organizing information synthetically; ideation refers to brainstorming, prototyping, testing, and re-designing; finally, implementation is execution of the solution, with the recognition that it is not final – implementation leads to new projects or the next iteration of the current one.

The characterization of design thinking as a cycle is a common theme. The design firm IDEO (2011), for example, lists “evolution” as the final step of using design thinking in education, following discovery, interpretation, ideation, and experimentation. Discovery describes the stage of dealing with a new challenge and trying to understand and approach it. Interpretation is the synthesis of the discovery stage, when information is collected, compared, and searched for insights. Ideation is free-form, no-holds-barred, non-judgmental idea generation. Experimentation involves sketching, building, testing, getting feedback, and trying again. Finally, evolution refers to the ongoing work on the given challenge, including communicating your results, reflecting on what you learned, and taking next steps.

As described by Evans (2009), there are multiple steps within the design thinking process, which overlap a great deal with the previous theories. Need-finding, or a “deep dive”, is an empathetic engagement with all aspects of a given design challenge. Then, by acting on the plans generated through brainstorming, designers enter the prototyping stage. Real-life prototypes create new situations and generate insights. The entire process is iterative, so multiple rounds of brainstorming and prototyping continue until a final solution emerges. Table 3.1 compares the different views of design thinking from Evans, Brown and IDEO.
Table 3.1. *Comparison of design thinking stages by author*

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Early</td>
<td>Inspiration</td>
<td>Discovery &amp; Interpretation</td>
<td>Acceptance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Need-finding “Deep dive”</td>
</tr>
<tr>
<td>Middle 1</td>
<td>Ideation</td>
<td>Ideation</td>
<td>Brainstorming</td>
</tr>
<tr>
<td>Middle 2</td>
<td>Implementation</td>
<td>Experimentation</td>
<td>Prototyping, Iteration, Feedback</td>
</tr>
<tr>
<td>Late</td>
<td>Evolution</td>
<td>Resolution</td>
<td>Learn</td>
</tr>
</tbody>
</table>

So why apply design thinking to career development in emerging adulthood? In fact, Peterson, Sampson, Lenz & Reardon’s (2002) description of career planning shares many of the characteristics of a difficult engineering or product development problem:

“The cues signaling a career problem are often complex and ill defined, and the reactions to them emotionally laden; these cues may contain either too much or too little information to effectively solve the problem at hand. Furthermore, the options to solve the problem must be created by the problem solver, and there may be no single correct or best option. In fact, with career problems it is more useful to refer to the answer as an optimal solution rather than a correct solution, because no single alternative may meet all of the conditions in a given circumstance.” (p. 317)

While it may not be obvious how designing a toaster, for example, could be like designing a career, design thinking is most useful when the problem is more complex than a common household appliance. For example, a successful design thinking project at Stanford University was an inexpensive, effective infant warmer for use in developing countries, called “Embrace”. The task as given was to deal with problems associated with maintaining expensive infant incubators in rural areas of Nepal. Infant mortality is, of
course, a complex and ill-defined problem: though the outcome is obvious, the causal contributions of various factors such as pre-natal care, availability of healthcare providers, transportation infrastructure, and physical and social resources are difficult to determine. Furthermore, caring for newborns is an extremely emotional issue. A final characteristic of a wicked design problem is that there are many potentially conflicting constraints, so no one solution may satisfy them all. For work in areas with high levels of poverty, an overriding constraint is making products extremely affordable without compromising on quality. According to Roth (2011), “The great design thinking insight was that the customers are not the doctors that run the clinics. The customers are the mothers and the infants.” Though fixing the $20,000 incubators in the hospital would save some lives, addressing the larger problem meant designing a product that could be used by mothers who were far from any medical facilities, in areas without consistent electricity.

If we compare the task of managing the school-to-work transition in emerging adulthood with that of designing an effective solution to save the lives of infants, there are relevant parallels. In both cases, the stakes are arguably high for those concerned. Though most would agree that children’s survival is more important than a young college graduate’s career path, in both cases, there is a high level of emotion involved. Also in both cases, there is the paradox of too much and too little information. One could do research into all career paths, or all ways in which infants are imperiled, but that would be information overload. There is also a paucity of information in that young adults cannot have the knowledge and wisdom regarding work that can only be gained from experience; likewise, researchers on the product design team could only approximate and observe the experiences of doctors and mothers in Nepal. Finally, in both situations, there is no one solution that is obviously “best”. Most young people have enough talents and interests that many career paths are promising; there are also many ways to reduce infant mortality. Choosing a direction in either case requires more than simple information gathering, analysis and decision-making. What design thinking brings to this process is an emphasis on deeply understanding the problem, an action-oriented approach to
prototyping, testing and iterating, and a theoretical perspective that values creativity, empathy, and willingness to take risks.

Furthermore, embedded within the design process are ten concepts that together form a core of beliefs that can challenge and replace emerging adults’ dysfunctional thoughts about career (Evans, 2009). These ten concepts, in a rough order of how they work in the design cycle, are:

1. **Human-centered**: recognizing that the most important factor to consider is the human being(s) involved in the problem or task, their needs and well-being.
2. **Acceptance**: accurately perceiving and understanding the current situation before trying to change or improve it.
3. **Ideation**: an emphasis on thinking deeply about the given problem, as well as coming up with many potential paths, ideas or solutions; brainstorming.
4. **Re-framing**: being willing to see a problem or issue from multiple perspectives, possibly changing its nature, goal, or one’s approach to it.
5. **Curiosity**: wanting to explore the problem and its potential solutions fully; not coming to a “quick fix” solution too quickly or easily.
6. **Radical collaboration**: working on the problem in unexpected ways, with people who are not necessarily the obvious or most convenient collaborators; recognizing the value in unexpected contributions and diverse teams.
7. **Synthesis**: putting understanding, research, and divergent ideas together to innovate new approaches and solutions.
8. **Culture of prototyping**: instead of trying to get it “right” the first time, being willing to “try out” multiple rough drafts; iteration.
9. **Bias towards action**: trying things actively rather than focusing on a purely conceptual effort, more “doing” than “[just]thinking”.
10. **Mindfulness of process**: throughout the design process, being aware of what one is doing and how it is going; self-monitoring, reflection and regulation; documentation.
Table 3.2 applies theses concepts to the dysfunctional beliefs that emerging adults may have about career choice and career development. Dysfunctional beliefs can be insidious and difficult to ameliorate. While it may seem simple to tell emerging adults that their beliefs about career choice and development are mistaken and dysfunctional, actually changing the complex set of thoughts and feelings that people have about their career process is not easy. Instead of trying to eliminate dysfunctional beliefs and thought patterns, the approach suggested here attempts to replace them with equally persuasive, and more helpful and functional thought patterns, specifically grounded in design thinking.
Table 3.2. *Design thinking concepts with examples of dysfunctional and functional career beliefs*

<table>
<thead>
<tr>
<th>Concept</th>
<th>Dysfunctional Belief</th>
<th>Functional Belief</th>
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<tbody>
<tr>
<td><strong>Human-centered</strong></td>
<td>My career must satisfy everyone in my life.</td>
<td>My career should focus on the well-being of myself and the people I love.</td>
</tr>
<tr>
<td><strong>Acceptance</strong></td>
<td>It is unacceptable that I am not sure about my career at this time in my life.</td>
<td>It is okay to not be sure about my career at this time in my life.</td>
</tr>
<tr>
<td><strong>Ideation</strong></td>
<td>Thinking deeply about myself and my career path will not help.</td>
<td>Thinking deeply about myself and my career path will be helpful.</td>
</tr>
<tr>
<td><strong>Re-framing</strong></td>
<td>Career indecision is a problem.</td>
<td>Career indecision is an opportunity.</td>
</tr>
<tr>
<td><strong>Curiosity</strong></td>
<td>Trying out different careers is uninteresting or frightening.</td>
<td>Trying out different careers is interesting and exciting.</td>
</tr>
<tr>
<td><strong>Radical collaboration</strong></td>
<td>Few people can help me with my career.</td>
<td>Many different kinds of people can help me with my career.</td>
</tr>
<tr>
<td><strong>Synthesis</strong></td>
<td>It is not important to integrate my career plan with my values, views of the world, and life goals.</td>
<td>My career plan should be integrated with my values, views of the world, and life goals.</td>
</tr>
<tr>
<td><strong>Prototyping</strong></td>
<td>Once I make a career decision, I must commit to it.</td>
<td>It is okay to try many different jobs and even a few different careers.</td>
</tr>
<tr>
<td><strong>Bias towards action</strong></td>
<td>I should be sure before I do anything.</td>
<td>I should actively try things out as part of my career development.</td>
</tr>
<tr>
<td><strong>Mindful of process</strong></td>
<td>It doesn’t matter how I arrive at a career path as long as I am successful.</td>
<td>Observing and learning from my process of career development will increase my success and happiness.</td>
</tr>
</tbody>
</table>
After the design thinking “bootcamp”, which took place in the beginning of the course, the class focused on increasing students’ career development self-efficacy through multiple sources: feelings of mastery, social support, vicarious experiences, and physiological and emotional states. To help participants feel more confident about their career development, students received instruction and practice for practical skills such as writing an elevator speech, networking, and conducting informational interviews. To increase feelings of social support, the class featured small group work, and students were required to meet with the instructors during office hours outside of class at least once. As not all mastery experiences can be provided in a class setting, guest lecturers provided vicarious mastery experiences, by describing their own unusual, but successful, career and life journeys. Finally, as physiological and emotional states are believed to affect self-efficacy, students were taught a number of different exercises and activities aimed at increasing positive mood, and decreasing stress. The details of the course and its implementation will be discussed more in Chapter 4.
CHAPTER 4. PILOT STUDIES

OVERVIEW

This chapter describes two pilot studies that informed the development of the conceptual model presented in the previous chapter, as well as the final design and implementation of the dissertation research. For the first pilot study, I examined self-reported data from students who enrolled in the treatment class, “Designing the Authentic Life”, in the spring quarter of 2010. The study was exploratory, and its goal was to describe students’ experiences of career uncertainty, contextual stressors, and any related consequences for psychological and subjective well-being.

The second pilot study attempted to measure the effects of the treatment. Using a selection of established scales related to the course’s theoretical foundations, I administered a pre-test and post-test questionnaire to the treatment group, and recruited a comparison group for the post-test only. The general discussion at the end of this chapter summarizes the relevant findings from both pilot studies, which led to the development of new scales for measuring career development agency, and the use of a quasi-experimental design for the dissertation research.

STUDY 1: CAREER UNCERTAINTY AND WELL-BEING

Participants

Participants were 73 undergraduate juniors (n = 29, 39.7%) and seniors (n = 44, 60.3%) at Stanford University who came to the first meeting of the course, “Mechanical Engineering 104B: Designing the Authentic Life,” in the spring quarter of the 2009-10 academic year. There were 47 women (64.4%) and 26 men (35.6%). The average age was 21.5 years; the most common age was 21. The age range was 19-41, with one participant who had graduated from high school early, and one participant who had returned to college after a twenty-year hiatus. One participant did not provide age information. Participants had a variety of majors, with the largest group studying social sciences (n = 27, 37.0%), followed by science and mathematics (n = 16, 21.9%), engineering (n = 11, 15.15%), humanities (n = 11, 13.7%) and product design (n = 9, 12.3%).
Materials and Procedure

Participants filled out a one-page questionnaire on the first day of the course, which was limited to 55 students (Appendix A). Demographic questions covered students’ ages, majors, year (junior/senior) and gender. When students reported two majors in different fields, only the first was considered. Open-ended questions included why the student wanted to take the course, what experiences they had had with career development, and what occupational fields they were considering entering.

These questionnaires were read holistically to understand the reasons students had for registering and the level of career uncertainty and negative affectivity they were experiencing. Then, a coding scheme was applied in which reasons for registering were separated into three categories: to learn about design thinking (design), to learn more generally (vocational learning), and to get help with vocational and personal uncertainty (uncertainty). When students mentioned more than one reason, only the first was coded as it was considered the primary reason.

A second code was for whether the participant indicated negative affect or outcomes about career or career uncertainty at any point in the questionnaire. Negative affect included stress, anxiety, worry, feeling overwhelmed, feeling lost, fear and other similar emotions. Negative outcomes included avoidance or procrastination, inability to commit, and somatic symptoms such as insomnia.

A third code concerned whether the participant indicated career uncertainty at any point in the questionnaire, not just as the reason for registering for the class. In addition to the open-ended questions, the questionnaire also included a section in which students indicated what fields they were considering and rated their level of interest from 1 (low) to 5 (high). At the end of the list of fields, one item said, “I really don’t know,” and students who circled 3 or higher on this list were also coded as experiencing career uncertainty even if that was not their stated reason for registering to the course.
Finally, open-ended responses were coded for whether the participant mentioned a contextual stressor that precipitated career uncertainty, negative affect or their wish to take the course. Contextual stressors included graduation, reaching a particular chronological age, or other circumstances, such as applying or being accepted to graduate school.

Results
Reasons for registering to the course

Of the 73 course applicants, the majority (n = 39, 53.4%) reported career uncertainty as their primary reason for wanting to take the course. The second group (n = 21, 28.8%) cited general learning about themselves, the world of work, and career decision-making as their first reason. The smallest group (n = 13, p = 17.8%) expressed interest in learning about design and design thinking.

A chi-squared test of independence found a significant relationship between gender and reason for registering for the course, $\chi^2 = 6.96$, d.f. = 2, $p < .05$. Looking more closely at the relationship between gender and reporting either uncertainty or vocational learning (dropping the design group from the analysis because it was too small), women were more likely than men to report uncertainty, rather than vocational learning, as their reason (75% of women versus 50% of men not reporting design as their primary reason), $\chi^2 = 3.96$, d.f. = 1, $p < .05$.

There was no relationship between year (junior/senior) and reason for registering for the course, $\chi^2 = 2.20$, d.f. = 2, $p = .33$. This remained true even when looking only at uncertainty versus vocational learning. Juniors and seniors were about the same in their reasons for applying, with slightly more than 50% in each group citing uncertainty as their main motivation.

While the numbers of students in each academic field were too small for statistical analysis, an impressionistic review indicated that science or mathematics majors had the largest percentage of undecided applicants (81.3% of science/math
majors). Being undecided was also the primary reason for engineering (54.5%) and humanities majors (60.0%), and was tied with vocational learning for product design (44.4%) and social science majors (37.0%).

**Prevalence of career uncertainty overall**

Looking across the three spaces in which participants could indicate career uncertainty (as a reason for applying, as part of other open-ended question, or by indicating 3 or higher on the “I really don’t know what field I want to enter” item), the total prevalence of reported career uncertainty was 75.3% (n = 55). There was no relationship between year and uncertainty ($\chi^2 = 1.42$, d.f. = 1, $p = .23$), and there was no relationship between gender and uncertainty ($\chi^2 = .81$, d.f. = 1, $p = .37$).

Although the “Really don’t know” item was last on the questionnaire and optional, 29 participants (39.7%) chose to answer this item, with almost all who responded to the item circling “5” to indicate a high level of uncertainty.

**Negative affect/outcomes related to career decision-making**

Coding for negative affect and outcomes related to career decision-making revealed that 24.7% (n = 18) of the group reported some kind of negative emotion or outcome. Of these, 17 also indicted uncertainty at some point in their questionnaire, making a trend towards a significant relationship between uncertainty and negative affect or outcomes (with Yates’ correction for expected values under 5, $\chi^2 = 3.43$, d.f. = 1, $p = .06$). There was no relationship between negative emotion/outcome and gender ($\chi^2 = 1.87$, d.f. = 1, $p = .17$). There was also no relationship between negative emotion/outcome and year ($\chi^2 = .01$, d.f. = 1, $p = .93$).

**Contextual stressors**

A binary variable was created for whether a contextual stressor or situation was mentioned at any point during the questionnaire as a reason for career uncertainty or discomfort. Out of the 73 respondents, 34 (46.6%) did mention a contextual stressor, out of which the large majority (n = 30) cited graduating from college. There was a
significant relationship between year and contextual stressor, such that many more seniors (n = 25) than juniors (n = 9) mentioned a contextual stressor ($\chi^2 = 4.67, \text{ d.f.} = 1, p < .05$). Uncertainty was also related to contextual stressors ($\chi^2 = 5.70, \text{ d.f.} = 1, p < .05$).

The largest group of students were those who mentioned a contextual stressor and also indicated uncertainty (n = 30, 41.1%), followed by students who were undecided but did not mention a contextual stressor (n = 25, 34.3%), followed by those who neither mentioned a contextual stressor nor uncertainty (n = 14, 19.2%), and those who mentioned a contextual stressor but did not indicate that they were undecided (n = 4, 5.5%).

Discussion

This sample of undergraduate juniors and seniors who applied for a course entitled “Designing the Authentic Life,” demonstrates that for at least some emerging adults nearing the end of their college careers, career uncertainty is an important and pressing issue. While this seems natural given that students self-selected into this course, it does show that students seeking vocational guidance are more likely to be doing so because they are undecided rather than because they uncomfortable or uncertain with their decision. While one cannot generalize to students who did not apply for the course, this examination gives some limited evidence for career uncertainty as an important experience for some emerging adults in college.

It is interesting that while women were more likely than men to report career uncertainty as their primary reason for entering the course, both genders were equally likely to report uncertainty at some point in their questionnaire. It is possible that women are more comfortable admitting a potentially embarrassing situation, career uncertainty, as their main motivation for a course, while men preferred to frame their motivation as a positive desire to learn rather than a problem to be ameliorated. If gender differences in reporting behavior are indeed having an effect, it will be important to take this into account in measuring and analyzing attitudes towards career uncertainty in future studies.
Another informative finding from this exploratory study is that juniors and seniors who applied to the course did not differ in their prevalence of career uncertainty. While it is plausible that seniors find career decision-making a more salient problem, as more seniors than juniors applied for the course, some juniors were also concerned about their career decisions as well. As upperclassmen, they may realize that graduation is approaching even though it is not imminent. Therefore, it seems that the perception of upcoming transition is more relevant to career uncertainty than the actuality of that change.

Nevertheless, the objective reality of an imminent life change was on the minds of many students, particularly the seniors. The majority of seniors (56.8%) mentioned graduation or life after college spontaneously in their questionnaire, often in response to the question of why they wanted to take the class. The most common response pattern was something like, “I’m graduating this year and I have no idea what I want to do after that.” Often, students mentioned stress, anxiety, worry, frustration or feeling overwhelmed in conjunction with their observation about this upcoming life change and the necessity of “figuring out” what to do next. Furthermore, the question, “What do you hope this class is not about?” drew a number of answers that students did not want to be told to find or follow their passion; this advice was not considered useful. Many students indicated that they had already sought advice of parents, friends, and university faculty and staff such as those at the Career Development Center. These responses indicate that a number of students were concerned about their future lives and careers, and actively taking steps to make productive plans – but nevertheless, facing challenges.

It was somewhat surprising, then, that only a quarter of applicants mentioned any negative emotions or outcomes in their information sheets. Given that negative emotions are considered personal and it is not as socially acceptable to share them openly as it is for positive emotions, it is possible that some students who were experiencing negativity did not report it on the questionnaire – I did not ask them directly about negative affect. The fact that students who reported negative affect did so without any prompting underscores the salience of negative affect in their lives. Furthermore, there was some
indication of a relationship between uncertainty and negativity, with 17 out of 18 students with negative affect also reporting uncertainty. There were also 38 students, however, who cited uncertainty without any negative affect. One explanation is that while many students are undecided, only some experience negative affect or outcomes as a result of this uncertainty. Questions that remain are why some students experience negative affect as a result of career uncertainty, and what can be done to reduce the negativity of their experience. In the second pilot study, I examined a treatment designed for this purpose.

**STUDY 2: DESIGN THINKING INTERVENTION**

*Participants*

Participants were recruited from two elective classes (Table 4.1). The first was open to any undergraduate junior or senior at Stanford University (I will refer to this group as “Treatment - undergraduate”). The second class had a nearly identical syllabus and pedagogy, but was slightly modified for doctoral students (“Treatment – graduate”).

A comparison group was recruited from two sources and designed to roughly match the treatment group on gender, educational level, and interest and motivation in vocational issues. The first source was students who registered for either of the treatment classes but did not take it, either because they were denied admission or dropped the course. To choose students for the undergraduate class, which had an enrollment cap, the instructors gave some preference to seniors, and selected students who made the group more balanced due to their gender or major. The second source for the comparison group was a pool of students who had had appointments at the university career center.
Table 4.1. Participation in second pilot study, by group

<table>
<thead>
<tr>
<th>Group</th>
<th>Invited N</th>
<th>Completed N (M, F)</th>
<th>Completion Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment – undergraduate</td>
<td>52</td>
<td>39 (15, 24)</td>
<td>75%</td>
</tr>
<tr>
<td>Treatment – graduate</td>
<td>22</td>
<td>22 (10, 12)</td>
<td>100%</td>
</tr>
<tr>
<td>Comparison – undergraduate</td>
<td>117</td>
<td>29 (5, 24)</td>
<td>24.8%</td>
</tr>
<tr>
<td>Comparison – graduate</td>
<td>80</td>
<td>21 (7, 14)</td>
<td>26.3%</td>
</tr>
</tbody>
</table>

Treatment

The class took place during the Spring 2010 academic term. While the instructors often lectured briefly, students also discussed readings and experiences in small groups, heard personal stories of guest speakers, wrote reflective essays, and attended office hours. The first sessions were a “Design Boot Camp”, in which students explored the design cycle through group and individual activities. Next, students reflected on the “big questions” surrounding the meaning of work and life, while studying related topics such as positive psychology, for example, Csikszentmihalyi’s (1990) theory of flow. Concrete career-related skills such as networking and informational interviews were also practiced. Students’ final projects, or “Odyssey Plans”, were personal-vocational five-year plans presented to their small group or the class. The experience was highly social and allowed students to continue the learning process either individually or with other students outside of class.

Design & Procedure

This study used a quasi-experimental design with both within- and between-subjects factors. The within-subjects factor was time, with participants in the treatment group completing a questionnaire at the beginning and end of the course. The between-subjects factor was group (treatment/comparison). Students in the comparison group were contacted near the end of the academic term and asked to take an online questionnaire during the same period as the students in the treatment classes. The online questionnaire included the following scales:
1. Career Decision-Making Self-Efficacy Scale – Short Form (Betz, Klein, & Taylor, 1996)
2. Goal Selection, Optimization, and Compensation Questionnaire (Freund & Baltes, 2002)
3. Implicit Beliefs about Career Development (developed for this study; based on Dweck’s (1998, 2007) work on implicit beliefs about intelligence).
4. Purpose in Life Scale (Ryff, 1989)
5. Self-Liking/Self-Competence Scale-Revised (SLCS-R) (Tafarodi & Swann, 2001)

The Career Decision-Making Self-Efficacy Scale included a range of items, such as self-knowledge (“I am confident that I could accurately assess my own abilities,“), dealing with challenges (“I am confident that I could persistently work at my major or career goal even when I get frustrated,”), decision-making, and employment activities such as writing a resume and giving a job interview.

The Goal Selection, Optimization, and Compensation questionnaire had three subscales focusing on an individual’s general tendency to elect certain goals and stick to them, capacity to recognize which goals had the best chances of success, and strategies for handling situations in which goal achievement was becoming difficult. These questions were not specifically related to the career domain.

The Implicit Beliefs about Career Development scale was developed for this study and based on Dweck’s (1998, 2007) work on implicit beliefs regarding intelligence. Specifically, I took the 14 items from that scale and rewrote them to focus on career development rather than intelligence. Table 4.2 compares the items from each scale. The goal of the revisions was to measure an individual’s beliefs about the intrinsic malleability of career plans and career success. For example, agreement with the item “Your success is determined by the career choices you make now,” reflects an entity belief in career development— you cannot do much to change things once you have started a given career path. In contrast, agreement with the item, “Criticism from others
can help develop your career plan,” indicates a belief that career development is something that is mutable (incremental) through individual effort and others’ assistance.
Table 4.2. *Items from the Implicit Beliefs about Intelligence Scale and related items created for the Implicit Beliefs about Career Development Scale*

<table>
<thead>
<tr>
<th>Intelligence (Dweck, 1989)</th>
<th>Career Development</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entity</strong></td>
<td></td>
</tr>
<tr>
<td>You are born with a fixed amount of intelligence.</td>
<td>You are born with a predisposition towards a certain calling or profession.</td>
</tr>
<tr>
<td>Good performance in a task is a way of showing others that you are intelligent.</td>
<td>If you know what you want to do in the future, other people will think of you as successful.</td>
</tr>
<tr>
<td>You have a certain amount of intelligence and you cannot do much to change it.</td>
<td>You have certain career paths available to you, and you cannot do much to change that.</td>
</tr>
<tr>
<td>If you fail in a task, you question your intelligence.</td>
<td>If you don’t have a clear plan for your professional future, you question your capacity for success.</td>
</tr>
<tr>
<td>When you exert a lot of effort, you show that you are not intelligent.</td>
<td>When you exert a lot of effort to figure out your professional future, you demonstrate that you are not going to be successful.</td>
</tr>
<tr>
<td>Difficulties and challenges prevent you from developing your intelligence.</td>
<td>Difficulties and challenges prevent you from developing a successful career plan.</td>
</tr>
<tr>
<td>Your abilities are determined by how intelligent you are.</td>
<td>Your success is determined by the career choices you make now.</td>
</tr>
<tr>
<td><strong>Incremental</strong></td>
<td></td>
</tr>
<tr>
<td>Good preparation before performing a task is a way to develop your intelligence.</td>
<td>Carefully reflecting and then trying things out are ways to develop a successful professional path.</td>
</tr>
<tr>
<td>Performing a task successfully can help develop your intelligence.</td>
<td>Doing skills and preferences identification activities can help you plan for your professional future.</td>
</tr>
<tr>
<td>You can develop your intelligence if your really try.</td>
<td>You can develop a successful plan for your future career if you really try.</td>
</tr>
<tr>
<td>When you learn new things, your basic intelligence improves.</td>
<td>When you learn and try new things, your ability to shape your future career path improves.</td>
</tr>
<tr>
<td>The effort you exert improves your intelligence.</td>
<td>The effort you exert improves your capacity to create a career path that’s right for you.</td>
</tr>
<tr>
<td>If you fail in a task, you still trust your intelligence.</td>
<td>If you have no idea what your career path will look like, you still trust that you will be able to plan for a successful professional future.</td>
</tr>
<tr>
<td>Criticism from others can help develop your intelligence.</td>
<td>Criticism from others can help develop your career plan.</td>
</tr>
</tbody>
</table>
The Purpose in Life scale assessed the extent to which an individual felt motivated, active and directed in his or her every day life and planning for the future. Some items were stated in the positive, such as, “Some people wander aimlessly through life, but I am not one of them”. Other items were stated negatively, such as, “I used to set goals for myself, but now that feels like a waste of time”. All of the statements were global, referring to an individual’s life and future holistically, and were not specifically focused on career or occupation. This scale was included because the course instructors did not feel that the course would help with purpose in life generally; therefore, it was included as a potential indicator of strong demand characteristics in the questionnaire.

Finally, the Self-Liking/Self-Competence scale was included as a general measure of self-esteem and self-related positive affect. Given that career uncertainty could be a threat to self-esteem, a course on vocational discovery was expected to increase comfort with one’s own decision status and oneself overall. Again, the items on this scale were not related specifically to career or occupation. A mixture of positively and negatively worded items examined constructs related to self-worth, sense of personal talent and accomplishment, comfort with self, security, and personal effectiveness. Nearly all of the scales had acceptable reliability at pre-test, as established by Cronbach’s alphas above .70, except Goal Selection, Optimization and Compensation (Table 4.3).

Table 4.3. Reliability for all scales at pre-test (treatment group only)

<table>
<thead>
<tr>
<th>Scale</th>
<th>N</th>
<th>Alpha</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Decision-Making Self-Efficacy</td>
<td>62</td>
<td>.89</td>
<td>25</td>
</tr>
<tr>
<td>Goal Selection, Optimization, Compensation</td>
<td>62</td>
<td>.65</td>
<td>18</td>
</tr>
<tr>
<td>Implicit Career Beliefs</td>
<td>64</td>
<td>.71</td>
<td>14</td>
</tr>
<tr>
<td>Purpose in Life</td>
<td>65</td>
<td>.79</td>
<td>9</td>
</tr>
<tr>
<td>Self-Liking/Self-Competence</td>
<td>64</td>
<td>.91</td>
<td>16</td>
</tr>
</tbody>
</table>

Results

As undergraduate and graduate students have different personal and professional
experiences, they may have entered the course with different vocational beliefs and skills. To test for effects of educational level, an \textit{a priori} independent samples \textit{t} test was conducted on the mean scores of undergraduate and graduate students for each of the five pre-test scales; there were no significant differences (\( p > .05 \)). Therefore, treatment classes were combined for subsequent analyses.

\textbf{Within Subjects}

Fifty students (30 women) from the treatment classes completed all dependent measures at both pre-test and post-test. A 2 x 2 x 2 repeated measures multivariate analysis of variance was conducted with time (pre, post) as the within-subjects factor, and gender and level (undergraduate/graduate) as between-subjects factors. Results indicated a significant multivariate effect of time, \( F(5, 41) = 19.92, p < .001 \).

Univariate analyses indicated that all measures were higher at post-test, with a significance level of \( p < .001 \) for each. Partial \( \eta^2 \) was in the .33-.37 range for Self-Liking/Self-Competence, Implicit Incremental Career Beliefs, Goal Selection, Optimization, and Compensation and Purpose in Life scales; this suggests relatively small effects for these outcome variables. For Career Decision Making Self-Efficacy, however, partial \( \eta^2 \) was .69; this suggests a medium-to-large effect size (Cohen, 1992).

Time interacted with educational level on the Career Decision-Making Self-Efficacy scale such that undergraduates increased more from pre-test to post-test than graduates, \( F(1, 49)= 5.58, p < .05 \) (Figure 4.1). There was also an interaction between time and gender on the Implicit Incremental Career Beliefs Scale such that women increased more than men, \( F(1, 49) = 7.27, p < .05 \) (Figure 4.2).
Figure 4.1. Career Decision-Making Self-Efficacy by group and educational level

Figure 4.2. Incremental career beliefs by group and gender

Note: Comparison group was only measured once (at post-test); dashed lines are for visual comparison only and do not indicate change over time.
Between subjects

Because the course took place over a ten-week term, it is possible that the observed increases were due to maturation or other experiences during the time period (independent of the course). To test for maturation effects, five a priori independent samples t tests were conducted on the mean post-test scores of the treatment and comparison groups. For two scales, the treatment group mean was significantly higher (Figure 4.3): Implicit Career Beliefs ($p < .01$) and Career Decision-Making Self-Efficacy ($p < .001$).

![Figure 4.3. Mean scale averages for class at pretest, comparison group at posttest, and class at posttest](image)

*Note: Bars indicate standard errors of the means.*

**General Discussion**

The pilot studies described in this chapter support the hypothesis that some emerging adults in undergraduate and graduate education experience career uncertainty as problematic, and furthermore, that the treatment can be effective at increasing career decision-making self-efficacy and reducing dysfunctional beliefs about careers within
that population. A majority of the students who applied for the undergraduate and graduate treatment class reported experiencing career uncertainty, and for many, that was their primary reason for applying for the class. Nearly half of the class applicants also mentioned a contextual stressor, such as graduating from college in the near future, as a contributing factor to career uncertainty, negative affect, or their motivation to enroll in the treatment class. These findings support Arnett’s description of emerging adulthood as a time of personal and professional change, as well as Bridges’ characterization of the school-to-work period as a time of explicit transition.

A minority of students cited any negative affect or other negative outcome related to their career uncertainty, which lends moderate support to the hypothesis that emerging adulthood and the school-to-work transition are potential periods of stress and anxiety. For the students who did explicitly say that their career uncertainty was a source of negative affect, one possible interpretation is that they have been socialized to believe that career certainty is important and normative at this point in their lives. In fact, some students wrote in their course information sheets that there were significant external social forces pushing them towards a pre-defined “good” career decision – most commonly parents, but also financial need and a poor economic climate/job outlook. Given that contextual stressors combined with erroneous beliefs could contribute to serious negative consequences—from reduced concentration and performance due to worry, to clinical anxiety, depression, and even suicide—the students who faced career uncertainty along with belief in decision normativity and external pressures are cause for particular concern.

The results of the second pilot study support the hypothesis that a design thinking-based treatment may have an impact on career-related agency mechanisms, specifically, decision-making self-efficacy and dysfunctional beliefs. Class participants progressed significantly in all of the areas considered from before the treatment to afterwards: career-related skills and confidence, self-esteem, belief in career flexibility, goal optimization and sense of purpose in life. It was only for Implicit Incremental Career Beliefs and Career Decision-Making Self-Efficacy scales, however, that class participants
exceeded the comparison group at the end of the course. Notably, these are the two domains that were most relevant to the course curriculum. This result helps distinguish between actual contributions of the treatment, and general goodwill from the students, demand characteristics of the survey instrument, or simple maturation over time. Had students merely been very happy as a result of the course, or had positive feelings towards the instructors (which was, in fact, reflected in the course evaluation data), then all measures should have been higher for the treatment group at post-test than for the comparison group. Likewise, if the improvements from pre-test to post-test were due to positive individual changes, which is expected for young adults who are live in an environment designed to encourage personal growth, then the treatment group should not have exceeded the comparison group at post-test in any area. Given that they nevertheless did, there is reason to believe that the treatment had selective positive effects in the targeted domain, career-related agency.

One limitation of the design was that the comparison group was only assessed at post-test due to logistical limitations; without a pre-test score, I could not assess their change over time and compare it to the treatment group’s change over time. As a result, a possible explanation of the findings is that the treatment group started with higher scores on the dependent measures and natural maturation caused an equal increase across measures in both groups. Yet students who choose courses on vocational discovery would most likely self-assess their career-related confidence and skills as below average. A more plausible difference is that the treatment group was more prepared to benefit from the course than the comparison group would have been. If true, this difference would reduce the generalizability of the findings and suggest that such courses may not be useful for all postsecondary students. Regardless, these findings would remain relevant for those students who are receptive to learning about vocational discovery.

While these results are promising, there are many areas in which this research could be improved. Most importantly, the theoretical link between the measures used in the second pilot study and the goals of the treatment was weak, particularly for the self-efficacy scale. As it was a pilot study, I tried to use pre-established measures with
accepted reliability and validity; however, this meant that the primary measure of self-efficacy was, in retrospect, in the wrong domain. As I argued in Chapter 1, it is precisely the focus on decision-making that we should question; however, the pilot study was launched before (and partly, to inform) my articulation of hypotheses about career development versus decision-making.

As the results for career decision-making self-efficacy were positive for the treatment group in the second pilot study, the next natural step was to attempt to replicate the findings with a measure more clearly appropriate in relation to the conceptual framework. Therefore, I redesigned the scale to focus on career development, the theoretical construct of interest, rather than decision-making. To shorten the scale and de-emphasize decision-making, nine items out of the 25 were removed. Table 4.4 shows these items along with the reasons for their removal. For the most part, these items are narrowly focused on achieving career goals through specific decision-making and decision implementation techniques. Fortunately, the scale also included items that were not limited to decision-making, such as confidence in gathering information about career options and reflecting on personal values. I retained many of these items without changes (Table 4.5) because they are more broadly concerned with career development over the long term. Finally, Table 4.6 shows the 11 items that were revised to refer to career development rather than decision-making, along with the original item.
Table 4.4. *Deleted items from the Career Decision-Making Self-Efficacy Scale*

<table>
<thead>
<tr>
<th>Reason for deletion</th>
<th>Deleted Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumes individual already has career goals</td>
<td>Figure out what you are and are not ready to sacrifice to achieve your career goals.</td>
</tr>
<tr>
<td>Not relevant to undergraduate juniors and seniors</td>
<td>Select one major from a list of potential majors you are considering.</td>
</tr>
<tr>
<td></td>
<td>Change majors if you did not like your first choice.</td>
</tr>
<tr>
<td>Overly focused on skills</td>
<td>Prepare a good resume.</td>
</tr>
<tr>
<td></td>
<td>Successfully manage the job interview process.</td>
</tr>
<tr>
<td></td>
<td>Accurately assess your abilities.</td>
</tr>
<tr>
<td>Overly specific</td>
<td>Find out the employment trends for an occupation over the next ten years.</td>
</tr>
<tr>
<td></td>
<td>Find out about the average yearly earnings of people in an occupation.</td>
</tr>
<tr>
<td></td>
<td>Find information about graduate or professional schools.</td>
</tr>
</tbody>
</table>

Table 4.5. *Unchanged items from the Career Decision-Making Self-Efficacy Scale*

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify employers, firms, and institutions relevant to your career possibilities.</td>
</tr>
<tr>
<td>Change occupations if you are not satisfied with the one you enter.</td>
</tr>
<tr>
<td>Define the type of lifestyle you would like to live.</td>
</tr>
<tr>
<td>Decide what you value most in an occupation.</td>
</tr>
<tr>
<td>Choose a career that will fit your preferred lifestyle.</td>
</tr>
</tbody>
</table>
Table 4.6. Revised items from the Career Decision-Making Self-Efficacy Scale

<table>
<thead>
<tr>
<th>Original Item</th>
<th>Revised Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use the Internet to find information about occupations that interest you.</td>
<td>Use various resources (for example, the Internet, or the Career Development Center) to find information about occupations that interest you.</td>
</tr>
<tr>
<td>Determine the steps you need to take to successfully complete your chosen major.</td>
<td>Take action to start exploring a career path.</td>
</tr>
<tr>
<td>Talk with a person already employed in a field you are interested in.</td>
<td>Identify, contact and meet with someone who is already employed in a field you are interested in.</td>
</tr>
<tr>
<td>Make a career decision and then not worry whether it was right or wrong.</td>
<td>Take a job without knowing whether it is the perfect job for you.</td>
</tr>
<tr>
<td>Select one occupation from a list of potential occupations you are considering.</td>
<td>Choose an occupation to try out from a list of potential occupations you are considering.</td>
</tr>
<tr>
<td>Make a plan of your goals for the next five years.</td>
<td>Make a plan for exploring your career over the next five years.</td>
</tr>
<tr>
<td>Persistently work at your major or career goal even when you get frustrated.</td>
<td>Persistently work at exploring your career even when you get frustrated or worried.</td>
</tr>
<tr>
<td>Identify some reasonable major or career alternatives if you are unable to get your first choice.</td>
<td>Identify some reasonable alternatives if you are unable to get your first choice of job or career.</td>
</tr>
<tr>
<td>Determine what your ideal job would be.</td>
<td>Identify several jobs that you are interested in actively exploring.</td>
</tr>
<tr>
<td>Choose a major or career that will fit your interests.</td>
<td>Choose a career that will fit your interests.</td>
</tr>
<tr>
<td>Determine the steps to take if you are having academic trouble with an aspect of your chosen major.</td>
<td>Determine the steps to take if you are having trouble with an aspect of your career planning and exploration.</td>
</tr>
</tbody>
</table>
Likewise, the Implicit Beliefs about Career Development scale, which I created for the study, was not as closely aligned to the intended outcomes of the treatment as it could have been. Again, because I attempted to keep the revised scale very close to the original (Dweck’s implicit beliefs about intelligence), some of the items were phrased awkwardly, and the scale was not conceptually well unified. For example, some of the items could be interpreted to conflate actual career success with successful career planning. One reason for this lack of clarity was that no one had defined or measured implicit beliefs about career development before; this was a preliminary attempt. When comparing the items from the implicit beliefs scale with other measures with a broader range of career-related beliefs, such as the Career Beliefs Inventory (Krumboltz, 1988, 2009), it became clear that beliefs about the malleability of career plans are only one potential facet of misleading thoughts that emerging adults may have. For the next study, I kept the most clearly articulated items reflecting entity career beliefs, re-wrote them for greater clarity and interpretability (Table 4.7), and removed the rest. I then wrote a new Dysfunctional Beliefs Scale (described in the following chapter) to include entity career beliefs, themes from the Career Beliefs Inventory, as well as new items related to a broader range of relevant concepts, such as normativity of early career decision, negative consequences of indecision, and importance of “finding your passion”.
Table 4.7. Revised items from the Implicit Beliefs about Career Development Scale

<table>
<thead>
<tr>
<th>Original</th>
<th>Revised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your success is determined by the career choices you make now.</td>
<td>My career will be determined by the choices I make now.</td>
</tr>
<tr>
<td>You have certain career paths available to you, and you cannot do much to change that.</td>
<td>Given my experiences and education to date, only a few career paths are practical for me.</td>
</tr>
<tr>
<td>Carefully reflecting and then trying things out are ways to develop a successful professional path.</td>
<td>Thinking deeply about myself and my future will not help me plan my career.</td>
</tr>
<tr>
<td>If you don’t have a clear plan for your professional future, you question your capacity for success.</td>
<td>I lack confidence because I don’t know what my career will be.</td>
</tr>
<tr>
<td>Criticism from others can help develop your career plan.</td>
<td>No one can help me figure out my career.</td>
</tr>
</tbody>
</table>

For the three measures for which the treatment participants did not have greater gains than the comparison group participants – those regarding purpose, goals, and self-esteem – re-examination also indicated that these scales were not the most appropriate for the treatment and outcomes of interest. Originally, these measures were included because they are related to well-being, a primary outcome of concern, and because they have been used widely in the literature related to development in emerging adulthood. As noted earlier, purpose in life, a productive approach to goal-setting and achievement, and high self-liking and feelings of competence globally are certainly aspects of a flourishing life. The treatment, however, was not designed to have such large and holistic effects, and could not be expected to change the entire psychological profile of participants in a mere ten weeks. Instead, the treatment was intended as a domain-specific intervention to help those with career uncertainty and/or career-related negative affect cope with their situation actively and positively, and increase their subjective and psychological well-being in the area of career development. Based on the uninformative findings of the pilot study using these measures, I decided to replace them with more direct and specific ways...
of examining outcomes of interest: career uncertainty, affect and emotional experience related to career status, and career-related productive behaviors.

In retrospect, intentionally collecting more specific and explicit data on the central constructs of conceptual framework would have strengthened the initial studies. In the first pilot study, I used form data to estimate the prevalence of career uncertainty and negative affect related to career. A problem with this approach is that it relied on students to come up with these responses spontaneously. As the course information sheet contained primarily open-ended questions, the students were not directly asked about their level of career uncertainty or negative affect, nor were they asked about contextual stressors that may have been aggravating the situation. Given the social desirability bias against reporting negative information (Adamaitis, 2006; Grimm, 2010), it is likely that the data I collected on career uncertainty, negative affect, and career-related contextual stressors under-represents the actual existence of these outcomes in emerging adulthood. In the second pilot study, the evidence for the treatment’s effectiveness would have been strengthened with measures that confirmed the relevant aspects of the treatment were, in fact, extant. Specifically, a measure of learning related to the design thinking curriculum – the most novel part of the treatment – would support the conceptual link between design thinking principles and reduced dysfunctional beliefs about career. Furthermore, a measure of career development behaviors would confirm that the course participants were actually doing their homework assignments, and provide a potential explanation for how the treatment increases career-related self-efficacy.

The following chapter describes how I attempted to address the limitations in the pilot studies by using new or re-designed measures for a quasi-experimental questionnaire study, including a treatment group and two comparison groups at both pre-test and post-test. The study focused on the same treatment, which is offered most academic quarters, and limited its sample to undergraduate juniors and seniors to offer a focused look at a slice of time in the experience of college-attending emerging adults. A key contribution of the research is the creation, implementation and evaluation of a measure for participants’ adoption of design thinking, which was roughly half of the
treatment curriculum. Similarly, I will also describe initial results for the novel scales regarding career development self-efficacy and dysfunctional beliefs, which were based on the pilot studies reported above, and further revised based on data from the next round of research.
CHAPTER 5. METHODS AND MEASUREMENT

OVERVIEW

This research was designed to evaluate the effects of a class called “Design Your Life”, described in the previous chapter and presented in more detail below. Within the constraints imposed by the applied setting, I took a quantitative approach to methods and measurement. The overall design of the research was quasi-experimental, with a class condition compared with two other groups that approximated control and comparison conditions. One of the biggest challenges of the research process was selecting or designing measurements for new theoretical constructs, particularly career development agency and its components. This chapter describes how I used data from the study to explore and refine the measures, which were adapted from prior literature or created specifically for this study. As with the research design, the measures were constrained by practical considerations such as the need to keep the length of the questionnaire to a minimum, as it was a required part of the class, and the instructors did not want the research agenda to burden students or reduce the quality of the experience. To encourage high-quality data, the measures were shortened or condensed to be as efficient as possible. This chapter reviews the study’s main research questions, and then details the methods used to explore them, including design, participants and procedure.

RESEARCH QUESTIONS

1. How does the intervention, “Design Your Life”, impact career uncertainty, career development agency, and career-related well-being for emerging adults?

Hypothesis 1: The intervention will increase career development agency through the mechanisms of career development self-efficacy and beliefs, and will also increase career-related well-being, but will not impact career uncertainty or contextual stressors.

2. How well do career uncertainty and career development agency predict career-related well-being in emerging adulthood?
Hypothesis 2: Subcomponents of agency – self-efficacy, beliefs and contextual stressors – predict career-related negative affect. Career uncertainty does not predict negative affect directly, but interacts with agency subcomponents such that only those emerging adults with low agency are negatively impacted by career uncertainty.

DESIGN

The study used a quasi-experimental design with both within- and between-subjects factors, as shown in Figure 5.1. There were three conditions: class, waitlist and non-applicant; assignment was not random. The treatment condition consisted of students who were admitted to the class, “Design Your Life”, based on their year in college, major and gender (I will refer to this as the “class” condition). The control condition consisted of students who applied for the class but were not granted admission in that quarter (I will refer to this as the “waitlist” condition). The course instructors (not the researcher) made these assignments, with the primary goal of creating a class with a balanced gender ratio and relatively equal proportions of humanities and social sciences, science and engineering, and other majors. Seniors had priority over juniors (only upperclassmen could enroll), as juniors were able to re-apply for the course the following year. As more women than men applied, proportionately more men were placed into the treatment condition due to the instructors’ desire to have a gender-balanced class.

The third group of participants was drawn from the general student population, using a sample of convenience. Any student who received an email link to the questionnaire could participate, but their data were removed if they indicated on the questionnaire that they had taken the class in any previous academic quarter.

The within-subjects factor was time: all participants were asked to complete a pretest and posttest. A period of approximately ten weeks separated the pretest and posttest; there were no intervening measurements. All of the pretest measures were also given at posttest; however, the posttest also included a new learning measure.
Figure 5.1. Research design including sample, conditions, and testing times

METHOD

Participants

Participants (N = 176), all students at Stanford University, were recruited to take an online questionnaire (henceforth referred to as the “pretest”) in the beginning of the winter academic quarter (early January 2011). Table 5.1 gives the numbers of participants by condition. The class and waitlist conditions came from all the class applicants, while the non-applicant condition was the “comparison” or general student body sample.
Table 5.1. Participants by group at pretest and posttest

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest N</th>
<th>Posttest N*</th>
<th>Attrition Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>50</td>
<td>42 + (1)</td>
<td>16.0%</td>
</tr>
<tr>
<td>Waitlist</td>
<td>30</td>
<td>20 + (4)</td>
<td>33.3%</td>
</tr>
<tr>
<td>Non-applicants</td>
<td>96</td>
<td>42 + (0)</td>
<td>56.3%</td>
</tr>
<tr>
<td>Total</td>
<td>176</td>
<td>104</td>
<td>40.9%</td>
</tr>
</tbody>
</table>

*Numbers in parentheses indicate new participants who had not taken the pretest.

Out of a total of 133 class applicants (class and waitlist together), 80 participated in the pretest for a response rate of 60.2%. From the general student body, it was impossible to calculate the exact number of students who were invited because the available email addresses were aggregates (e.g., a list-serv for all students living in a dorm) rather than individually listed by name. Based on dorm, student group and class sizes, however, the estimated total invitees (not counting email forwarding among students, which could not be tracked) was 1,195. A total of 199 students participated, for a response rate of 16.7%. Of these, 103 were removed because they were freshmen or sophomores, and were not an appropriate comparison for the upperclass students in the treatment class. Fifth-year seniors (n = 3 across conditions) were included as seniors. The final participants included in the analysis were nearly equally class applicants and non-applicants. Among these, the average age at pretest was 22 years and did not vary significantly by condition.

A majority of participants was female (61%) and undergraduate seniors were more numerous than juniors (62% seniors). Table 5.2 shows gender by year in college and time (pre / post). Participants were relatively representative of the student body in their racial/ethnic diversity, with white students making up the largest single group at 38% (n = 66), multi-racial students the second largest at 21% (n = 36) and East or South Asian (e.g., Indian) the third largest at 18% (n = 32). Students reporting other ethnicities made up another 22% (n = 39) of the sample. Though participants were ethnically
diverse, a large majority of those who responded to the demographic questions had attended secondary school in the United States (pretest percentage of participants from domestic high schools was 89.2%, n = 157).

Table 5.2. *Participants by gender, year and time*

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Posttest</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Juniors</td>
<td>Seniors</td>
<td>Total</td>
</tr>
<tr>
<td>Men</td>
<td>25 (14.3%)</td>
<td>43 (24.6%)</td>
<td>68</td>
</tr>
<tr>
<td>Women</td>
<td>42 (24.0%)</td>
<td>65 (37.1%)</td>
<td>107</td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>108</td>
<td>175*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Juniors</th>
<th>Seniors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>12 (11.0%)</td>
<td>28 (25.7%)</td>
<td>40</td>
</tr>
<tr>
<td>Women</td>
<td>19 (17.4%)</td>
<td>45 (41.3%)</td>
<td>64</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>73</td>
<td>104*</td>
</tr>
</tbody>
</table>

* One participant at pretest and five at posttest did not report gender.

Participants were asked to self-report their major(s) (as all rising juniors must declare their majors, there were no “undecided” participants—according to the registrar’s definition). These majors were then sorted into three groups: humanities and social sciences, STEM disciplines (natural sciences, technology, engineering and math), and design-related fields (mechanical engineering, design and architecture). When participants reported more than one major in different groups, only the first listed was used; however, in most of the few cases of double majors, both fields of study were in the same group. As Table 5.3 shows, the participants were mostly split between STEM and Humanities/Social Science majors at pretest, with only a handful of students in design-related departments. Although there were proportionately more humanities majors in the class than the non-class conditions, a chi-square test of independence showed that there was no statistically significant relationship between group and major field, when looking at only humanities and STEM related disciplines (n = 75, \( \chi^2 = 0.15, p = .697 \)). The design-related fields had so few participants that it was not appropriate to test their frequency statistically.
Table 5.3. Participants’ self-reported field of primary academic major at pretest

<table>
<thead>
<tr>
<th></th>
<th>Sciences, Tech., Eng. and Math</th>
<th>Humanities and Social Sciences</th>
<th>Mechanical Engineering, Design and Architecture</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class (n = 50)</td>
<td>18 (36%)</td>
<td>29 (58%)</td>
<td>3 (6%)</td>
<td>0</td>
</tr>
<tr>
<td>Waitlist (n = 30)</td>
<td>12 (40%)</td>
<td>16 (53%)</td>
<td>2 (7%)</td>
<td>0</td>
</tr>
<tr>
<td>Non-applicants</td>
<td>46 (48%)</td>
<td>41 (42%)</td>
<td>5 (5%)</td>
<td>4 (4%)</td>
</tr>
<tr>
<td>(n = 96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>76 (43.2%)</td>
<td>86 (48.9%)</td>
<td>10 (5.7%)</td>
<td>4 (2.3%)</td>
</tr>
</tbody>
</table>

Attrition

Of the 176 pretest participants, 59% took the posttest; there were also five new participants (total posttest N = 109). Attrition varied by condition, because the class members were required to take the questionnaire as a homework assignment while the non-class members were offered an incentive to complete the posttest. Despite this requirement, some of the students in the treatment class failed to complete the assignment at posttest. Therefore, in the final posttest pool, including new participants, there were 43 class members, 24 in the waitlist condition and 42 in the non-applicant group from the general student body.

Although there was a 41% overall attrition rate between pretest and posttest, examination of the demographic profile both times does not reveal any meaningful differences. At posttest, as at pretest, there were more women than men, and more seniors than juniors, in relatively similar proportions. The ethnic representation within the sample was highly similar at posttest, with white, multi-racial, and or South Asian students making up the largest three groups, and Hispanic, Black, Native American or Pacific Islander, and other ethnicity students comprising the remainder.

For the theoretical constructs of interest in this research, measures for which I describe below, later analysis (described in the following chapter on results) revealed that
there were no pretest differences by attrition. Therefore, I was not worried about potential self-selection effects caused by attrition at posttest.

**PROCEDURE**

At both pretest and posttest, participants received an invitation to participate in the study through email. They then clicked on a link to the online questionnaire, and were taken to a secure survey website (Qualtrics Inc., 2010). Of the participants who were recruited from the general student body, most found out about the study through their campus residence or dormitory email list, with relatively few coming from other (non-treatment) classes, sports, or student groups (Table 5.4). In the “Other” category, most participants had gotten the link to the questionnaire as a forwarded email from a friend.

Table 5.4. *Non-applicants condition, participants by source (as reported at pre-test)*

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campus Residence</td>
<td>51</td>
<td>52.6%</td>
</tr>
<tr>
<td>Student Organization</td>
<td>11</td>
<td>11.3%</td>
</tr>
<tr>
<td>Athletic Group</td>
<td>9</td>
<td>9.3%</td>
</tr>
<tr>
<td>Class (other than treatment)</td>
<td>4</td>
<td>4.1%</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>22.7%</td>
</tr>
<tr>
<td>Total</td>
<td>97*</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

*One student reported getting the questionnaire from two sources.*

The questionnaire was anonymous, though participants provided some identifying information (e.g. birth date), which allowed their responses to be matched at pretest and posttest (for those participants who shared birthdates, other personal information such as gender, major and GPA were sufficient to create a match between pretest and posttest). Participants completed the questionnaire on their own computers at a time of their choice,
and typically took 10-20 minutes to finish it, though some took longer (up to four days). The questionnaire was available online for a total of one week at both pretest and posttest and participants received several reminder emails before the questionnaire was closed. At both times, participants were offered a five-dollar gift card to a vendor of their choice (Starbucks, Jamba Juice, Amazon.com or PayPal) as an incentive for participation.

**Description of Treatment**

The class studied in Winter 2011 was highly similar to the previous year’s class, described in the previous chapter on pilot studies. Offered through the Department of Mechanical Engineering, the class met once a week for ten weeks on Friday afternoons. The curriculum included lectures by two co-instructors, in-class activities, small and large group discussions, reading assignments, action-based homework assignments, guest lecturers, and frequent work in small groups. Additionally, all students were required to attend office hours with one of the instructors at some point during the course. The class was offered for two units on a grading basis of pass or fail only. Attendance, participation and homework completion were all required in order to pass. According to the syllabus, the course uses a design thinking approach to help participants towards various goals: “Integrate your degree with your goals; provide tools and a framework to help build them; position you in the world; and develop lifelong positive practices.”

A major structural component of the class was that students were permanently assigned to a small group, consisting of eight or nine students who were selected to foster diverse and stimulating peer sharing opportunities. Each small group also had a teaching assistant (a previous graduate of the course or member of staff from the university Career Development Center), who acted as a facilitator for the group throughout the quarter. In each class session, students shifted frequently between small group and whole-class activities and discussions.

The curriculum of the course covered three broad categories: design thinking, information about jobs and careers, and practical techniques for job seeking and occupational success. In the introductory session, the instructors provided context and
justification for the class by presenting work on emerging adulthood and life stage theory. Specifically, they covered material about how young adults ages 18 to 30 have more frequent job and life changes than previous generations, and a longer time period before making long-term commitments such as marriage and having children. The first lecture also talked about how today’s young adults will most likely have multiple distinct professional roles over their lifetimes and even, potentially, more than one full career. Design thinking was then introduced as a problem-solving methodology well-suited to the “wicked problem” of making not one, but many decisions about one’s life and career, while navigating between the Scylla of personal and financial constraints, and the Charybdis of seemingly unlimited opportunities.

After the first session, the course moved into a “design thinking boot camp”, in which participants learned the fundamental principles of design thinking, and practiced these procedures both individually and in small groups. For example, students worked in teams on the “marshmallow challenge”, in which they were tasked with building the tallest possible structure using only a small set of materials, most notably uncooked spaghetti, and placing a marshmallow at the very top. After this exercise, students discussed the larger design-related themes that had come up during the exercise, such as brainstorming, reframing problems, teamwork, prototyping, and coping with challenges and failures. Another design thinking exercise was the candle task, in which students had to simply sit quietly and observe everything that they could about a small burning candle. This experience served as the seed for discussion about the power of observation, what it feels like to pay attention to detail, and how much can be learned through inspection, and introspection.

After this introduction to design thinking, which took place over two weeks, the class moved on to providing information about the world of work and relating the information to the design thinking approach and the personal questions of the students. At the same time, students began practicing techniques for self-understanding, values clarification, and goal-setting, which would be relevant later in the course when they began planning their immediate futures. Two early assignments drew upon the design
skill of “need finding”, the idea of deeply observing and understanding a problem before trying to design a solution. For the “work view” assignment, students were asked to write a short statement about their beliefs regarding work. These statements were then shared in small groups. For the worldview assignments, which came next, students had a much harder task of writing a short statement about their beliefs about the world: its nature, values, outcomes and so on. These compositions were also shared. The goal of these assignments, which was explicitly stated in the class lecture, was to help students understand themselves better, with the belief that such understanding would lead them to better and more fruitful professional paths.

An important tenet of design thinking permeating these assignments was the idea that sharing one’s beliefs with others who were both similar and dissimilar would benefit one’s own thinking. Students were encouraged to discuss each other’s perspectives, and were asked to consider how their own world or work views might be rewritten after they had learned from their small group members. Instructors also explained to the class that designers use “radical collaboration” – working in wildly diverse teams – to produce the kinds of innovative products that no one person could come up with alone.

At other times in class, discussions often centered around beliefs that college students have about work, and ways in which those beliefs may be misleading or inaccurate. For example, in one lecture, the instructor talked about the commonly held perception that one’s undergraduate major should lead directly to one’s career path, and provided data that undermined this misconception. Another way in which problematic thoughts and beliefs were challenged within the course was through guest speakers. Each quarter, several mid- to late-career professionals from different fields came to the class to share about their personal career paths and development over time. Often these stories included deviations from a previously accepted plan, unpredictable changes in employment, failures, and the productive ways in which these individuals had dealt with these challenging events and situations. In this way, the course was designed to provide inspiration, role models, and “vicarious mastery” experiences that Bandura theorized could increase self-efficacy even in the absence of actual personal experience.
As the class continued, the material shifted to more practical skills, such as giving an elevator pitch, asking for and conducting an informational interview, networking, and negotiating a job offer. In addition to instruction, the course required students to develop and practice these skills, both in class and as homework. Each week, students shared notes and thoughts about their progress with each other in their small groups; for example, reporting back on what they learned from an informational interview in one of their own occupational fields of interest. The final assignment was for students to come up with a five-year plan for post-graduation, along with alternate possibilities. They presented these plans in their small groups at the end of the quarter.

**Measures**

The questionnaire included demographic data as well as measures relating to career uncertainty, context, agency, mental health, and the intervention (details in Table 5.5). All of the measures listed below were scales, with the exceptions of Contextual Stressors, which was an index (the sum of distinct events), and a learning measure given at posttest to assess design thinking. Although the order of items was randomized within each block, the items for each scale or index were presented as a set. Table 5.6 gives the reliability (Cronbach’s alpha) for each of the scales, and pre-to-post correlations for each of the revised scales was between .48 and .72 ($p < .001$ for all). Revisions to scales were based on factor analyses (Appendix B).

**Table 5.5.** Construct, name, number of items and possible range for measures

<table>
<thead>
<tr>
<th>Construct</th>
<th>Name</th>
<th>No. Items</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Status</td>
<td>Career Uncertainty</td>
<td>2</td>
<td>2 – 10</td>
</tr>
<tr>
<td>Context</td>
<td>Contextual Stressors</td>
<td>10</td>
<td>0 – 7</td>
</tr>
<tr>
<td>Agency</td>
<td>Career Development Self-Efficacy</td>
<td>16</td>
<td>17 – 85</td>
</tr>
<tr>
<td></td>
<td>Dysfunctional Beliefs</td>
<td>17</td>
<td>10 – 50</td>
</tr>
<tr>
<td>Well-being</td>
<td>Negative Affect (Career-related)</td>
<td>11</td>
<td>0 – 73</td>
</tr>
<tr>
<td></td>
<td>Positive Affect* (Career-related)</td>
<td>4</td>
<td>n/a</td>
</tr>
<tr>
<td>Intervention</td>
<td>Career Development Behaviors</td>
<td>12</td>
<td>0 – 30</td>
</tr>
<tr>
<td></td>
<td>Design Thinking</td>
<td>2</td>
<td>n/a</td>
</tr>
</tbody>
</table>

*This scale was later combined with the Negative Affect scale (described below)*
Table 5.6. Initial and final scale reliabilities at pretest

<table>
<thead>
<tr>
<th>Measure</th>
<th>Initial</th>
<th></th>
<th>Final</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Items</td>
<td>alpha</td>
<td>Items</td>
<td>alpha</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Career Uncertainty</td>
<td>2</td>
<td>.76</td>
<td>2</td>
<td>.76</td>
<td>175</td>
<td></td>
</tr>
<tr>
<td>Dysfunctional Career Beliefs*</td>
<td>14</td>
<td>.77</td>
<td>10</td>
<td>.76</td>
<td>172</td>
<td></td>
</tr>
<tr>
<td>Career Development Self-Efficacy*</td>
<td>16</td>
<td>.93</td>
<td>17</td>
<td>.93</td>
<td>172</td>
<td></td>
</tr>
<tr>
<td>Positive Affect**</td>
<td>4</td>
<td>.83</td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Negative Affect*</td>
<td>11</td>
<td>.87</td>
<td>15</td>
<td>.88</td>
<td>174</td>
<td></td>
</tr>
<tr>
<td>Career Development Behaviors*</td>
<td>12</td>
<td>.71</td>
<td>10</td>
<td>.74</td>
<td>172</td>
<td></td>
</tr>
</tbody>
</table>

* Scale was adjusted following analysis of reliability and validity.

** Scale items were incorporated into Negative Affect scale.

Career uncertainty

To assess level of career uncertainty, the questionnaire included Jones’s two-item Career uncertainty scale (1989), which asks about both general career field (“I have an occupational field in mind that I want to work in; for example, medicine, engineering, management or the performing arts,”) and specific occupational choice (“I have decided on an occupation I want to enter; for example, electrical engineer, nurse, or designer,”). In this study, the general statement always came first and the specific item immediately after; both questions were presented on the same page within the online survey.

For both items, participants select their level of agreement with each statement on a Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). The middle selection was “Neither agree nor disagree” and no other option (such as “Don’t Know” or “N/A”) was provided; however, participants could choose not to answer the question (all but one participant answered both questions).
Following Jones’s procedure, the two items were summed to create a scale ranging in possible scores from 2 to 10. Taking an average of the two items, or taking the highest of the two, resulted in distributions with no evident differences from the one using the sum of the items. Therefore, to maintain consistency with previous research and allow for greater variance, I kept the scale as a sum of the two items. Internal reliability for the scale at pretest was sufficient, with a Cronbach’s alpha of .758. Inspection of the distribution revealed no serious divergence from normality; the mean was 7.26 and standard deviation was 2.06.

**Contextual Stressors**

The Contextual Stressors index (Table 5.7) was modeled on the Social Readjustment Rating Scale (Holmes & Rahe, 1967), which listed specific events or situations in an individual’s life and asked whether that situation was extant (e.g., please indicate if you have recently been married). What counts as a common and stressful life event seems to vary by age and developmental status, however. Therefore, the Contextual Stressors index used items that were gleaned from pilot studies of emerging adults who reported reasons why they felt stressed or wanted to take the Design Your Life course on their written class applications. As such, it is a potential contribution of this research to the field and may be used in the future to assess occurrence of career-related stressful events and situations in emerging adults.
Table 5.7. *Subscales and items within the Career Stressors index*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Items (yes / no response option)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Career</strong></td>
<td>My family frequently asks what I am planning to do after college.</td>
</tr>
<tr>
<td></td>
<td>Graduation is coming up soon.</td>
</tr>
<tr>
<td></td>
<td>I or someone close to me is facing significant financial difficulties.</td>
</tr>
<tr>
<td></td>
<td>I have many decisions to make related to my career.</td>
</tr>
<tr>
<td></td>
<td>I have many decisions to make about my life overall.</td>
</tr>
<tr>
<td></td>
<td>The job market right now is really tough.</td>
</tr>
<tr>
<td></td>
<td>Unemployment is high right now.</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>Most of my friends have made decisions about their careers.</td>
</tr>
<tr>
<td></td>
<td>Most of my friends have already gotten jobs or job offers.</td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td>I or someone close to me is facing a significant health problem.</td>
</tr>
</tbody>
</table>

There were ten situations on the Contextual Stressors index. They referenced multiple domains: friends and family, graduation, objective life challenges such as medical and financial difficulties, perceived need to make significant decisions, and the general societal job/employment outlook. Participants indicated whether the situation was extant, using binary (yes / no) answer choices. Given the varied nature of topics on the index, a cluster analysis was performed to group conceptually distant items into subscales. The hierarchical cluster analysis indicated an initial split between general career items in the larger branch (seven items), and social and health-related items in the smaller (three items), as shown in Figure 5.2. Given the similarity of the two items relating to friends’ career status, they were both excluded from the general career stressors scale. The health stressor item was treated as a stand-alone question due to its conceptual and empirical uniqueness. For the main Contextual Stressors index, there were a final seven items, with a pretest mean of 5.50 ($SD = 1.45$).
Career-related Negative and Positive Affect

Two measures of well-being were used initially, negative and positive affect, but were eventually combined into a single negatively-valenced scale (items listed in Table 5.8). The measures of mental health combined selected items from the Career Decision Comfort scale (Jones, 1989), the Center for Epidemiologic Studies Depression Scale (CES-D, Radloff, 1977) and the Perceived Stress Scale (PSS, Cohen, Kamarck & Mermelstein, 1983). For each item, specific wording was adapted to relate the scale explicitly to individual career and professional future. The Career Decision Comfort Scale has two items: feeling at ease and comfortable, and not feeling worried. The CDCS items were measured as Likert scales from 1 (Strongly Disagree) to 5 (Strongly Agree).
From the CES-D, I selected seven items out of twenty (two positively worded, five negatively worded) that were most relevant to career-related emotional experience. From the PSS, I chose four items out of ten (three negatively worded, one positively worded). The CES-D and PSS items were asked as a frequency report for the last month, with a Likert scale of 1 (“Less than once in the last month”) to 6 (“Daily during the last month”). For the Negative Affect Scale, I created two items to address avoidance and procrastination, which many students in previous Design Your Life classes had reported as indicative of their negative career thoughts and experiences. Internal reliability, before combination, was .87 for the Negative Affect scale and .83 for the Positive Affect scale.
Table 5.8. *Wording and sources of items on the Negative Affect Scale (Positive Affect items reverse-coded)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>I felt depressed about my career and future.</td>
<td>Center for Epidemiologic Studies Depression Scale</td>
</tr>
<tr>
<td>My sleep was restless when I thought about my career and future.</td>
<td></td>
</tr>
<tr>
<td>I talked less than usual about my career and future.</td>
<td></td>
</tr>
<tr>
<td>I had crying spells when I thought about my career and future.</td>
<td></td>
</tr>
<tr>
<td>I felt sad about my career and future.</td>
<td></td>
</tr>
<tr>
<td>I felt hopeful about my career and future.*</td>
<td></td>
</tr>
<tr>
<td>I was happy about my career and future.*</td>
<td></td>
</tr>
<tr>
<td>I am not worried about my career choice.*</td>
<td>Career Decision Comfort Scale</td>
</tr>
<tr>
<td>I feel at ease and comfortable with my vocational decision. (reverse-coded)</td>
<td></td>
</tr>
<tr>
<td>I felt unable to control my career and future.</td>
<td>Perceived Stress Scale</td>
</tr>
<tr>
<td>I felt nervous and stressed about my career and future.</td>
<td></td>
</tr>
<tr>
<td>I felt that difficulties related to my career and future were</td>
<td></td>
</tr>
<tr>
<td>piling up so high that I could not overcome them.</td>
<td></td>
</tr>
<tr>
<td>I felt confident about my ability to handle problems related to</td>
<td></td>
</tr>
<tr>
<td>my career and future.*</td>
<td></td>
</tr>
<tr>
<td>I avoided thinking about my career and future.</td>
<td>Created for this study</td>
</tr>
<tr>
<td>I procrastinated on tasks related to planning my career and</td>
<td></td>
</tr>
<tr>
<td>future.</td>
<td></td>
</tr>
</tbody>
</table>

*Reverse-coded.*

Career Development Agency: Self-efficacy

Career development agency was assessed using two of its major components: self-efficacy and beliefs. The Career Development Self-Efficacy scale was developed from the Career Decision-Making Self-Efficacy scale, as described in the previous chapter. Its 16 original items all began with the prompt, “How sure are you that you could…” . The items referred to a range of career development activities. These included
gathering information about the world of work and oneself (e.g. networking, taking self-assessments), making plans and taking construction action (e.g. selecting a job to try out of several options), and coping with challenges (e.g. change jobs if you are unhappy). Responses were on a Likert scale from 1 (“Very unsure”) to 5 (“Very sure”) with 3 as the “Neutral” option. Items were presented together in a single block; however, the survey software randomized order.

Based on factor analyses reported below, the self-efficacy scale also included on reverse-coded item from the original dysfunctional beliefs scale, “Given my experience and education to date, only a few careers paths are practical for me”. This item’s response set was from 1 (“Strongly disagree”) to 5 (“Strongly agree”) with 3 as “Neither agree nor disagree”. The final possible score range for the scale was 17 to 85; the observed range at pretest was 21 to 75. With a sample size of 172, the distribution of scores was uni-modal and generally normal, with a mean of 60.66 (median: 61) and standard deviation of 12.38. The self-efficacy scale was conceptually unified and reliability for the 17-item scale was .93.

Dysfunctional Beliefs

As described in the previous chapter, the Dysfunctional Beliefs scale was developed from previous work on career-related thoughts, particularly the Career Beliefs Inventory (Krumboltz, 1994). Each item was a declarative statement, such as “If I make a good decision now, I will not have to change my career later in life” (all items in Table 5.9). Response options were on a Likert scale from 1 (“Strongly disagree”) to 5 (“Strongly agree”) with 3 as “Neither agree nor disagree”. Items were presented together as a single block (webpage), but the survey software randomized order for each participant. The final scale after factor analysis contained 10 items and its reliability (Cronbach’s alpha) was .76. The possible distribution of scores was 10 – 50 (actual range: 12 – 47). The sample distribution was not significantly different from a normal distribution, with a mean of 27.85 (median: 28) and standard deviation of 5.59.
Table 5.9. *Items on the final Dysfunctional Beliefs Scale*

<table>
<thead>
<tr>
<th>Final Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>I should be sure of my professional plans and goals before I do anything.</td>
</tr>
<tr>
<td>If I make a good decision now, I will not have to change my career later in life.</td>
</tr>
<tr>
<td>By the time I’m 25 years old, I will have figured out the questions that I’m struggling with now.</td>
</tr>
<tr>
<td>It is important that I make a serious, long-term decision about my career.</td>
</tr>
<tr>
<td>My career will be determined by the choices I make now.</td>
</tr>
<tr>
<td>College graduates should know what they want to do with their lives.</td>
</tr>
<tr>
<td>If I make a mistake in choosing an occupation, it will have serious long-term consequences.</td>
</tr>
<tr>
<td>Trying out different occupations is uninteresting.</td>
</tr>
<tr>
<td>Trying out different occupations is frightening.</td>
</tr>
<tr>
<td>My job/career should be the most important part of my life.</td>
</tr>
</tbody>
</table>

**Career Development Behaviors**

Participants reported the frequency of engaging in productive career-related behaviors. The specific items are listed in Table 5.10, and include a range of real-life behaviors, from doing Internet research on jobs to actually applying for a job or internship. For each of the twelve activities, participants indicated how often they had done the activity within the last academic quarter (approximately ten weeks). The response options were: “Not in the last quarter”, “Once”, “Twice”, or “Three or more times”. The final scale had ten items and a reliability of .74 with a sample of 172 participants. The possible distribution of scores was 0 to 30 (actual range: 0 to 26). The mean was 11.55 (median: 11) and standard deviation was 6.44.
Table 5.10. *Items within the Career Development Behaviors Scale*

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Gathering Information</em></td>
<td>Conducted an informational interview</td>
</tr>
<tr>
<td></td>
<td>Learned about careers or occupations (e.g., through Internet research)</td>
</tr>
<tr>
<td></td>
<td>Used the Career Development Center’s resources (e.g., job guides or the Career library)</td>
</tr>
<tr>
<td></td>
<td>Met with a career counselor</td>
</tr>
<tr>
<td><em>Understanding Oneself</em></td>
<td>Created a personal or professional 5-year plan</td>
</tr>
<tr>
<td></td>
<td>Did a self-assessment (such as a personality or career interest test)</td>
</tr>
<tr>
<td></td>
<td>Wrote in a journal, meditated or did other forms of self-reflection*</td>
</tr>
<tr>
<td><em>Using Social Resources</em></td>
<td>Found or met with a professional mentor</td>
</tr>
<tr>
<td></td>
<td>Networked (e.g. emailed a contact, met new people who could help you professionally)</td>
</tr>
<tr>
<td><em>Gaining Experience</em></td>
<td>Volunteered in a field of occupational interest*</td>
</tr>
<tr>
<td></td>
<td>Wrote, practiced or gave an elevator speech</td>
</tr>
<tr>
<td></td>
<td>Applied for an internship or job</td>
</tr>
</tbody>
</table>

*These items were removed from the final scale.*

**Learning Measure**

As a major component of the class was a curriculum which had never been applied to career development before – design thinking – a learning measure related to this curriculum was given to all participants at posttest only. As no standard evaluations of design thinking exist, I designed the measure specifically for this study and focused on one of the foundational skills of the problem-solving process: ideation, or the capacity to produce many and novel ideas related to a given task or question (sometime referred to as brainstorming).

The ideation learning measure consisted of three separate web pages, which appeared after all of the scale items had been administered, but before demographic and
personal questions. First, participants saw a page with instructions and a photo (see Appendix C). The instructions read:

“Imagine that you are a product designer. Your company wants to design new products for beach-goers, and have given you a photo of their potential customers to get you started. Spend some time examining this picture, in preparation for designing new products for beach-goers. Go on to the next page when you are ready.”

The photo showed two young women in the foreground, carrying many potentially beach-related objects (e.g., a cooler), and the background included several natural features (e.g., trees and rocks) and two other people. When they went to the following page (they could take as much time as they wished to do so), participants were asked to write down everything they could remember about the photo without going back to look at it. They were given a large free-response box in which to type, which expanded to fit any length of text entry. Next, on a new webpage, participants were asked to write down as many ideas they had for new products for people going to the beach, even those that seemed weird or impractical. Participants were told that they could write as much as they wanted, and spend as long as they wanted, and that the free-response box would expand to fit their response as necessary. On this final page, the photo was presented again in order to separate effects of memory and idea generation.

Responses for these two items were coded quantitatively for three primary outcomes. First, the memory question was coded for total number of correctly remembered, distinct items from the photograph. For example, the picture included two girls in the foreground and multiple natural features, such as trees and rocks. A response of “girls” was coded as one correctly remembered item, “a girl on the left and one on the right” was coded as two correctly remembered items, and “a bicycle” was not counted because it did not actually appear in the photograph. Then, the new products question was coded for idea generation, that is, the total number products that the participant came up
with, and for novel ideas, defined as the total number of products that were novel for the given situation.

As novelty has different definitions depending on the goal of the research, the coders agreed upon the rule that a product was novel either if it currently did not exist, or if it existed but was not typically found in the context of the question, beach-going. For example, a sand-proof robot to carry one’s beach items is a novel product because it does not currently exist. On the other hand, a moving walkway is an extant product, however, it is not commonly used in a beach setting. Therefore, a moving walkway in this context is considered a novel product. Many of the products coded as novel were combinations of existing products; for example, a beach chair that had an umbrella built in. As many of the ideas participants came up with were somewhat vague, coders used the rule that an ambiguous item, such as, “something to protect you from the sun,” counted as an item for idea generation, but did not count for novel ideas unless it identified a new need. For example, “something to help you grow a new arm,” is ambiguous, but it is creative because having a new arm would help you carry more beach gear.

During the coding process, both coders were blind to the membership of each participant in class, waitlist or non-applicant condition. The second coder was also blind to the research hypotheses. To establish reliability, a grounded, convergent coding process was used (Strauss & Corbin, 1990; Boeije, 2002). Difficult cases (approximately 15%) were discussed until the coders agreed on the correct code and a procedure for similar cases. When similar cases existed, both coders reviewed their previous codes and made changes as required by the convergent process, until 100% agreement was reached.

Demographic and Personal Data

Demographic and personal data including age, gender, and location of high school were collected to understand the general characteristics of the sample. Academic variables were also considered, including year in college, major, self-reported GPA and coursework related to the intervention (design or design thinking curriculum). Personal variables included participation in varsity athletics and frequency of volunteering or
community service, as well as a number of activities related to career development. These activities were: having had a 15- or 45-minute appointment with a university career counselor, signing up for the Alumni Mentoring program, or having other interactions with the Career Development Center on campus.

Summary

This chapter has described the empirical approach of the research, including research design, predictions, method, and in-depth analysis of the measures used. The approach was quasi-experimental, with three conditions compared at two different times, pre-treatment and post–treatment. The class condition was compared to a highly similar waitlist condition, and a more general non-applicant group that shared age and contextual factors with the class. Participants were all upperclassmen at Stanford University, with a variety of majors and ethnicities. Both men and women were studied, however, there were more women than men in the waitlist and non-applicant conditions. The primary data collection instrument was an online questionnaire. As many of the measures were used for the first time in this study, detailed information about reliability and validity was presented in this chapter. Internal reliability for all of the scales used was satisfactory. Furthermore, factor analyses allowed several of the scales to be shortened and simplified, by removing items that did not align with the desired construct. In the case of negative and positive affect, the primary outcome measures, it was possible to combine all of the relevant items into a single scale focusing on negative affect. In the next chapter, I will use the revised measures to present data and results for each of my predictions.
CHAPTER 6. EFFECTS OF TREATMENT

OVERVIEW

In this chapter, I evaluate treatment effects, overall and by subgroup, and then consider potential explanations for treatment outcomes. To establish the legitimacy of the study design, which compares the treatment and non-treatment conditions, I begin by analyzing differences by condition at pretest. To review, the study included three conditions: the class (treatment), the waitlisted participants, who applied to the class but did not get in due to the enrollment cap (control), and the comparison group, made up of upper-class undergraduates, drawn from the general student body, who had never applied for the treatment class. In the discussion below, I refer to these conditions as “class”, “waitlist”, and “non-applicants”.

For the main analysis of treatment effects, I describe an approach using multivariate analysis of variance with repeated measures on career uncertainty, career development self-efficacy, dysfunctional beliefs, contextual stressors, and career-related negative affect. A secondary analysis used median splits to create subgroups within the sample based on career uncertainty, self-efficacy and dysfunctional beliefs. These within-subjects analyses used only those participants who completed both the pretest and posttest. To offer potential explanations for the outcomes of treatment, I also report an analysis of variance test using repeated measures on the instructional outcomes of the treatment, career development behaviors. Additionally, differences by condition on posttest-only learning measures (related to design thinking) were investigated using a between-subjects multivariate analysis of variance.

PRETEST DIFFERENCES BY CONDITION AND ATTRITION

Before considering the effects of the intervention on the class, waitlist and non-applicant conditions, I looked at differences by condition at pretest to address equivalence of samples. Given that there was attrition from pretest to posttest, particularly in the non-applicant condition, I also analyzed pretest data for differences by attrition (completers and non-completers). It is useful to note that in this study, non-
completers in the class did not drop out of the treatment; they simply did not complete the posttest. Results indicated that there were no significant differences by condition or attrition except in two expected ways: class applicants had more career uncertainty and career-related affect than non-class applicants.

A between-subjects analysis of variance (ANOVA) tested the pre-existing equivalence of students in each condition and those who dropped out of the study. A separate ANOVA was conducted on each of the six pretested variables: career uncertainty, career development self-efficacy, dysfunctional beliefs, contextual stressors, career development behaviors, and negative affect. A univariate approach was used instead of a multivariate approach as a more conservative way to test for any potential differences by condition or attrition, which would affect the interpretation of the posttest results. The condition variable had three levels: class (course participants), waitlist (course applicants who were not admitted), and non-applicants. The attrition variable had two levels: completers and non-completers. As the study design assumed that the class and waitlist conditions were similar at pretest, the ANOVA included two planned contrasts by condition: class versus waitlist, and applicants (class and waitlist combined) versus non-applicants. These contrasts were included a priori because the instructors and I believed that all class applicants, whether they were admitted to the class or not, shared characteristics based on their demonstrated active interest in exploring their own career and life development process. In contrast, we felt that non-applicants may have had a different psychological profile. In total, the analyses involved six 3 (condition) x 2 (attrition) ANOVAs.

For the condition factor, there was only one statistically significant main effect at pretest: negative affect, $F(2, 166) = 3.31, MSE = 163.75, p = .04$. The main effect of condition also neared statistical significance for career uncertainty, $F(2, 169) = 3.04, MSE = 4.02, p = .05$. For the other four variables (career development self-efficacy, dysfunctional beliefs, contextual stressors, and career development behaviors) there were no overall differences by condition at pretest (all $ps >.09$).
Neither the main effect of attrition nor the interaction between condition and attrition reached statistical significance for any of the pretest variables (all $p > .13$). Given the large number of tests and their lack of statistical significance, all $F$ values are not reported. Participants at pretest who did not take the posttest were not significantly different from those who did complete the study; furthermore, the non-completers did not differ by condition across the pretest variables.

Looking more closely at the differences in condition for negative affect and career uncertainty, the planned contrasts showed significant differences only for the non-applicant condition versus the class and waitlist conditions combined ($p = .01$ for negative affect and $p = .02$ for career uncertainty). The class and waitlist conditions combined had a significantly higher mean for negative affect ($M = 41.13, SD = 13.68$) than the non-applicant condition ($M = 37.77, SD = 12.12$). The class and waitlist conditions also had a significantly greater combined mean for career uncertainty ($M = 5.29, SD = 2.06$) than the non-applicant condition ($M = 4.28, SD = 1.95$). The class and waitlist conditions were not significantly different from each other in negative affect or career uncertainty at pretest ($p > .68$ for both).

In sum, the analysis of differences at pretest by condition and attrition showed that students who applied for the “Design Your Life” class tended to have, on average, higher self-reported career uncertainty and higher career related negative affect than their classmates who did not apply for the class but were part of the same general student body. Class applicants were not, however, different from their peers in career development self-efficacy, career related dysfunctional beliefs, contextual stressors, or career development behaviors. Another positive outcome of this statistical analysis is that although there was attrition in the sample, pretest participants who dropped out were not different on any of the variables tested from those participants who stayed in the study and completed the posttest. Therefore, any differences at posttest cannot be attributed to self-selection by the completers. With these findings established, we can move on to consider treatment effects, as evidenced in changes by condition from pretest to posttest.
OUTCOMES OF TREATMENT

A multivariate analysis of variance (MANOVA) with repeated measures was performed to investigate differences by condition, changes from pretest to posttest, and differences in change over time by condition across five dependent variables. The between-subjects independent variable was condition: class, waitlist, and non-applicant. The within-subjects independent variable was time: pretest and posttest. The dependent variables were career uncertainty, career development self-efficacy, dysfunctional beliefs, contextual stressors, and negative affect. Although career development behaviors were measured at pretest and posttest, they were not included in the MANOVA because this variable was manipulated by the treatment and it is possible that large effects due to treatment on this one variable could result in a spurious multivariate effect of condition. To avoid this, I tested career development behaviors as a manipulation check in a later statistical test (reported in the next Results section). All told, the design was a 3 (condition) x 2 (time) multivariate analysis on five dependent variables. Results indicate that the differences due to treatment were that class participants’ career development self-efficacy increased and their dysfunctional beliefs stayed constant, while the other conditions’ average levels increased over time.

There was a statistically significant main effect of time on the combined dependent variables, \( F(5, 88) = 8.16, p < .001 \). As in the pretest analysis, there was no statistically significant main effect of condition, \( F(10, 176) = .76, p = .665 \). Importantly, the interaction between time and condition on the dependent variables considered together was statistically significant, \( F(10, 176) = 2.93, p = .002 \). Considering the main effect and interaction together, the main effect of time was driven by the changes over time that occurred differentially across conditions, as demonstrated below.

Examining each of the dependent variables for main effects of time, self-efficacy and dysfunctional beliefs increased from pretest to posttest, negative affect decreased slightly, and career uncertainty and contextual stressors did not change significantly (Table 6.1 gives the means and standard deviations at pretest and posttest for all five
variables). Using a Bonferroni adjusted alpha level of .01, the dependent variables that reached statistical significance for an effect of time were self-efficacy, $F(1, 92) = 9.98, p = .002$, and dysfunctional beliefs, $F(1, 92) = 10.57, p = .002$. There was also a trend towards statistical significance for the effect of time on negative affect, $F(1, 92) = 3.58, p = .062$. For career uncertainty and contextual stressors, the effect of time was not statistically significant (both $ps > .11$).

Table 6.1. *Means and standard deviations for dependent variables at pretest and posttest, all conditions (n = 104)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M (SD)</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career uncertainty</td>
<td>4.74 (2.06)</td>
<td>4.79 (2.04)</td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>60.66 (12.38)</td>
<td>64.11* (10.89)</td>
<td></td>
</tr>
<tr>
<td>Dysfunctional Beliefs</td>
<td>27.85 (5.59)</td>
<td>28.57* (6.40)</td>
<td></td>
</tr>
<tr>
<td>Contextual Stressors</td>
<td>5.50 (1.45)</td>
<td>5.49 (1.43)</td>
<td></td>
</tr>
<tr>
<td>Negative Affect</td>
<td>24.02 (12.81)</td>
<td>23.16 (12.81)</td>
<td></td>
</tr>
</tbody>
</table>

* $p < .01$.

Of more interest are the interactions between time and condition on changes between pretest and posttest for each dependent variable. The interaction was significant for dysfunctional beliefs, $F(2, 92) = 9.46, p < .001$, when using a Bonferroni adjusted alpha level of .01. At this more stringent level of alpha, used to reduce the possibility of a false positive result, career development self-efficacy also approached statistical significance for the interaction, $F(2, 92) = 4.73, p = .011$. The other variables did not show a significant interaction for time and condition (career uncertainty, contextual stressors, and negative affect; $ps > .34$).

Inspection of the means by condition showed that for dysfunctional beliefs, the waitlist and non-applicant conditions increased from pretest to posttest, while the class condition decreased slightly (Figure 6.1). For self-efficacy, the class condition increased from pretest to posttest, while the waitlist and non-applicant conditions experienced very
small declines in self-efficacy over time (Figure 6.2). The observed effect of time on career development self-efficacy was driven by increases in self-efficacy in the class condition, while the effect of time on dysfunctional beliefs was driven by increases in dysfunctional beliefs in the waitlist and non-applicant conditions.

**Figure 6.1.** Means and standard errors for Dysfunctional Career Beliefs at pretest and posttest, by condition
As gender is known to play a role in reporting behavior, particularly in relation to emotion (Clancy & Gove, 1974), the analysis described above was repeated with gender crossed as a between-subjects factor. This was also important because the class had approximately equal numbers of men and women by design (51.0% women), but the waitlist and non-applicant conditions both had more female than male participants (67.6% and 60.4% women, respectively). Furthermore, pilot studies, as reported in Chapter 3, revealed potential gender differences in reporting, prevalence of negative affect, and effect of treatment. Adding gender as an independent factor, however, left several cells of the design with too few subjects for a valid analysis. Because the class versus non-class effects drove the differences of time by condition in the previous analysis, the waitlist and non-applicant conditions were combined. Thus, a 2 (class / non-class) x 2 (time) x 2 (gender) repeated measures multivariate analysis of variance (MANOVA) was performed. The dependent variables were the same: career uncertainty,
career development self-efficacy, dysfunctional beliefs, contextual stressors, and negative affect. The results showed that there was an overall effect of gender such that women reported higher negative affect and more contextual stressors than men, but this did not interact with condition or time.

As before, the multivariate test showed a main effect of time, $F(5, 87) = 5.27, p < .001$, and an interaction between time and condition, $F(5, 87) = 2.88, p = .019$. Again, there was no effect of condition on the five dependent variables considered together, $F(5, 87) = 0.478, p = .792$; there was, however, an overall effect of gender, $F(5, 87) = 2.52, p = .035$. The interaction between gender and condition did not reach significance, $F(5, 87) = 1.08, p = .375$. Likewise, the interaction between gender and time was not significant, $F(5, 87) = 0.32, p = .898$. Also non-significant was the three-way interaction of gender, condition, and time, $F(5, 87) = 1.38, p = .239$. On the whole, the second MANOVA repeated the results of the previous one, while suggesting a need to further examine potential effects of gender on the dependent variables.

With a significant main effect of gender across the five dependent variables, the next step was to consider each dependent variable separately in relation to gender. The only main effect that reached significance, using a Bonferroni adjusted alpha level of .01, was negative affect, $F(1, 91) = 7.90, p = .006$. The difference for contextual stressors trended towards significance, $F(1, 91) = 4.00, p = .049$. For the other three dependent variables, there was no indication of significant differences by gender (all $p$s > .18). The means for men and women showed that at both pretest and posttest, women reported greater career-related negative affect and more contextual stressors than men did (Table 6.2).
Table 6.2. Means and standard deviations for negative affect and contextual stressors at pretest and posttest, by gender ($n_{Men} = 35$, $n_{Women} = 60$)

<table>
<thead>
<tr>
<th></th>
<th>Mean $(SD)$</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td></td>
</tr>
<tr>
<td><strong>Negative Affect</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>20.54 (12.15)</td>
<td>17.46 (11.44)</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>27.12 (12.63)</td>
<td>25.87 (11.92)</td>
<td></td>
</tr>
<tr>
<td><strong>Contextual Stressors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>5.26 (1.67)</td>
<td>5.17 (1.71)</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>5.82 (1.08)</td>
<td>5.68 (1.17)</td>
<td></td>
</tr>
</tbody>
</table>

**Effects of Year in College**

A final potential variable of interest in relation to treatment effects is year in college: participants were mostly seniors, but some were juniors. This differed somewhat by group, with juniors making up 25.5% of the class (by instructor design), 29.4% of waitlist, and 45.8% of non-applicants. Even one year of difference may influence outcomes related to career development, as seniors may feel more pressure about their upcoming transition. There were not enough juniors in the sample (particularly the class) to run analyses with any other variable, so I performed a two-way (junior / senior) MANOVA with repeated measures for each of the five dependent variables, as a check for potential effects of year.

The main effect of year reached statistical significance, $F(5, 89) = 2.60, p = .031$, as did the main effect of time, $F(5, 89) = 4.27, p = .002$. The interaction of year and time was not statistically significant, $F(5, 89) = 1.06, p = .386$. Examining the effects of year on each dependent variable separately, juniors reported fewer contextual stressors and higher dysfunctional beliefs than seniors at both occasions (Table 5.3). This difference was statistically significant for contextual stressors, $F(1, 93) = 5.72, p = .019$. The difference by year for dysfunctional beliefs neared significance, $F(1, 93) = 3.37, p = .070$. For all other variables there were no significant differences by year (all $p$s > .16). As for the main effect of time, these results repeat those of the previous MANOVAs.
reported above. The fact that the interaction of time and year was not significant justifies the conclusion that while juniors may have differed from seniors at pretest in a few ways, their change over time was similar to that of seniors, and treatment differences by year are unlikely.

Table 6.3. Means and standard deviations for Contextual Stressors and Dysfunctional Beliefs at pretest and posttest, by year ($n_{\text{Junior}} = 25$, $n_{\text{Senior}} = 70$)

<table>
<thead>
<tr>
<th></th>
<th>Pretest Mean (SD)</th>
<th>Posttest Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Juniors</td>
<td>Seniors</td>
</tr>
<tr>
<td>Contextual Stressors</td>
<td>5.07 (1.63)</td>
<td>5.76 (1.26)</td>
</tr>
<tr>
<td>Dysfunctional Beliefs</td>
<td>28.45 (5.69)</td>
<td>27.50 (5.53)</td>
</tr>
</tbody>
</table>

Treatment effects on negative affect

The dependent variable of greatest concern in this study was negative affect, and according to the multivariate analyses reported above, there was a trend for negative affect to decline over time. To more closely examine any treatment effect for this variable, three post hoc paired samples t-tests were conducted on negative affect, with pretest and posttest scores paired for each condition separately. Although none of these t-tests reached the statistical significance, using a Bonferroni adjusted alpha level .017 (due to the number of tests), there was a trend for the class’s negative affect to decline from pretest ($M = 23.48$, $SD = 13.07$) to posttest ($M = 20.55$, $SD = 11.67$), $t (41) = 2.00$, $p = .052$, as shown in Figure 6.3. The t-tests were not significant for the waitlist condition, $t (18) = 1.03$, $p = .318$, or the non-applicant condition, $t (38) = 0.15$, $p = .881$. While the class condition did not show a significantly greater decline in negative affect than non-class conditions, they did report a near-significant decline in negative affect from pretest to posttest, when considered in isolation.
Figure 6.3. Means and standard errors for Career-related Negative Affect at pretest and posttest, by condition

Treatment effects on individual differences

As a second, rough approach to uncovering potential effects of treatment on well-being, I divided participants into high-low subgroups (using median splits, described below) and looked for differential outcomes in negative affect. Though median splits are an artificial way to create groupings based on continuous variables, they allow the data to speak to the question of which subgroups of participants (if any) were most likely to experience improvement in well-being (as measured by negative affect) over the time period studied. The four two-level factors tested through this approach were condition (class/non-class), career uncertainty (high/low), career development self-efficacy (high/low), career-related dysfunctional beliefs (high/low), and gender (male/female). These variables were selected because they showed effects or near effects in previous analyses. Although the condition variable actually had three levels (class / waitlist / non-applicant), the small number of participants in the waitlist condition and the hypothesis of a treatment effect argued for a two-level split on condition for this analysis. The results
included two near-significant main effects: men tended to improve on negative affect while women did not, and class participants improved more on negative affect than non-class participants.

To create categorical factors for career uncertainty, career development self-efficacy, career-related dysfunctional beliefs and negative affect at pretest, I divided participants who took both the pretest and posttest ($n = 97$) into low and high groups using a median split for each variable at pretest. The median split technique assigns cases below that variable’s median to the “low” group and those above the median to the “high” group. Although the median is theoretically the value with an equal number of cases below and above it, an exactly even split is often impossible. Those on the median were assigned to either the low or high group by the statistical program in order to balance the two groups as evenly as possible. Table 5.4 gives the median for each variable and the number of cases sorted into each group (low and high). The total number of participants varies because some participants did not complete all items (e.g., four participants answered all questions for the career uncertainty scale, but did not complete all items for the career development self-efficacy, resulting in a sample size of 104 for career uncertainty and 100 for career development self-efficacy).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Median Split</th>
<th>Median</th>
<th>Total N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (Low)</td>
<td>N (High)</td>
<td></td>
</tr>
<tr>
<td>Career uncertainty</td>
<td>5</td>
<td>45</td>
<td>59</td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>61</td>
<td>48</td>
<td>52</td>
</tr>
<tr>
<td>Career-related dysfunctional beliefs</td>
<td>28</td>
<td>54</td>
<td>49</td>
</tr>
<tr>
<td>Negative affect</td>
<td>22</td>
<td>52</td>
<td>50</td>
</tr>
</tbody>
</table>

For the dependent variable, improvement scores for negative affect were used to allow for analysis of a single dependent variable (rather than a repeated measure with two observations), and to focus the investigation on change from pretest to posttest while
controlling for pretest differences. Normalization was performed to control for restriction of range effects, as participants close to the edge of the scale for a given variable at pretest could not show large changes, yet could conceivably change greatly in relation to how much change was possible for them. To compute the normalized gain score for negative affect, each participant’s gain in negative affect was divided by his or her own total possible gain, i.e., \((\text{Pre} – \text{Post}) / (\text{Max} – \text{Pre})\), where Pre is the pretest score, Post is the posttest score, and Max is the maximum possible score on the measure. For variables for which the desired outcome is reduction rather than increase, the equation for the normalized gain score is: \((\text{Pre} – \text{Post}) / (\text{Pre} – \text{Min})\) with Min being the minimum possible score. For these types of variables, “gain” is actually defined as decrease over time, so I refer to this as an “improvement score”.

After computing the improvement scores for negative affect, I found three outlying cases that were more than three standard deviations below the overall mean. Closer examination revealed that in all three cases, the large negative improvement score was a result of an extremely low pretest negative affect score and a small absolute increase, which normalization emphasizes. For example, a participant starting with a score of 10 out of 100 on the negative affect scale has very low negative affect. If her score increased (more negative affect) by only five units, the absolute value of the increase is small, but is computed as a 50% increase, which is very large. Yet for someone who started at 50, a much higher level of negative affect, an increase of five units would only be a 10% gain. Given the very low initial scores for these three outliers, it seemed plausible that their increases indicate regression towards the mean and minimal increases in negative affect, rather than very large increases in negative affect. As the number of participants was small, however, the outliers’ large negative values disproportionately skewed the mean. To address the negative skew in the improvement score for negative affect, I first made all values positive by shifting the distribution by a constant, then reflected the distribution (to change the skew to positive) and used an inverse transformation to bring in the tail. Table 6.5 shows how the minimum, zero and maximum values changed as a result of each computational step. The resulting distribution was sufficiently similar to a normal distribution, with a range of .21 to 1.00,
mean of .52 and standard deviation of .12. For this distribution, the “zero” value, representing no change from pretest to posttest, is 0.5, with lower values indicating worsening (increase of negative affect over time) and higher values indicating improvement (decrease over time).

Table 6.5. Normalization process for negative affect improvement variable

<table>
<thead>
<tr>
<th>Step</th>
<th>Computation</th>
<th>Equation</th>
<th>Max decrease</th>
<th>No change</th>
<th>Max increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normalized improvement</td>
<td>(Pre – Post) / Pre</td>
<td>-2.8</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Shift by constant</td>
<td>Score + Min.</td>
<td>0</td>
<td>2.8</td>
<td>3.8</td>
</tr>
<tr>
<td>3</td>
<td>Reflection</td>
<td>(Max. + 1) – Score</td>
<td>4.8</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Inverse transformation</td>
<td>1 / Score</td>
<td>0.21</td>
<td>0.5</td>
<td>1</td>
</tr>
</tbody>
</table>

For the analyses by subgroup, I ran a univariate ANOVA with normalized negative affect improvement as the dependent variable. As a full factorial model with all independent variables of interest would result in cells with too few cases, and because interactions by condition and career uncertainty were the priority, I specified a custom *a priori* model. The custom model tested the main effects of five, two-level factors (condition, career uncertainty, self-efficacy, dysfunctional beliefs, and gender), and the four two-way interactions of condition with the other factors. There were statistical trends (*p* < .10) for gender and condition, but no other significant results (all *ps* > .13).

For the near-significant main effect of gender, inspection of the means showed that men, on average, tended to improve in negative affect over time (*M* = .55, *SD* = .14), while the mean score for women did not change (*M* = .50, *SD* = .11), *F* (1, 83) = 4.38, *p* = .039. For the trend towards an effect of condition, the mean improvement in the class condition was slightly higher (*M* = .53, *SD* = .14) than the improvement in the other conditions (*M* = .51, *SD* = .11), though both improved, *F* (1, 83) = 2.86, *p* = .094. There were no significant interactions.
Given the possibility that the effect of treatment was being masked by the small gains in negative affect of the three pre-identified outliers, I also tried running the same custom ANOVA without these cases. Without the outliers, the non-transformed normalized improvement score for negative affect could be used as the dependent variable. This score was the original improvement score computed before the transformation (see Table 6.5), with an observed minimum of 2.8 and theoretical maximum of 1. For these scores, a zero value indicates no change, a positive value indicates improvement, and a negative value indicates worsening of negative affect over time. As there were many non-significant results, only those of interest are reported.

Means showed that negative affect for class participants improved over time, on average ($M = .14, SD = .36$) while non-class participants’ negative affect worsened (i.e., increased) on average ($M = -.05, SD = .45$), as illustrated in Figure 6.4. This difference by condition was significant, $F (1, 73) = 7.74, p = .007$. For the remaining main effects and all interactions, none of the $F$ values reached statistical significance (all $ps > .10$).

Figure 6.4. Means and standard errors for improvement in negative affect, by condition
The small numbers of cases in each subgroup, the removal of three outliers, and the artificiality of the median split technique means that these results should be taken as merely suggestive of possible ways to answer the question of who was most likely to experience improvement in well-being. With that caveat noted, the univariate analysis using median splits provides supports the hypothesis that class participants’ improvement in negative affect exceeded nonparticipants’.

EXPLANATIONS FOR TREATMENT EFFECTS

With the results of the previous analyses suggesting treatment effects on career development self-efficacy and career-related dysfunctional beliefs, as well as modest improvement in negative affect for class participants, the next set of analyses examine instructional effects of treatment that may help explain these differences. The class was designed to help participants by teaching specific career development behaviors and requiring students to perform them independently as homework. For example, as described in the previous chapter, students learned how to identify a person in occupational fields they were interested in, and conduct an informational interview with that person. Outside of class, they were also required to actually find and interview someone in a field they had identified as a potential career path. As a manipulation check, data on self-reported actual career development behaviors was collected at pretest and posttest.

A 3 (condition) x 2 (time) repeated measures analysis of variance (ANOVA) was performed with career development behaviors as the dependent variable. The main effect of time was not significant, $F(1, 95) = 1.27, MSE = 23.95, p = .262$. There was a main effect of condition, $F(2, 95) = 5.21, MSE = 46.57, p = .007$. The interaction between time and condition was also significant, $F(2, 95) = 10.61, p < .001$. As shown in Figure 6.5, class participants on average reported a large increase in their career development behaviors from pretest and posttest; in contrast, the same behaviors for the waitlist and non-applicant conditions decreased slightly over time. As the means for all conditions at pretest were similar, the main effect of condition appears to be driven by the interaction, specifically, the large increase reported by the class participants. The results of this
analysis showed that class participants were engaged in the course material and completed required assignments. Therefore, differences by condition may plausibly be attributed to different experiences between the conditions.

![Figure 6.5](image.png)

*Figure 6.5. Means and standard errors for career development behaviors at pretest and posttest, by condition*

Another aspect of the treatment, beyond required career development behaviors, was the design thinking curriculum. This curriculum was intended to challenge students’ typical approaches to problem-solving, and potentially affect their dysfunctional beliefs regarding career. For example, a key tenet of design thinking is that failure is an opportunity to learn rather than an unmitigated disaster. In the course, students were taught to explicitly apply design thinking to their questions about career development; early “failures” in one’s career can actually be reframed as positive experiences. Students were not expected to have experience with design thinking at pretest, so to avoid practice effects, the learning measure for design thinking was given to all conditions at posttest only. As described in the previous chapter, this measure included three variables: memory, idea generation, and novel ideas. The memory measure was intended to ensure equal engagement in the task, and was not expected to differ by condition. Idea generation and novel ideas, in contrast, are directly taught by the design thinking
curriculum. Idea generation is related to the engineering design technique of brainstorming or ideation: the number of different ideas a person can come up with regardless of their quality. Novel ideas are related the innovation side of problem-solving in engineering, which emphasizes “thinking outside of the box”. Novelty was defined as creative or unusual ideas for the given context, though the ideas did not have to be unique within the sample (i.e. more than one participant could get credit for the same novel idea). Two independent coders, blind to participant condition, coded the entire data set and used a grounded convergent process to achieve consensus (described in more detail in Chapter 4).

To test for differences by condition on the design learning measures, a three-way multivariate analysis of variance (MANOVA) was performed with memory, idea generation, and novel ideas as the dependent variables. Based on the a priori hypothesis of a treatment effect, the analysis included two planned contrasts: class and non-class (waitlist and non-applicants), and the two non-class conditions against each other. Box’s Test of Equality of Covariance Matrices was significant, Box’s M = 29.95, p = .005. Therefore, a more stringent significance level of .025 was used for the multivariate analysis reported below.

The main effect of condition reached statistical significance, $F(6, 198) = 2.67, p = .016$. Looking at each dependent variable separately, differences by condition were seen for idea generation, $F(2, 101) = 5.57, p = .005$, and for novel ideas, $F(2, 101) = 6.56, p = .002$. For memory, there was no effect of condition, $F(2, 101) = 1.83, p = .165$. Table 6.6 gives the means and standard deviations by condition for each of these variables. While the average class score for memory was only slightly greater than the other conditions’ average scores, the mean class scores for idea generation and novel ideas were significantly greater than the other conditions’ scores on those variables.
Table 6.6. Means and standard deviations for design thinking measures at posttest, by condition

<table>
<thead>
<tr>
<th></th>
<th>Class (n = 41)</th>
<th>Waitlist (n = 23)</th>
<th>Non-applicant (n = 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>9.78 (5.08)</td>
<td>7.52 (4.17)</td>
<td>8.55 (4.46)</td>
</tr>
<tr>
<td>Idea generation</td>
<td>4.32 (3.30)</td>
<td>2.26 (2.26)</td>
<td>2.78 (2.03)</td>
</tr>
<tr>
<td>Novel ideas</td>
<td>1.68 (1.88)</td>
<td>0.56 (0.95)</td>
<td>0.68 (1.14)</td>
</tr>
</tbody>
</table>

Results of the planned contrasts revealed that the differences between conditions only held for class versus non-class, for idea generation ($p = .001$) and novel ideas ($p < .001$). For memory, there was only a trend towards a significant difference between the class and non-class participants ($p = .069$). Comparing the effect sizes for each dependent variable shows that the effects of class versus non-class on idea generation (partial eta squared = .099) and novel ideas (partial eta squared = .115) were much greater than the effect of treatment on memory (partial eta squared = .035). There were no differences between the two non-class conditions, waitlist and non-applicant (all $p$s > .40).

I also ran a supporting analysis to further examine the difference between the class and non-class participants in ideation capacity, particularly for novel ideas. As the number of novel ideas that each participant produced was quite low on average, variance on this scale was also quite low. The large gap was between those who were able to come up with any novel ideas, and those who did not. Therefore, I created a binary variable to represent whether a participant had one or more novel idea in the ideation task. Table 6.7 shows these frequencies by condition. A chi-square test of independence showed that there was a relationship between condition and producing at least one novel idea, $\chi^2 (2, n = 105) = 11.68, p = .003$. Furthermore, collapsing the non-class conditions (waitlist and non-applicants) had the same outcome, with a larger proportion of students in the class producing novel ideas than those not in the class, $\chi^2 (1, n = 105) = 11.53, p < .001$. These results support the hypothesis that class participants learned and demonstrated novel ideation after completing the treatment course, while non-class participations did not.
Table 6.7. *Frequency of participants with novel ideas in design thinking (ideation) task, by condition*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of novel ideas</th>
<th>Zero</th>
<th>One or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class (n = 41)</td>
<td></td>
<td>13 (31.7%)</td>
<td>28 (68.3%)</td>
</tr>
<tr>
<td>Waitlist (n = 24)</td>
<td></td>
<td>15 (62.5%)</td>
<td>9 (37.5%)</td>
</tr>
<tr>
<td>Non-applicants (n = 40)</td>
<td></td>
<td>27 (67.5%)</td>
<td>13 (32.5%)</td>
</tr>
</tbody>
</table>

The planned contrasts suggest that class participants did learn from the design thinking curriculum, and as a result their performance was significantly better at the design thinking task than that of the waitlist and non-applicant participants. Because their memory scores were not much higher than non-class participants’ memory scores, this difference cannot be explained solely by effort or engagement. Furthermore, these differences cannot be explained by the possibility that class participants had more experience with design thinking than the non-class participants. Re-running this analysis with number of design courses taken as a covariate does not change the results. Therefore, differences in ideation, gained through the treatment, may be part of the explanation of the treatment’s effect on self-efficacy, dysfunctional beliefs and negative affect.

To directly investigate the potential connection between career development behaviors, design thinking, and the outcomes of interest – career development agency and well-being – a correlation analysis was performed. Career development behaviors were expected to relate to self-efficacy (as mastery experiences are a source of self-efficacy) and design thinking was hypothesized to relate to reduction in dysfunctional beliefs. Results of the analysis for the variables at posttest (Table 6.8) revealed a positive relationship between negative affect and dysfunctional beliefs, and an inverse relationship between negative affect and self-efficacy. Interestingly, although idea generation and novel ideas were strongly positively correlated, novel ideas were only
significantly associated with dysfunctional beliefs. Their relationship was negative such that more novel ideas predicted fewer dysfunctional beliefs.

Table 6.8. Correlations among selected variables at posttest, all conditions (n = 106)

<table>
<thead>
<tr>
<th></th>
<th>Ideation (Total)</th>
<th>Ideation (Novel only)</th>
<th>Self-efficacy</th>
<th>Dysfunctional beliefs</th>
<th>Negative affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career development</td>
<td>.14</td>
<td>.19</td>
<td>.33*</td>
<td>-.29*</td>
<td>-.05</td>
</tr>
<tr>
<td>behaviors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ideation (Total)</td>
<td>.57*</td>
<td>.13</td>
<td>-.14</td>
<td></td>
<td>-.16</td>
</tr>
<tr>
<td>Ideation (Novel only)</td>
<td>.10</td>
<td>-.30*</td>
<td>-.17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .01

Looking at the correlations among these variables for the class condition alone, only the relationship between total and novel ideation was significant (Table 6.9). However, the correlations for self-efficacy and career development behaviors, and novel ideation and dysfunctional beliefs, were in the expected direction (positive and negative, respectively). The failure of these associations to reach significance may reflect the smaller number of participants in this analysis, as well as the tendency of the class participants to have high scores (and less variability) on all of these measures.
Table 6.9. Correlations among selected variables at posttest, class condition only (n = 43)

<table>
<thead>
<tr>
<th></th>
<th>Ideation (Total)</th>
<th>Ideation (Novel only)</th>
<th>Self-efficacy</th>
<th>Dysfunctional beliefs</th>
<th>Negative affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career development behaviors</td>
<td>-0.05</td>
<td>0.12</td>
<td>0.18</td>
<td>-0.25</td>
<td>-0.01</td>
</tr>
<tr>
<td>Ideation (Total)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ideation (Novel only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p < .01

One possible explanation for the relationship between career development behaviors and self-efficacy found when considering all participants together, as well as the relationship between novel ideas and dysfunctional beliefs, is that various elements of the class affected each one of these components separately. In that case, their apparent associations would merely be coincidental, and would not strengthen a conceptual link between behaviors and self-efficacy, or design thinking (measured by novel ideas) and career-related dysfunctional beliefs. As correlations cannot show causality, this is an inherent problem with this analysis. If the class had separately affected each one of these variables, however, then the relationships should not hold for the non-class participants at posttest.

Examining the correlations for non-class participants only at posttest, we see that the relationships do hold (Table 6.10). For non-class participants, career development behaviors were positively related to career development self-efficacy. Furthermore, even for students who had not had any curriculum in design thinking, their rate of novel ideas was negatively correlated with their career-related dysfunctional beliefs. This is a remarkable outcome, because the design thinking learning task had nothing to do, conceptually, with career: it asked participants to think of new products for people going to the beach. Together, the correlation analyses support the hypothesis that the treatment’s impact on career development behaviors and ideation capacity was causally
related to the class participants’ increase in self-efficacy and decrease in career-related dysfunctional beliefs. Among non-class participants, self-efficacy was related to career development behaviors, and ideation capacity was (inversely) related to dysfunctional beliefs. Unlike the treatment condition, however, the students who were not in the class did not increase in self-efficacy or decrease in dysfunctional beliefs. A strong explanation for this difference is that they did not get the treatment; therefore, they did not have an external impetus (e.g. homework assignments) to engage in career development behaviors, nor did they have any reason to change their beliefs about career decision-making.

Table 6.10. *Correlations among selected variables at posttest, non-class condition only (n = 61)*

<table>
<thead>
<tr>
<th></th>
<th>Ideation (Total)</th>
<th>Ideation (Novel only)</th>
<th>Self-efficacy</th>
<th>Dysfunctional beliefs</th>
<th>Negative affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career development behaviors</td>
<td>.03</td>
<td>-.02</td>
<td>.26*</td>
<td>-.10</td>
<td>.07</td>
</tr>
<tr>
<td>Ideation (Total)</td>
<td>.21</td>
<td>.02</td>
<td>.08</td>
<td>-.09</td>
<td></td>
</tr>
<tr>
<td>Ideation (Novel only)</td>
<td>.16</td>
<td>-.40**</td>
<td>-.29*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* * p < .05; ** p < .01

*Alternative explanations for treatment differences*

An alternative explanation for the observed differences by condition is that class participants enjoyed the class, had positive feelings towards the instructors, and as a result, unconsciously inflated their posttest scores. This “halo effect” is similar to an explanation based on demand characteristics of the post-test instrument: class participants may have felt that they were expected to improve over time. Answers that indicated improvements could represent either a conscious misrepresentation to satisfy the expectation, or an unconscious belief in improvement that was, in fact, not there. The first response to this alternative explanation is that class participants only improved significantly on self-efficacy and dysfunctional beliefs. Had a halo effect or demand characteristics influenced them, they should have also improved on the other measures,
such as career uncertainty or even contextual stressors. As this did not happen, it does seem that the treatment had selective effects.

Adding to this line of reasoning is another source of data: a single question about non-career related stress that was included at pretest and posttest. This question was part of the contextual stressors index, and asked participants if they or anyone close to them were facing a significant health problem at the time. If yes, participants were then asked how well they were coping with this problem, on a scale of 1 (“Coping very well”) to 5 (“Not coping at all”). A small minority of participants at both pretest and posttest indicated that they or people close to them were facing significant health problems: 6 in the class and 16 in the non-class conditions. While having so few cases makes statistical tests less meaningful, examination of the means showed that at pretest, the average level of coping in the class ($M = 2.67, SD = .82$) was virtually identical to the average level of coping reported by non-class participants ($M = 2.63, SD = .81$). At posttest, coping for the class had gotten worse overall, ($M = 3.33, SD = .52$), while as a group, non-class participants reported better coping than they had before ($M = 2.31, SD = .79$). Although this finding would be more persuasive with a larger sample, it does provide some defense against the explanation of treatment effects as general positive feelings or response to demand characteristics.
Regardless of the effects of treatment, data from this study can shed light on the nature of career development agency, its relationship to career uncertainty, and how these constructs may relate to well-being in emerging adulthood. In the following section, I explore the data from pretest separately from the posttest, using the entire data set (not just those who completed pretest and posttest, as in the previous section). The main question I investigate using this data is, “How, and to what extent, do agency-related variables and career uncertainty predict career-related negative affect?” As discussed in Chapter 1, traditional approaches to this question focused on career uncertainty. To extend this literature, I start by looking at career uncertainty and negative affect, but simultaneously investigate the impact of career development agency, as measured by self-efficacy, dysfunctional beliefs and contextual stressors.

The first set of analyses is correlational, with the primary finding that career uncertainty was significantly related to negative affect only for students who were already concerned with career questions (class applicants). Furthermore, for all participants, career development self-efficacy was more strongly related to negative affect than career uncertainty, and dysfunctional beliefs and contextual stressors also had significant associations. These data also help demonstrate that the construct of career development agency is not subsumed by any one of its subcomponents.

Next, I use regression analyses to examine how career development agency and career uncertainty worked both individually and interactively to impact well-being. The first regression model shows that two contributors to career development agency, self-efficacy and contextual stressors, independently influenced negative affect, and that the variables associated with agency did not interact. The subsequent regression models also reveal different relationships between career development agency variables and negative affect for different groups of students. For those with demonstrated concern about career, the best predictors of negative affect were career uncertainty, self-efficacy, and contextual stressors. Among those students who did not apply for the treatment class,
career uncertainty alone was *not* predictive of negative affect, but gender, contextual stressors and the interaction of career uncertainty and self-efficacy predicted career-related negative affect well.

The chapter concludes by returning to the question of treatment effects, using the same correlation and regression analyses for the posttest data. The main finding is that the predictors of negative affect at posttest were largely the same as they had been at pretest, with one notable exception. For students in the class, career-related contextual stressors were positively related to negative affect at pretest, but this relationship was no longer significant at posttest. In other words, the treatment may have reduced the connection between contextual stressors and negative affect, such that stressors became not less real, but less stressful for the class participants. The results were not, however, unequivocally supportive of this hypothesis.

**CAREER UNCERTAINTY, AGENCY, AND NEGATIVE AFFECT**

The relationships among negative affect, career uncertainty, career development self-efficacy, dysfunctional beliefs, and contextual stressors were investigated with simple correlations (Table 7.1). In accordance with previous research, there was a small positive correlation between career uncertainty and career-related negative affect. There were also significant relationships between each of the career development agency variables and negative affect. For both dysfunctional beliefs and contextual stressors, the relationship with negative affect was small, but significant and positive. Higher levels of dysfunctional beliefs and contextual stressors were associated with higher levels of negative affect. For career development self-efficacy, however, the inverse relationship was large, with low levels of self-efficacy associated with higher levels of negative affect related to career.

Looking next at relationships that did not include negative affect (rows two to four in the table), there were two significant results. There was a small negative correlation between career uncertainty and self-efficacy, and a moderate negative correlation between career development self-efficacy and career-related dysfunctional beliefs.
beliefs. As expected, contextual stressors, which are considered mostly independent of psychological state, were not significantly associated with either of the other agency variables or career uncertainty at pre-test.

Table 7.1. Pretest correlations between negative affect, career uncertainty, and agency variables, all participants (N = 176)

<table>
<thead>
<tr>
<th></th>
<th>Career Development Agency</th>
<th>Career Development Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-efficacy</td>
<td>Dysfunctional beliefs</td>
</tr>
<tr>
<td>Negative affect</td>
<td>.22**</td>
<td>-.59**</td>
</tr>
<tr>
<td>Career uncertainty</td>
<td>-.18*</td>
<td>-.12</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td></td>
<td>-.32***</td>
</tr>
<tr>
<td>Dysfunctional beliefs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01; ***p < .001

As there are theoretical reasons to believe that class applications and non-applicants differmeaningfully, I also performed these correlation analyses separately for the two groups at pretest (Table 7.2). Results confirmed that the three career development agency variables were correlated with negative affect for both groups, and that the negative relationship between self-efficacy and dysfunctional beliefs held for both class applicants and non-applicants. There were also differences between groups. For the class applicants only, career uncertainty was positively correlated with negative affect, and negatively correlated with self-efficacy.
To summarize, the pretest data showed that while career uncertainty was related to negative affect, this only held for a subgroup of the participants – those who had indicated concern about their future lives and careers by applying to the course, “Design Your Life”. Furthermore, career uncertainty was not the only factor to consider – career development agency also mattered. Self-efficacy had the largest (inverse) correlation with negative affect, and dysfunctional beliefs and contextual stressors also had some positive association. It is important to note that the contributors to agency were not just measuring uncertainty in another way – their pair-wise correlations were either not significant or, when significant, small in magnitude and limited to a subgroup of participants (as in the case of career uncertainty and self-efficacy). Career development agency as a construct also seems to be more than just its most significant contributor, self-efficacy. Contextual stressors were independent of both self-efficacy and dysfunctional beliefs, and career development self-efficacy and dysfunctional beliefs were only moderately related to each other.
Though career uncertainty and career development agency appear to be empirically distinct contributors to negative affect, it is difficult to describe their relationships among them using simple correlations. To better understand these variables’ interactions with each other and their combined relationship to negative affect, the next stage of analysis employed hierarchical linear regression.

**Regression Analyses**

Based on the correlation analysis reported above, career uncertainty, self-efficacy, dysfunctional beliefs, and contextual stressors were expected to predict negative affect in a multiple linear regression model. Regression analysis, however, also offers the opportunity to analyze how each variable makes a difference in the presence of the other variables, and their interactions. As there were a large number of potential interaction terms, my first regression analysis focused on the possible interactions among the three career development agency variables only.

Hierarchical multiple regression was used to assess the ability of each of the career development agency variables, as well as their interactions, to predict levels of career-related negative affect. In hierarchical regression, different “blocks” or groups of variables are introduced into the equation sequentially, and the tests examine the extent to which each newly introduced block improves the fit of the model. The career development agency variables were entered as three blocks in the order of their correlation with negative affect. Block 1 was career development self-efficacy, Block 2 was contextual stressors, and Block 3 was dysfunctional beliefs. In the fourth block, the three interaction terms were entered together: self-efficacy by dysfunctional beliefs, self-efficacy by contextual stressors, and dysfunctional beliefs by contextual stressors. Table 7.3 gives the results of the analysis. The first model predicted 34% of the variance in negative affect, $F(1, 165) = 85.94, p < .001$. Adding dysfunctional beliefs increased the predictive power of the model to 45%, $F(2, 166) = 68.75, p < .00$, but the next two blocks did not.
These data suggest that career development self-efficacy and contextual stressors are important factors to consider when evaluating career-related well-being. Self-efficacy was inversely related and stressors were positively related to negative affect. Additionally, the analysis supports the theory that self-efficacy and stressors contribute independently to well-being. The lack of interactions among these variables implies that self-efficacy and stressors are subscales of agency, which can be added or considered together for a more holistic view.

To explore the possibility that career development agency could be simplified into a single sum across the three related variables, I repeated the regression analysis using this sum rather than each by itself. To compute the overall agency score, I first reversed the scores on the self-efficacy scale to match the valence of the other two scales, and then added their standardized (z) scores together. The resulting model explained 40% of the variance in negative affect. As the previous analysis, which treated the contributors to career development agency separately, was more predictive (45%), I continued to enter the agency variables separately for the subsequent analyses.
Table 7.3. Hierarchical regression analyses for predicting career-related negative affect at pretest, using career development agency variables only (N =166)

<table>
<thead>
<tr>
<th>Step and Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>F-chap</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R² = .34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>- .62</td>
<td>.07</td>
<td>- .59**</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R² = .44, ΔR² = .10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>- .58</td>
<td>.06</td>
<td>- .55**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contextual stressors</td>
<td>3.00</td>
<td>.51</td>
<td>.34**</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R² = .46, ΔR² = .02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>- .55</td>
<td>.06</td>
<td>- .52**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contextual stressors</td>
<td>2.91</td>
<td>.51</td>
<td>.33**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs</td>
<td>.23</td>
<td>.14</td>
<td>.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R² = .45, ΔR² = -.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>- .74</td>
<td>.28</td>
<td>- .70**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contextual stressors</td>
<td>.89</td>
<td>2.97</td>
<td>.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs</td>
<td>.00</td>
<td>.81</td>
<td>.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy x Dysfunctional beliefs</td>
<td>.03</td>
<td>.05</td>
<td>.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy x Stressors</td>
<td>-.01</td>
<td>.01</td>
<td>-.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs x Stressors</td>
<td>.10</td>
<td>.10</td>
<td>.26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** p < .01

To assess the ability of career development agency and career uncertainty to predict negative affect, when considered together, a second hierarchical multiple regression was performed. Gender was added here as it is a known predictor of negative affect. The first block included all three agency variables, career uncertainty and gender (women), entered simultaneously (forced entry method). The second block included each
of the two-way interactions of career uncertainty with self-efficacy, dysfunctional beliefs, contextual stressors and gender. The second block used stepwise regression because of the collinearity of the interaction terms with their constituent variables, and to maximize the test’s capacity to find any interaction with predictive power. In the stepwise method, the statistical program only enters those variables that increase the fit of the model, and excludes those that do not.

Table 7.4 shows that when career development agency, career uncertainty and gender were entered together in the first block (using forced or simultaneous entry), all but career uncertainty were significant predictors of negative affect. This first model explained 47% of the variance in negative affect, $F(6, 165) = 30.52$, $p < .001$. The stepwise entry of the interaction terms added two more steps in the regression, with the interaction of dysfunctional beliefs and career uncertainty entering in Step 2, and that of career uncertainty and gender entering in Step 3. The other interactions were excluded, indicating that they did not have a significant relationship with negative affect.

The final model predicted nearly fifty percent of career-related negative affect, with career development self-efficacy, contextual stressors, and gender all contributing independently, adjusted $R$-square $= .49$, $F(7, 165) = 24.16$, $p < .001$. In addition, two interactions were significant: career uncertainty and dysfunctional beliefs, and career uncertainty and gender. Looking at the standardized beta values, we see that self-efficacy was, again, the only variable inversely related with negative affect: higher self-efficacy was associated with lower negative affect. Contextual stressors and gender (specified as women) were both positively related to negative affect. The two interactions were also both positively related with negative affect, suggesting that career uncertainty, while not a significant risk factor by itself, becomes potentially harmful when it is combined with dysfunctional beliefs, or when the person experiencing the uncertainty is a woman.
Table 7.4. Hierarchical regression analyses for predicting career-related negative affect at pretest, using career development agency variables, career uncertainty and gender (N = 165)

<table>
<thead>
<tr>
<th>Step and Variable</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
<th>F-cha</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R$^2$ = .488</td>
<td>30.52</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career uncertainty</td>
<td>.72</td>
<td>.38</td>
<td>.11$^\wedge$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>-.50</td>
<td>.07</td>
<td>-.48**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contextual stressors</td>
<td>2.62</td>
<td>.51</td>
<td>.30**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs</td>
<td>.32</td>
<td>.14</td>
<td>.14*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (female)</td>
<td>3.96</td>
<td>1.52</td>
<td>.15*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>5.19</td>
<td>.024</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R$^2$ = .504, $\Delta$R$^2$ = .016</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career uncertainty</td>
<td>.71</td>
<td>.37</td>
<td>.11$^\wedge$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>-.47</td>
<td>.07</td>
<td>-.45**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contextual stressors</td>
<td>2.63</td>
<td>.50</td>
<td>.30**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs</td>
<td>-.40</td>
<td>.34</td>
<td>-.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>3.77</td>
<td>1.50</td>
<td>.14*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs x Career uncertainty</td>
<td>.15</td>
<td>.07</td>
<td>.34*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>4.16</td>
<td>.043</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R$^2$ = .517, $\Delta$R$^2$ = .013</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Career uncertainty</td>
<td>-.08</td>
<td>.53</td>
<td>-.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>-.47</td>
<td>.06</td>
<td>-.45**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contextual stressors</td>
<td>2.55</td>
<td>.50</td>
<td>.29**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs</td>
<td>-.40</td>
<td>.34</td>
<td>-.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>3.73</td>
<td>1.49</td>
<td>.14*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs x Career uncertainty</td>
<td>.15</td>
<td>.07</td>
<td>.34*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career uncertainty x Gender</td>
<td>1.45</td>
<td>.71</td>
<td>.17*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^\wedge p < .08, * p < .05, ** p < .001$
To better understand the interactions of dysfunctional beliefs and career uncertainty, and career uncertainty and gender, I used scatter plot visualizations (Figures 7.1 and 7.2). In Figure 7.1, career uncertainty for each participant is plotted against his or her level of negative affect at pretest, with the left panel showing those participants below the median for dysfunctional beliefs (the low group), and the right panel showing those participants at or above the median (the high group). The slope of the relationship for those with low dysfunctional beliefs is almost zero; for the group with high dysfunctional beliefs, the slope is significantly positive, indicating a relationship between career uncertainty and negative affect. At pretest, career uncertainty was only a threat to those with high dysfunctional beliefs.

![Figure 7.1. Scatter plot of career uncertainty by negative affect at pretest, paneled by low or high dysfunctional beliefs (median split)](image)

Looking next at Figure 7.2, we see a similar pattern. Splitting the participants by gender shows that the relationship between career uncertainty and negative affect is positive only for women. For men, there is no discernible relationship. The interaction of gender in career uncertainty in the regression model indicates that women in particular may find career uncertainty a threat to their well-being.
As the previous analyses showed that class applicants and non-applicants differed in the impact or importance of career uncertainty, I also performed the same regression analysis with each group by itself. The results confirmed that predictors of negative affect differed between class applicants and non-applicants. For class applicants, career uncertainty, career development self-efficacy and contextual stressors predicted 43% of career-related negative affect, $F(5, 73) = 11.89, p < .001$. There was no effect of gender and no significant interactions, with the final equation for class applicants as:

$$\text{Negative Affect}_{\text{Applicants}} = \text{Constant} + .39 \times \text{(Self-efficacy)} + .24 \times \text{(Career uncertainty)} + .22 \times \text{(Contextual stressors)} + \text{Error}$$

For the non-class applicants, career uncertainty and self-efficacy were not significant predictors, but gender, contextual stressors and the interaction of self-efficacy and uncertainty were. The regression model for this group predicted nearly 55% of the variance in negative affect, $F(6, 91) = 17.11, p < .001$. The final equation for non-applicants was:

$$\text{Negative Affect}_{\text{Non-applicants}} = \text{Constant} + .39 \times \text{(Self-efficacy)} + .24 \times \text{(Career uncertainty)} + .22 \times \text{(Contextual stressors)} + \text{Error}$$
Negative Affect\textsubscript{Non-applicant} = Constant + .40 (Self-efficacy \times Career uncertainty) + .36 (Contextual stressors) + .15 (Women) + Error

The most informative way to visualize the interaction of self-efficacy and career uncertainty was to create a scatter plot with self-efficacy for each participant plotted against his or her level of negative affect at pretest. In this case, the median split was performed on the career uncertainty variable, with the left panel of Figure 7.3 showing participants in the non-applicant condition who had low career uncertainty (more career decidedness), and the right displaying those with higher career uncertainty. For both groups, the relationship between self-efficacy and negative affect was inverse: higher career development self-efficacy was associated with lower career-related negative affect. However, this relationship was more pronounced for those with higher career uncertainty. It appears that among those participants who did not apply for the treatment class, self-efficacy was particularly relevant to well-being if they were also experiencing high levels of career uncertainty.

![Figure 7.3. Scatter plot of self-efficacy by negative affect at pretest, paneled by career uncertainty, non-applicant condition only](image-url)
Posttest Results and Treatment Effects

In this chapter so far, I have explored the relationships among the contributors to career development agency, along with their associations with career uncertainty. I have also looked closely at how these constructs related to well-being, as measured by negative affect concerning career issues. The data at pretest showed that the agency variables of self-efficacy and contextual stressors independently contributed to negative affect. Career uncertainty was associated with negative affect across the class applicants; for non-applicants, higher levels of career uncertainty only put those participants with low self-efficacy at greater risk. There was also evidence that career uncertainty interacted similarly with dysfunctional beliefs for all participants, such that dysfunctional beliefs were associated with higher negative affect among students with more career uncertainty.

As these results were found at pretest, the question remains whether the same relationships among variables exist in the posttest data, and to what extent the treatment may have altered these relationships. In this final section, I describe similar correlation and regression analyses on the posttest data, and consider how condition may have affected these variables’ relationships to each other. Results suggest that the treatment may have influenced the relationship between one factor of career development agency, contextual stressors, and career-related negative affect. For class participants, contextual stressors were positively associated with career-related negative affect at pretest, but not at posttest.

To address the question of how the relationship of each predictor variable with negative affect may have changed from pretest to posttest, I computed the simple correlations for each variable with negative affect at both occasions (Table 7.5). Considering only those participants who completed both questionnaires, we see that the relationships with negative affect are the same at pretest and posttest, across conditions, except for contextual stressors. At pretest, the class condition had a medium-strength positive relationship between contextual stressors and career-related negative affect. At posttest, however, that relationship had declined and became non-significant. One
interpretation of this is that the course reduced the effect of contextual stressors by increasing self-efficacy. However, the waitlist condition also showed an attenuated correlation between stressors and negative affect, so the claim that this is how the treatment worked is somewhat speculative.

Table 7.5. Correlations of negative affect with career uncertainty and career development agency variables, at pre-test and post-test, by condition, study completers only

<table>
<thead>
<tr>
<th>Correlation of negative affect with: (pre / post)</th>
<th>Class (n = 42)</th>
<th>Waitlist (n = 20)</th>
<th>Non-applicants (n =42)</th>
<th>All (n = 108)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career uncertainty</td>
<td>.44** / .39*</td>
<td>.40 , .30</td>
<td>-.06 , .10</td>
<td>.25**</td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>-.57** / -.44**</td>
<td>-.50** / -.72**</td>
<td>-.57** / -.49**</td>
<td>-.53**</td>
</tr>
<tr>
<td>Dysfunctional career beliefs</td>
<td>.19 / .25</td>
<td>.52* / .59**</td>
<td>.52** / .47**</td>
<td>.40**</td>
</tr>
<tr>
<td>Contextual stressors</td>
<td>.34* / .20</td>
<td>.33 / .24</td>
<td>.50** / .40**</td>
<td>.29**</td>
</tr>
</tbody>
</table>

¹ Total at posttest includes four participants who did not take the pretest.
* p < .05, ** p < .01

To provide more detail on the potential changes suggested by the correlations, hierarchical regression analysis was performed to predict career related negative affect at posttest using career development agency (self-efficacy, beliefs and stressors), career uncertainty, gender, and the interactions of career uncertainty with each of the other variables. As before, the five individual terms were entered in the first block using forced entry. In the second block, the four interaction variables were entered using the stepwise method, in which the statistical program selects only those terms that add significant explanatory power to the model.

Given that the number of participants at posttest in each condition was relatively small, I first ran the regression analysis with all conditions combined to get a general idea of how the variables related to negative affect. The final model, as specified in Step 2 of Table 7.6, explained 46% of the variance in posttest negative affect among all
participants, $F(5, 103) = 17.12, p < .001$. Each of the single variables independently predicted negative affect, and one interaction also entered the model. The interaction of career uncertainty and contextual stressors added about two percentage points to the explanation of variance (adjusted R-square) of the dependent variable. Considering the standardized beta weights of each variable, we see that contextual stressors had the strongest positive relationship with negative affect, followed by dysfunctional beliefs, career uncertainty, and gender. Career development self-efficacy had a medium-strength, inverse relationship with negative affect, as did the interaction of career uncertainty and contextual stressors.
Table 7.6. Hierarchical regression analyses for predicting career-related negative affect at posttest, using career development agency variables, career uncertainty and gender (N = 103)

<table>
<thead>
<tr>
<th>Step and Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>F-chap</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2 = .466$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career uncertainty</td>
<td>1.59</td>
<td>.48</td>
<td>.26**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>-.33</td>
<td>.10</td>
<td>-.29**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contextual stressors</td>
<td>.58</td>
<td>.17</td>
<td>.30*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs</td>
<td>.58</td>
<td>.17</td>
<td>.30**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (female)</td>
<td>6.27</td>
<td>2.02</td>
<td>.24^</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>4.50</td>
<td>.036</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2 = .490, \Delta R^2 = .024$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career uncertainty</td>
<td>1.86</td>
<td>.49</td>
<td>.30**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development self-efficacy</td>
<td>-.31</td>
<td>.10</td>
<td>-.27**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contextual stressors</td>
<td>4.86</td>
<td>1.81</td>
<td>.52**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional beliefs</td>
<td>.65</td>
<td>.17</td>
<td>.33**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>6.61</td>
<td>1.99</td>
<td>.26**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career uncertainty x Contextual stressors</td>
<td>-.77</td>
<td>.36</td>
<td>-.42*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .08, *p < .05, **p < .01

Next, I split participants by level of career uncertainty as a heuristic for understanding the interaction term, and examined the scatter plot of contextual stressors against negative affect at posttest. In Figure 7.4, it appears that the relationship between contextual stressors and negative affect was much stronger for those with high career uncertainty than those with low career uncertainty. In other words, contextual stressors mattered, but they mattered more for participants with higher levels of career uncertainty. In the left panel, representing participants with more career decidedness, we can see that
higher levels of contextual stressors were associated with almost any level of negative affect, low and high. This suggests that contextual stressors were not driving negative affect for this group. In contrast, the model for those with high career uncertainty is much more predictive, and we see a stronger relationship between increasing levels of contextual stressors and increasing career-related negative affect.

![Scatter plot](image)

**Figure 7.4.** Scatter plot of contextual stressors by negative affect at posttest, paneled by career uncertainty, all participants

I also ran the regression with condition as an independent variable (class, waitlist and non-applicants), to test whether the treatment changed the relationships among career development agency variables, career uncertainty and negative affect. Regardless of how the conditions were defined (e.g. class versus non-class, class versus waitlist, or class versus non-applicants), there were no significant interactions of treatment with any of the other variables. All of the variables that were predictive of negative affect in the previous analyses remained significant within the models, but the new variable of condition was never significant. This means that although the class applicants were higher in career-related negative affect at pretest, they were no longer distinguishable from the non-applicants at posttest. The lack of interactions with condition further means that the treatment did not change the relationships of career uncertainty and career development
agency with negative affect, though it did change participants’ absolute levels of career development self-efficacy and negative affect. Though the correlations in Table 7.5 suggested the possibility that the treatment changed how the course participants perceived contextual stressors, these data are only descriptive and stronger evidence for this effect was not found in the regression models.

**Summary**

To conclude this chapter, I summarize the results of the regression analyses at pretest and posttest, separating participants by the relevant conditions at each occasion, in Figure 7.5. The independently significant predictors of negative affect differed by condition at posttest, as they did at pretest. The significant predictors for the class condition were career indecision, and gender (specified as women), with a significant trend for self-efficacy to be independently predictive. For the waitlist condition, only career development self-efficacy was significantly predictive of negative affect at posttest. Finally, for the non-applicant condition, dysfunctional beliefs and contextual stressors were significant or near-significant predictors of career-related negative affect within that group.

Before we can ask what the most important risk factors for career-related negative affect were, we must consider the situations of the participants at both test times. At pretest, class applicants demonstrated interest in their own futures and professional careers by registering for the class, “Design Your Life”. Thus, it is not surprising that their levels of career uncertainty predicted, to some extent, their career-related negative affect. It is important to note, however, that career development self-efficacy was actually more predictive of negative affect than career uncertainty, and contextual stressors also independently contributed to reduced well-being. At posttest, I split applicants into those who received the treatment and those who were waitlisted. Career uncertainty and self-efficacy continued to predict negative affect for those who took the class, but only self-efficacy was still predictive for those who did not. This could mean that for the class, the treatment helped them to cope with contextual stressors and perceive them as less threatening, but this hypothesis is only suggested by the data, not conclusively.
demonstrated. For the waitlisted students, the salience of self-efficacy actually grew from pretest to posttest, becoming so important that no other variables entered into the regression model (see Table 7.5 for changes in correlations).

In the non-applicant condition, the story of what happened from pretest to posttest is somewhat different. At pretest, their primary source of career-related negative affect was contextual stressors, such as perceiving graduation as imminent, having parents ask them about their future plans, and feeling that they had many career and life decisions to make. Women in this group reported more negative affect than men, as did those with high career uncertainty combined with low career development self-efficacy. At posttest, dysfunctional beliefs regarding career had become more salient and stressful, while contextual stressors remained a threat to well-being. This finding is consistent with the results from the previous chapter, which showed that dysfunctional beliefs did not increase for the class condition, but did for the others. This increase may explain why dysfunctional beliefs became an important predictor of negative affect only for the non-applicant condition at posttest. Though the treatment did not reduce dysfunctional beliefs, it may have arrested an ongoing process of socialization that propagates myths about careers and career decision-making. This question, however, is more appropriately pursued in the next chapter, in which I will discuss potential interpretations and implications of the study findings.
Figure 7.5. Variables associated with negative affect in regression analyses, by condition and time

**Bold** text indicates variable was a significant predictor at both pretest and posttest
CHAPTER 8. DISCUSSION

SUMMARY OF MAIN FINDINGS

This study investigated the effects of a course on career development for undergraduates, called “Design Your Life”, which combined curriculum on design thinking and career-related skills to help students plan creatively for life after college. The intervention was hypothesized to increase students’ career development agency and decrease their psychological symptoms of distress related to career decision-making; a questionnaire was administered at the beginning and end of the ten-week academic quarter to assess change over time. Results of the study showed that the intervention was effective in enhancing one component of agency, career development self-efficacy, and also decreased career-related negative affect moderately. Two comparison groups of students were also included: waitlisted course applicants, and comparable non-applicant students from the same university. These groups did not share the class’s increase in career development self-efficacy or decrease in career-related negative affect. Students who did not take the class also reported a rise in maladaptive career-related beliefs, which their peers in the class did not experience.

Importantly, class participants did not report improvement in every domain measured. Their levels of career uncertainty did not change, on average, from pretest to posttest, nor did they report changes in contextual stressors. In these respects, they were similar to their peers who were not in the treatment. The effect of the intervention was not to promote career decision-making, but rather to counteract commonly propagated myths about careers, and build self-confidence through productive action.

Although the intervention’s impact on career-related negative affect was modest, the observed decrease was likely related to participants’ increase in self-efficacy, which was in turn related to the course’s required career exploration and planning activities. Class participants also performed better on a design thinking task involving ideation (brainstorming). As performance on this measure was inversely related to dysfunctional
beliefs, the curriculum seems to have contributed to class participants’ protection from an increase in dysfunctional beliefs.

**Discussion of Research Questions**

Having reviewed the data and analyses in the previous two chapters and summarizing the main findings above, I return to the research questions for a more in-depth consideration of the findings and their implications. The first research question was, how does the intervention, “Design Your Life”, impact career uncertainty, career development agency, and career related well-being for emerging adults?

We now know that the treatment had effects on career development self-efficacy, dysfunctional beliefs, and negative affect, but did not change participants’ career uncertainty or reported level of contextual stressors. A potential explanation for the selective treatment effect is that the class participants’ increases in self-efficacy and ability to maintain a low level of dysfunctional beliefs were responsible for the course’s impact on well-being (negative affect). In the following sections, I will interpret the findings and implications relating to each theoretical construct of concern.

*Career Development Self-Efficacy*

Career development self-efficacy, which increased over time for the class condition and did not for the other conditions, reflected confidence in abilities such as using resources to get occupational information or coping with job-search frustration. The hypothesized mechanism by which the class increased self-efficacy was through requiring students to practice career-related development behaviors both in class and as homework assignments. These behaviors included values clarification and occupational research activities, practical skills such as networking and informational interviewing, and detailed planning about one’s personal and professional future after graduation. As the questionnaire asked participants to self-report their frequency of engaging in these behaviors, we know that career development activity did not differ by condition at pretest. At posttest, however, class participants reported many more career development behaviors than they had a pretest. Class participants’ levels of activity at posttest were
also significant higher than other participants’ activity levels at the same time. As expected, career development behaviors at posttest were significantly and positively correlated with career development self-efficacy. A natural explanation comes from Bandura's work: one of the best sources of self-efficacy is what he calls mastery experiences. When individuals perform the actual tasks related to the skill domain, and are at least moderately successful, they develop confidence related to that domain.

If mastery experiences build self-efficacy, and class participants reported high frequencies of engaging in such experiences, it is somewhat surprising that their self-efficacy did not increase even more than it did. An important thing to consider is that all participants started out with relatively high career development self-efficacy scores, with the pretest average at 61 out of 85. We must also remember that career development self-efficacy is just a subset of global self-efficacy; it may be hard to affect domain-specific efficacy scores in the absence of factors that increase self-efficacy holistically. As I did not measure global self-efficacy, I cannot estimate the extent to which overall confidence affected participants’ responses to the treatment. Finally, we should keep in mind that the treatment only lasted for ten weeks, and the posttest was given just a week later. Although class participants did engage in many more career development activities than they had previously thanks to the class requirements, the quarter is quite short and students have many pressing academic and social priorities. Essentially, they have only just begun their process of career exploration and development, so the cumulative effects of treatment may take longer to surface. To test this hypothesis, a longitudinal study could follow up with these participants and correlate the extent to which they continued using the skills and processes learned in class to their psychological and objective outcomes.

Dysfunctional Career Beliefs

The intervention also appears to have helped with another mechanism of career development agency, dysfunctional beliefs, though in a different way. The dysfunctional beliefs scale included common career myths, such as, “My career will be determined by the choices I make now,” and, “College graduates should know what they want to do
Students who were waitlisted for the course and other juniors and seniors at the university experienced a significant increase in their agreement with these harmfully misleading statements over the ten-week academic quarter. Importantly, those in the treatment were “protected” from this outcome: their level of dysfunctional beliefs did not change.

There is reason to believe that the design thinking curriculum played a role in the maintenance of low dysfunctional beliefs about career for class participants. Class participants did better than students in the other conditions on measures of ideation (brainstorming), which is a foundational skill related to product design. Furthermore, this measure was significantly negatively correlated with dysfunctional beliefs, not only for the class, but also for the non-class conditions at posttest. This relationship suggests that the skills and principles related to design thinking can be beneficial in a completely unrelated domain, career development and choice. These methods and attitudes may include acceptance of failure, willingness to take risks, valuing and knowing how to “think outside of the box”, and being willing to dive into a problem and reflect deeply in order to generate potential solutions.

An alternative explanation for the class condition’s higher performance on the ideation task is that the design thinking curriculum encouraged them to use creative abilities that they already possessed. Design thinking explicitly encourages creativity and innovation, even to the point of silliness or seeming crazy to others not in that context. According to Sternberg (2006), the main difference between someone who is creatively expressive, and someone who is not, may merely be that the creative person feels licensed to be creative. Although Sternberg acknowledges that there are prerequisites to creativity, such as knowledge, he argues that it is, fundamentally, a decision. The students in the class decided to be creative on the posttest measure simply because the class gave them permission to do so and, moreover, they felt that it was expected. Nevertheless, releasing or licensing a creative ability that already exists it certainly a positive outcome, arguably as positive as (or indistinguishable from) teaching creativity. Whatever
mechanism underlies the creativity that produces ideation, that construct seems to be inversely related to harmful beliefs in career myths.

The next question, then, is why the course participants did not experience a significant decrease in dysfunctional beliefs, despite their evident learning of the design thinking curriculum. The effect of the treatment was merely to protect them from the increase in dysfunctional beliefs that their non-class peers experienced over the ten-week academic quarter. There are several potential reasons. First, it is important to note that everyone was in the lower half of the possible range on the dysfunctional beliefs scale at pretest, so they did not have a large amount of room to improve. Second, participants may not have been entirely honest about their beliefs at pretest, due to embarrassment about the negativity and pessimism expressed by the statements. For example, the item, “Trying out different careers is uninteresting,” may seem undesirable according to a cultural value of openness to new experiences, which is particularly salient in college. While it may seem that participants would maintain the same level of social desirability in their responses at pretest and posttest, this is not necessarily the case. Students in the class condition who felt embarrassed about their dysfunctional beliefs at pretest may have felt more self-accepting and honest at posttest, after realizing that classmates shared their feelings. In that case, the seeming lack of difference from pretest to posttest in the class condition would conceal a true reduction. Although I did not use a “social desirability” or “lie” scale in this study, including such items – which are designed to gauge the extent to which a participant is masking his or her true feelings and beliefs – would test the theory that class participants’ honesty increases from pretest to posttest.

A third explanation for course participants’ lack of change is that they may not have been aware or accepting of their own dysfunctional beliefs at pretest. It is certainly possible to consciously state a belief (or lack of belief), yet act in contradiction with that statement. The self-discovery and evaluation techniques taught in the class may have made students more aware of their actual beliefs and how these subconscious thoughts have influenced their behavior. This has been described as moving from “unconscious incompetence” to “conscious incompetence” (Adams, 2011). This learning process,
rather than a total lack of treatment effect, could explain the flat-line results of the class participants’ dysfunctional beliefs. If this were true, then an open-ended question probing students for understanding of their own career-related beliefs, and how these beliefs may have changed, could show how conscious incompetence differs qualitatively from the “unconscious” or unaware state evinced at pretest.

Even if the treatment did not produce a substantial decrease in dysfunctional beliefs, the protection effect is valuable in itself. College students in their final years are exposed to many myths about career and work, from media, family members, and their peers. The treatment may have disrupted this ongoing process of oppressive socialization to career norms. While students who were not in the class got an unchallenged message that making an early and firm career decision is normative, and that mistakes and uncertainty are ruinous, those in the class received an opposing lesson, which inoculated them against these misconceptions. It would be fascinating to measure dysfunctional beliefs about career at various points in students’ and graduates’ lives, from childhood through retirement, to determine if there is a socially-defined trajectory in these types of thoughts. Or, an interesting experimental study could continue to provide “booster shots” of anti-dysfunctional beliefs lessons to some graduates while not reminding others; how long would an inoculation from the “Design Your Life” class last? I would also love to be able to correlate young people’s beliefs in career myths with media exposure or other situational factors such as culture, socio-economic status and parental occupations.

*Career-related Negative Affect*

Students who participated in the intervention reported a decrease in negative affect, which included experiences of stress and anxiety, depressed mood, and withdrawal or avoidance, in the domain of career development and choice. Although their decrease in *absolute* negative affect was not large enough to make the class statistically different from the other conditions, a secondary analysis with normalized *improvement* scores indicated a potential trend for the students in the class to improve more (relative to themselves at pretest) than their peers. For the most part, the other students tended to experience a small decline in well-being.
Perhaps the most important question regarding the intervention is why negative affect did not decrease more substantially for the class participants. If one of the primary predictors of negative affect is self-efficacy, and their self-efficacy increased significantly, career-related negative affect could be expected to decrease more than it did. There are several potential reasons for the treatment effect appearing weaker than desired. The first few are the same as those discussed above in reference to dysfunctional beliefs: a bias against reporting negative emotions that reduced reporting at pretest, but had less of an effect at posttest, and a relatively low starting level of negative affect that prevented huge improvements. The move from “unconscious incompetence” to “conscious incompetence” may also be relevant for negative affect. While students may be unreflectively “okay” with their career development status at pretest, the course may have raised new questions and doubts, as well as new realizations about personal aspirations, the world of work, and career paths. Anxiety can be part of the natural and health process of adapting to new information; it is possible that for some students, the course increased negative affect by shaking them out of complacency.

For example, a senior with a relatively firm plan to work in consulting, but with a seed of doubt, could enroll in the course and report low negative affect related to career at pretest. If she discovered that she wanted to pursue a more unconventional path through the class activities and discussions, letting go of her initial career plan and the safety it represented could trigger stress and even depressed mood, especially as she watched her friends confidently go to consulting interviews.1 Career counselors and psychologists would probably agree that this U-shaped development curve, in which students go through a period of questioning and worry before regaining confidence and positivity, is a valuable and necessary process towards a fulfilling life.

In retrospect, the study would have benefitted from a variety of other dependent measures beyond negative affect. Though career-related stress, anxiety, depression and withdrawal are certainly unpleasant and in most cases, an appropriate target for

1 This example comes from a conversation with the course instructor, Dave Evans.
amelioration, it is likely that some amount of negative experience is a normal and necessary part of development. Unfortunately, the measure as it was used does not allow us to draw conclusions about which students were truly floundering and at risk for reduced well-being, and which students were just going through a normal but challenging transition in emerging adulthood. I do want to be careful to note that the goal of the research presented here is not to suggest that all career-related negative affect needs to be prevented. As Mill (1863) famously wrote, “It is better to be a human being dissatisfied than a pig satisfied; better to be Socrates dissatisfied than a fool satisfied.” One of the most important contributions of classes such as “Design Your Life” is dissuading and challenging students who would otherwise foolishly—and happily—pursue careers and life plans to which they were terribly ill suited.

With that in mind, future research on career-related well-being should include measures beyond affect immediately after an intervention. Though negative affect did decrease modestly for course participants, it is possible that it would have declined even more at a later time. After all, students had only just learned and barely begun practicing methods for coping with stress and career-related problems. Moving beyond negative affect, I would predict that a year to five years after graduation, students who took the treatment class would report higher job satisfaction than those who did not, and would probably also had more unusual and individually designed career paths and plans. Royalty and Oishi (2011) investigated career paths and outcomes among recent alumni of the Stanford Institute of Design (“d.school”), which focuses on the same core concepts and skills taught in the “Design Your Life” course. Remarkably, 72% of the 176 alumni surveyed said that their current occupation was different from what they had planned to do when they entered graduate school, and a majority of these career-changers said that their experience at the d.school influenced this shift “A great deal”. In a follow-up interview study, multiple alumni said that the design thinking concepts and attitudes they learned helped them to choose, design or change to careers that were more satisfying than their original or default plan. If the students in the treatment class used what they learned about design thinking in a similar manner, then we could find similar positive outcomes among them in a few years.
Career Uncertainty and Contextual Stressors

An interesting finding of the study was that not everything changed for the class graduates. The course did not have a significant effect on their levels of career uncertainty, that is, the status of their choices regarding professional fields and specific jobs to pursue after college. Non-class participants in the study also did not report big changes, positive or negative, in their levels of career uncertainty during the ten-week study period. All participants also reported similar levels of contextual stressors at the first and second testing occasions. These contextual stressors included situations and events like graduation coming up soon, parents asking about future plans, financial challenges, and a (perceived) tough job market with high unemployment. As a class could not be expected to alter individual context, family life, or societal conditions, this non-effect of treatment was expected. Likewise, according to the course instructors, the goal of the course was not for the students to make firm career decisions, so increase in career uncertainty was not hypothesized. Instead, the course attempted and achieved a targeted aim: enhancing career development agency and related well-being.

The intervention’s failure to move participants’ scores on the career uncertainty and contextual stressors constructs is important and positive. That career uncertainty and external, situational stressors did not decline for the class participants, anymore than they did for the non-class participants, suggests that their positive responses to the questions related to self-efficacy and well-being cannot be explained by a “halo effect” or demand characteristics of the questionnaire. In other words, it was not merely students’ general happiness, satisfaction with the course, or desire to please the instructors or researcher that produced the treatment outcomes.

Predicting Career-Related Negative Affect

After treatment effects, the second research question was: how well do career uncertainty and career development agency predict career-related negative affect? With correlation and hierarchical linear regression analyses, I found that these constructs predict negative affect well; however, the model was not one-size-fits-all. Students in this
study differed on how much career uncertainty seemed to matter to them, as well as which agency factors had the largest influence on their well-being at a given time. Overall, the common conception that career uncertainty is problematic for emerging adults was only partially upheld. Only those students who indicated some sort of pre-existing belief or worry about career uncertainty or other life questions, by applying to the treatment course, showed a relationship between career uncertainty and stress, anxiety, depressed mood and avoidance regarding career issues. Students who had not applied for the course showed no relationship between career uncertainty and well-being, as measured by negative affect. This finding supports previous authors’ contentions that there are different types of clients in career counseling (Multon et al., 2007). Some clients report high levels of distress along with their uncertainty, while others do not. Some emerging adults in college may have questions about work and their future occupations, but may not seek career counseling because they do not perceive indecision or ambiguity as problematic. On the whole, the current findings suggest that career decision status is not the whole story regarding well-being in this domain.

The other big part of the story is career development agency, which I measured using career development self-efficacy, career related beliefs, and relevant contextual or situational stressors. As predicted by Bandura's theory of agency, low self-efficacy was the single largest predictor of psychological distress, and affected all participants in the study, regardless of whether they had applied for the treatment class. For the class applicants, career development self-efficacy powerfully predicted well-being by itself. For the non-applicants, it was the interaction of self-efficacy and uncertainty that was most relevant. For those students who were experiencing high levels of career uncertainty and were not in the treatment, low self-efficacy was associated with high negative affect, while high self-efficacy protected those with uncertainty.

In addition to self-efficacy, another component of career development agency, contextual stressors, was also found to impact well-being in different ways across the groups of participants. At the beginning of the study, higher levels of these situational stressors were related, quite understandably, to higher levels of stress for everyone. In
fact, for the non-applicants, number of contextual stressors was the second-largest predictor of negative affect at pretest. It continued to predict negative affect for that group at posttest. In contrast, the level of situational stress was no longer a factor in well-being for the class at posttest, nor for the waitlist. A potential explanation for this difference is that the treatment increased students’ resilience to stressful events and situations (recall that the total number of these reported events and situations did not decrease for any condition). This explanation, however, would not apply to the waitlist condition, so there are two possibilities to consider. The first is that students in the waitlist condition somehow increased their own resilience through some other method. This is a reasonable possibility, as students who applied for the class had clearly demonstrated a proactive attitude towards coping with their own career uncertainty, or other future life questions. A second, less optimistic explanation is that these students were so crippled by their low self-efficacy in this domain, that by the posttest, it was the only factor that continued to matter. Such an interpretation, while undesirable, is supported by the fact that the correlation between self-efficacy and negative affect, for the waitlisted condition alone, increased by 44% from pretest to posttest. For the class and non-applicant condition, the relationship between self-efficacy and negative affect decreased in strength from pretest and posttest. It would be an interesting follow-up study to provide the treatment for the waitlist condition in particular, and see whether their predicted increase in self-efficacy would allow other factors, such as contextual stressors, to resurface in relation to well-being in the career domain.

Finally, the results provided somewhat equivocal support for the hypothesis that the third risk factor to career development agency, dysfunctional beliefs, also predicted negative affect in that domain. The clearest situation in which dysfunctional beliefs predicted negative affect was for the non-applicant condition at posttest. Furthermore, when combining the data across all conditions at pretest, the interaction of dysfunctional beliefs and career uncertainty was the first of only two interaction terms that entered the stepwise regression model. Considering all participants together, a high level of dysfunctional beliefs made career uncertainty more detrimental. It is strange that this effect did not show up when considering each condition separately. It may have been too
difficult, however, to uncover the influence of dysfunctional beliefs alone because the scale was moderately (inversely) correlated with self-efficacy, which had a large impact on well-being by itself. Therefore, it is possible that participants’ level of dysfunctional beliefs could not make an independent contribution to the statistical model, particularly when running separate analyses by condition and thereby reducing the available variance in scores.

Although unrelated to the main research questions and hypotheses, there were also findings about individual difference factors such as gender and year in college. As has been the case in numerous studies, women in this research project seemed to either experience or report more negative emotions and outcome then men did. There was also some indication that women perceived more contextual stressors than men did. These findings were consistent at both testing occasions, and across several different statistical approaches. Gender also appeared as an important factor for predicting negative affect in the regression analyses. At both pretest and posttest, considering all participants together, the regression model with the best fit included being a woman as a significant explanation for reduced well-being. At pretest, there was also a significant interaction between career uncertainty and gender, such that for women, career uncertainty was more likely to be associated with career-related negative affect. When we consider each condition separately, being a woman shows up as a risk factor for reduced well-being for non-applicants at pretest, and for the class participants at posttest.

If gender does have a powerful effect on the experience or reporting of negative emotions and outcomes, one question that remains is why gender was a significant predictor of negative affect when looking at all participants together, but not significant for all conditions at all times. As these analyses used all participants, not just those who completed both pretest and posttest, attrition is one potential explanation. It is conceivable that the particularly unhappy or vulnerable women failed to complete the study, but the pretest equivalence analyses showed no differences between completers and study dropouts. A second potential explanation for why gender was not always a significant predictor of negative affect is the “eclipsing” effect mentioned above. At
certain times, factors beyond gender, such as career development of self-efficacy, may be so powerful that there is little room for other factors in the model. In the case of the class participants, it could be that the course increased their self-efficacy such that low self-efficacy was no longer a primary problem. Then, at posttest, the effects of gender could be revealed.

The “eclipse” explanation suggests the possibility that rather than each independent factor contributing simultaneously to well-being in the career domain, they may exist in some kind of hierarchy. That is, one factor, such as career development self-efficacy, could be responsible for most of an individual's negative affect when it is particularly low. Once self-efficacy is raised past a certain point, however, other factors may become more salient. Although it is difficult to hypothesize about the exact order of such a hierarchy, an important point to be made from this data is that at no time, and within no participant condition, was career uncertainty the largest or sole predictor of career related negative affect. It would certainly have a role in the hierarchy among certain kinds of students, but it would not be at the top, and it would share space with the career development agency variables.

The other individual difference found in the data was based on year in college (junior or senior). Findings about this difference must be interpreted cautiously, as there were relatively few juniors in the study: only 31 completed both pretest and posttest. Within that sample, however, juniors consistently reported fewer contextual stressors and higher dysfunctional beliefs than seniors. That the younger students would have fewer stressors related to their futures makes sense. For example, the item, “Graduation is coming up soon,” depends on the individual’s interpretation of the word “soon” – juniors could agree as readily as seniors. It does seem likely, however, that the imminence of graduation would be higher for seniors than juniors. It is harder to explain why juniors in the sample had higher levels of dysfunctional beliefs than seniors. Simple maturity may be one reason: seniors have had an extra year for experiences which would disabuse them of the notion that, for example, “Trying out different occupations is frightening.” With career questions rapidly becoming more salient in the final year of college, more seniors
than juniors may have engaged in activities such as internships and occupational research, which could result in seniors having a more informed, balanced outlook. Seniors may also have agreed with the dysfunctional beliefs items less due to cognitive complexity developed through education, and a greater appreciation for the fact that black and white statements are rarely accurate.

LIMITATIONS

The quasi-experimental design used for this research, while practically necessary, limits the findings in several ways. When participants self-select into a treatment group, they may differ from others in systematic and significant ways. For example, students who applied to get into the Design Your Life class not only had more demonstrated interest in their professional futures than those who did not apply, but also may have had more exposure to the sponsoring department, more social connections with other students who had taken the class, or simply more time to take classes outside of their academic requirements. Given the impossibility of measuring and controlling for all variables associated with self-selection, it is preferable to use random assignment to treatment and control groups. Unfortunately, random assignment was not possible within the practical constraints of this study, as students who did not wish to take the class could not be enrolled against their will. The assignment of participants to conditions was also made less random by the fact that the instructors chose class members based on gender, year and major and were not blind to the students’ identities. There is, therefore, some possibility that the waitlisted students differed in unknown but systematic ways from the class participants. It is also possible that participants in the non-applicant condition were not representative of the student body overall, as the sample was taken using the convenience method using email lists available to the instructor of the treatment class. Though there is strong evidence for the effects of the treatment, we should not conclude that differences found between class, waitlist and non-applicant groups were due entirely to these effects.

As in any study using questionnaire data, the limitations of the measures were some of the biggest limitations of the study. Depending on negative affect as the sole
dependent measure of well-being was a strategic choice because psychological distress was of high practical concern and the intervention was designed to ameliorate it. Well-being, however, has many more facets than low negative affect, and it would have been informative to measure non-affective components of mental health and flourishing. Other studies related to career development have looked at job search behavior (e.g. number of job applications; Cote, Saks & Zikic, 2005) and employment success (e.g. offer salaries; Oettingen & Mayer, 2002), and such objective measures would have enhanced the claims of the study. Likewise, the lack of decrease associated with treatment for dysfunctional beliefs may have been due to the brevity of the scale, which included only ten items in its final version. Though I would have liked to use more items from the Career Beliefs Inventory (Krumboltz, 1994), and included questions from similar scales such as the Career Thoughts Inventory (Sampson et. al., 1998), I focused on only a subset of the dysfunctional beliefs that I considered most relevant and potentially harmful for emerging adults about to finish college. Unfortunately, time constraints on the questionnaire made a wider range of both independent and dependent measures infeasible.

Questionnaire data in itself, of course, has inherent limitations. Excepting the ideation measure, nearly all of the data used in this research was self-reported by students, and their responses cannot be assumed to be the literal truth – though it is also inappropriate to assume that they are completely invalid. Questionnaire data is used extensively and there is a great deal of research demonstrating its validity and usefulness (Weisberg, Krosnick, & Bowen, 1996), but it is always desirable to have another form of data to provide confirmation of the self-reported findings. This is especially a concern given the known tendencies for women to report negative affect differently than men (Clancy & Gove, 1974), a phenomenon that did show up in my data, and for the social desirability response bias to reduce the veracity of self-reported unpopular beliefs (Grimm, 2010). As noted before, self-report data on beliefs may also suffer from the problem that the precepts upon which individuals act may not correspond exactly to those that they consciously espouse. Lack of self-knowledge, self-deception, low emotional intelligence or introspective ability, or simple immaturity could mean that asking young
people what they believe about work is not the most fruitful avenue for finding out how they will behave.

Participation issues also hampered the study, particularly the relatively small number of participants in the waitlist condition and the high rate of attrition in the non-applicant condition. Furthermore, the two non-treatment conditions also suffered from a gender imbalance (more women than men) that was not matched in the treatment condition (the class participants). This is unfortunate because the waitlist condition was the closest possible control group, consisting of students who had applied for the class and were therefore demonstrably similar to the students in the class. As many more women applied for the class – an interesting finding in itself – the instructors’ wish for a gender-balanced class meant that there was a disproportionate number of women, particularly junior-year women, who were in the waitlist condition. It is also the case that while the waitlist condition was considered as a control group, their most notable difference from the class participants – they did not get into the class – could have influenced their responses. First, they had a higher rate of attrition than the class participants, which could indicate resentment or disaffection due to their failure to be admitted. Second, even those that participated could have had negative emotional responses to the questionnaire because it was associated with the course they did not get into.

Another limitation related to participation arises from the narrow population this study sampled: third- and fourth-year college students at an elite university. While this study explicitly concerned emerging adults about to make the school-to-work transition – and thus makes no claims to generalize to older adults or other populations – the selectiveness and high cost of attending the institution makes them a special group of students. As Schoon (2007) rightly points out,

“…societal change and the associated increasing uncertainty [about economic and social developments] does not impact on all individuals in the same way, and there has been an increasing polarization between those who are able to benefit
from the economic and social transformations and the ones who are excluded, largely because of their relatively disadvantaged socioeconomic circumstances and lack of access to opportunities in education and employment.” (p. 94)

In Schoon’s view, questions of agency in relation to career must be situated in the sociohistorical context of the individuals concerned. According to this perspective, we must be careful not to assume that the findings of this study apply to all emerging adults or even all college students. Undoubtedly, the students in this study, though drawn from diverse economic and ethnic backgrounds, are among those who have benefitted the most from the transformations that have made a life stage such as “emerging adulthood” even thinkable. This study’s sample selection should does not mean that the experiences and challenges of those who have not benefitted so greatly are in any way less important. However, the existence of less advantaged populations should also not make us assume that the experiences of the “lucky few” are uniformly wonderful, happy, and of no concern to those who are responsible for their education and development.

Finally, it must be noted that the design of the research means that any potential effects of the course could be due to a multiplicity of factors. In addition to the course content and activities, the instructors played a key role in the success of the class. Therefore, the hypothesis that design thinking was helpful in the process of improving career development agency among students should be tested with different instructors and in different contexts. If similar results can be achieved in additional experiments, there would be stronger evidence for the efficacy of design thinking as a novel curriculum in career and personal development.
CHAPTER 9. CONTRIBUTIONS

Behind nearly every empirical endeavor there is a normative claim; in this research, one of my goals from the beginning has been to motivate a shift in the research literature, from valuing career decision-making, to encouraging career exploration and development. The findings discussed in prior chapters provide support for this argument, by showing that career uncertainty causes less psychological distress than low self-efficacy, and little harm among a subset of college students with relatively low career salience. Career uncertainty, is after all, a necessary and normal stage in the growing up process. Most would agree that a 4-year-old should not make a final decision about his occupation when the best job for him may not even exist yet (home robot trainer?). So why, then, do we think that a 20-year-old must make this decision to be on track socially and developmentally? In both cases, the bulk of their lives is still ahead of them, along with unforeseeable personal, social and economic changes. While some decisions need to be made, of course, this research has worked to undermine the concept of the one, final, ultimately important decision. In the process, I believe that the work reported here has contributed to the research literature, and the fields of career counseling and education, in theoretical, methodological and practical ways.

THEORETICAL

At the theoretical level, I have specified a model that includes a new construct, career development agency, and identified key elements of this construct, such as self-efficacy and contextual stressors, which have implications for well-being in emerging adulthood. Replacing the original, simple model, which connects career decision status directly to well-being, the model in Figure 9.1 allows a much broader perspective on the factors influencing emotional and psychological outcomes related to career development in emerging adulthood. Based on the results described in previous chapter, this model has been updated to include gender and revised relationships between career uncertainty and reduced well-being, and dysfunctional beliefs and reduced well-being. The data suggest that being a woman is an independent risk factor for negative affect, and furthermore, that women may respond to career uncertainty with more symptoms of psychological distress
than men. Though dysfunctional beliefs did not have the direct relationship to well-being that I hypothesized, there was evidence for an interaction of dysfunctional beliefs with career uncertainty, such that higher dysfunctional beliefs made career uncertainty more of a threat to well-being (though this was difficult to explicitly represent in the figure).

Finally, in regard to the question of whether career uncertainty, itself, is a risk factor for negative affect in emerging adulthood, the model shows that this was only the case for a subgroup of participants – those for whom career questions were highly salient already (the class applicants). For others, the impact of career uncertainty was indirect, such that career uncertainty strengthened the relationship between contextual stressors and reduced well-being but was not an independent contributor to negative affect.

**Figure 9.1.** Revised risk model of career development agency, career clarity and well-being

*Note: Short-dash lines indicate an interaction rather than a direct relationship; long-dash lines indicate that the relationship only holds for those emerging adults with high career salience.*

**Methodological**

Given the new constructs introduced by this research, another contribution to the field is the measures developed for the study. The Career Development Self-Efficacy
Scale may be a useful alternative when the Career Decision-Making Self-Efficacy is inappropriate; for example, among students with relatively firm career decisions who nevertheless suffer from career-related emotional distress or doubt. Career development self-efficacy will also be useful for assessing those students who are not facing imminent decision points – such as college freshmen and sophomores – who need to develop exploration and investigation skills rather than decision-making skills. Finally, I believe the Career Development Self-Efficacy Scale is preferable to Career Decision-Making Self-Efficacy in any case in which the student or client could construe the emphasis on decision-making as an implied normative claim, which could increase his or her sense of pressure and anxiety.

Another methodological contribution comes from the Dysfunctional Beliefs Scale. Although I would still like to test and refine this measure, it is an important step in the research literature for two reasons. First, it included several novel items that reflected dysfunctional beliefs specifically about career decision-making, such as that a single professional decision is preferable, and that a good early decision obviates challenges later in life. While such beliefs regarding decision-making have been included in pre-existing scales, such as the Career Beliefs Inventory (Krumboltz, 1994), the Dysfunctional Beliefs scale has more varied items on this topic, which allow the construct to be measured with greater subtlety. Second, the Dysfunctional Beliefs scale was designed to reflect those thought most harmful to emerging adults who are engaged in the school-to-work transition; no other measure of career thoughts is tailored to this particular age group. This research will hopefully suggest the development and use of more measures designed for specific life stages and situations.

Finally, though no one has achieved a paper-based measure of “design thinking” that encompasses all of its skills, dispositions and processes, this research suggests that taking a sub-component approach to measurement is one fruitful avenue. Ideation is neither the most important nor broadest theme within the design thinking problem-solving process, but it is relatively easy to measure and is a foundational real-world skill. Regardless of whether the intervention taught ideation or merely licensed it, getting
college students to express creative ideas through design thinking is a valuable addition to higher education pedagogy. Thus, measuring ideation is one initial way to gauge the effectiveness of programs that aim to encourage innovative thinking, and the test for ideation that I designed and used allowed for group differences in performance to surface. In the future, I hope to continue working on measures of design thinking to be able to assess other, more comprehensive skills and dispositions using actual performance.

PRACTICAL

Accepting a conceptual shift from career decision-making to career development also has implications for counseling theory and practice, designing career interventions, and higher education policies and pedagogy. In the applied domain of counseling, for example, when a client presents with career indecision and related anxiety, homework assignments could include the Career Development Self-Efficacy scale as well as more traditional assessments such as the Myers-Briggs Type Indicator or Strong Interest Inventory. Then, if the student shows very low career development self-efficacy, the counselor can address these worries explicitly along with the career uncertainty itself. A potential benefit of adding career development self-efficacy into the counseling approach is helping those students, commonly the most gifted ones, who have aptitudes for a diversity of wildly varying occupational fields, and who may feel overwhelmed by their options (Kerr and Erb (1991) call this a problem of “multipotentiality”). By helping them see that they do not have to choose a single career path, career counselors can acknowledge these students’ talents and provide them with perspectives and practical tools for coping with what will most likely be a professional life full of opportunity, change, and achievement in multiple domains.

Moving the focus away from decision-making makes room for many other issues to be addressed in career counseling. Given the role of contextual stressors in negative affect, I would also recommended that students complete an assessment of their current career-related stressors; of course, counselors already do this during initial conversations with clients. One contribution of this research is to validate their approach and provide a uniform method for measuring students’ career-related contextual stress. That events and
situations such as graduation coming up, financial difficulties, and feeling pressure to make big life decisions cause stress, anxiety, withdrawal and even depression is not a new idea, or surprising in any way. Though conceptually linked with career decision status—parents will certainly ask their philosophy major child more pointed questions than they will pose to their med-school accepted biology graduate—contextual stressors are independent risk factors for everyone, not just those with high career uncertainty. I can imagine having the Contextual Stressors Index on web-based career resources, so that even students who do not come in for counseling realize that career uncertainty may not be the only source of their psychological distress, nor the only path to ameliorating it.

Another possibility suggested by the research is for career centers to consider a more holistic approach to drawing students in for services. Clients of university career counseling centers typically ask for help in one or two areas: career decision-making, or getting a job in a chosen field (e.g., resume writing and interview practice). While important, these are not the only functions of career development centers, but they are the ones most visible to and known among students. While a “Life Development Center” is probably too corny, getting the campus culture to recognize the myriad possibilities for counseling could result in more students taking advantage of the services. As many students who experience career-related negative affect also have low self-efficacy in that domain, or psychological stressors related to familial and social expectations, they present an opportunity for psychological and career counselors to work together. Hinkelman and Luzzo (2007) have noted that career counseling clients frequently present with problems that overlap with those addressed in psychological counseling. Cross-functional training and greater professional interaction—even to the point of housing both support centers in the same building—could encourage cross-pollination and more holistic support for the university community.

That more support is needed is indicated by the fact that the intervention course, “Design Your Life”, is consistently oversubscribed. While ideal for research as a control condition, the waitlisted students prove that there is greater demand for this type of guidance and support in higher education. In addition to the possibility of offering more
resources for students with career and future concerns, colleges and universities may want to start the process earlier. The course is only open to juniors and seniors because they typically have the most pressing problems. It could be better, however, to start with freshmen and sophomores, so that they are less likely to reach a point where they experience high levels of distress related to their career and future plans. Of course, many university career development centers do a great job of outreach and support for all students regardless of year. Just as some students do not seek psychological counseling, however, others do not seek career counseling for various reasons. Therefore, more courses that combine academic and career-related curriculum could be attractive alternative for students who may not otherwise get help.

In particular, this research has shown that a curricular approach that combines actionable skills with new ways of thinking about career problems is potentially very effective. As noted in Chapter 1, increasing self-efficacy is not just a matter of reassuring students or teaching them how to generate positive self-talk. True self-efficacy is built through mastery experiences, when people perform actions in the domain and receive feedback about their performance, which allows them to improve. Self-efficacy is also encouraged by vicarious mastery experiences, such as hearing inspirational stories of others or learning from a professional mentor. As noted by Bandura (1982, 1989), other factors such as social support also can enhance self-efficacy in a given domain. Classes like “Design Your Life” can provide the kind of extended, positive social environment that is not available in one-time individual career counseling. In fact, other instances of the class have produced ongoing meet-ups of graduates who continued to support each other and discuss their career and life concerns for more than a year after the class ended. That career development does not have to be a solely individual endeavor is certainly one of the most interesting implications of the intervention.

Although the design thinking curriculum did not have as large of an impact on career-related dysfunctional beliefs as hoped, the innovative approach described in this research does offer implications for education. First, even a limited (two-week) introduction to design thinking can produce differences in ideation performance more
than two months later. This suggests that the design thinking curriculum is quite powerful and memorable for students – indeed, course applications analyzed in the pilot studies indicated that the concept of design thinking attracted many students to the course.

Second, the link between ideation and dysfunctional beliefs is fascinating because of the large distance between the two domains – one required students to come up with new products for people going to the beach, while the other had to do with common misconceptions about career choice and professional success. While explicitly connected for the class participants, these two areas were in no way connected for the non-class participants, yet they too showed this inverse relationship. An implication of these findings is that design thinking skills and dispositions such as ideation, risk tolerance, and low fear of failure underlie creative performance and beliefs in other domains. Though the non-class participants had little to no experience with design thinking, those with personalities or other educational experiences that encouraged traits similar to those found in designers did well on the ideation measure. Thus, though design thinking is not the only path to such traits, it is certainly one effective path for the class participants, which could be expanded to other courses and academic programs. This seems especially relevant in today’s job market, which is increasingly complex and driven by innovation among the “creative class” of professionals (Florida, 2002). With higher education facing a major social shift in its perceived function, and under increasing pressure to prove its value (e.g., Barecca, 2010), broadly applicable problem-solving skills such as those encouraged through design thinking are becoming increasingly popular (Nussbaum, 2009). Therefore, the need for research on this methodology and its outcomes for students is also growing.

Finally, in terms of practical contributions to course re-design and new course development, the research presented here has multiple actionable findings. First, students who apply for the course demonstrate high career salience, but they are not the only ones who suffer from stress and anxiety about career. Therefore, outreach by course instructors or others launching similar interventions should address the different categories of students directly (e.g. uncertain and distressed, certain and distressed, uncertain and comfortable, certain and comfortable) and perhaps even separate courses or sections can
be created for each type of student. Even those who are certain and comfortable could possibly use support in building their career development agency, as the day when a 20-year-old’s career certainty or comfort is shaken is certainly on the horizon.

Second, for those students who most commonly seek career counseling or other support – who have relatively high career uncertainty and related psychological distress – treatments should address self-efficacy and dealing with contextual stressors as higher priorities than gaining more career certainty. In particular, the surprisingly high impact of contextual stressors implies that treatments should work towards ameliorating students’ negative responses to stress. In “Design Your Life,” for example, students learn several exercises aimed at increasing positive emotion and reducing anxiety, similar to those taught in mindfulness meditation (Kabat-Zinn, 1990). This research supports increasing the amount of time and effort spent on teaching students these practices, and is consistent with Pope’s (2001) work on reducing student stress and related mental illness.

A third and final recommendation for the design of interventions to aid career development among emerging adults is to focus not just on learning, but also un-learning and re-learning. As noted above, one of the reasons for the popularity of the “Design Your Life” course is that it offers a unique academic curriculum on design thinking, which students can learn and apply in domains beyond their own career development. What students probably do not realize is that design thinking is meant to challenge and replace old ways of thinking and myths about career choice and development. While it is relatively easy to tell a college student that, say, career uncertainty is acceptable and normal, and that early professional failures are learning opportunities, it is far more effective for them to learn these lessons themselves through a planned experiential lesson in design thinking. It is not clear, however, from the course curriculum or the research, how the process of “un-learning” happens, and what factors facilitate the release of maladaptive beliefs and the acceptance of new thoughts and patterns of behavior. To increase the effectiveness of the intervention and the adoption of design thinking, this aspect of the course – the process by which individuals recognize and then let go of troublesome and persistent negative thoughts – should be made explicit and emphasized.
Helping students become more reflective, gain greater self-awareness, and exercise agency with respect to their own thoughts, beliefs and behaviors are among the most valuable goals of education.
APPENDIX A: STUDENT INFORMATION FORM

ME104B – New Student Application
Designing the Authentic Life: Bill Burnett, Dave Evans

Name:________________________, Major: __________ , Age: ___, (M / F), (JR / SR)
Email:________________________ Cell Phone:________________________

How did you hear about the course? (Friend, YouTube, flyer, email notice, other)

What attracted you? What are you hoping to get out of the course?

What are you hoping it’s not about?

Where or to whom else have you gone at Stanford to get help on questions about life after graduation, and how much help have you found?

What sort of experiences, projects, jobs, internships, etc. have you had which have given you any insights on vocation (either positive or negative)?

What if any coursework at Stanford has had the most impact on your future planning ideas (either positively or negatively)?

Are there any class members you hope to be paired with in your Section Group? (pairing requests are not guaranteed)? If so, name them:

Indicate your interest level in various career areas: (0-none, 1-low, 5-high)

Business
Educ’n/teaching
Helping (counseling, soc.work, ministry)
Public sector (gov’t, policy, politics, NGO)
A Big Problem (energy, green, dev. world,. sustainability…)
Technology (business, engineering, research)
Law (corporate, criminal, etc)
Medicine (MD, drugs/devices, health admin/policy, …)

Write in your own category ideas

I really don’t know…

Anything else you’d like to add:

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APPENDIX B: FACTOR ANALYSES OF MEASURES

Career-related Negative and Positive Affect

As the negative and positive affect items were semantically related and significantly correlated (Pearson’s r = -0.49, p < .001), an exploratory factor analysis was run to determine if the underlying structure of the data had one or more different constructs. To separate underlying constructs from simple differences in wording, all of the positively worded items were first reverse-coded to be conceptually negative. An unrotated principal components analysis showed that a single factor explained 39% of the variance in the data. Two more factors had eigenvalues over one and explained a further 13% and 8% of the variance, respectively. Examination of factor loadings for each item, presented in Table B.1, suggested that the first factor related to general negative affect, such as sadness, anxiety and withdrawal. The second factor seemed to be the opposite of the first, possibly representing positive affect, with all positively-worded items loading on that factor positively. The third factor was an avoidance construct that primarily included two items about procrastination and avoidance of thoughts and actions related to career and future. A close look at the loadings, however, also showed that the items in the second and third factors also loaded on the first factor. In an effort to simplify the measure and focus on the outcome of concern – reduced well-being – a single scale was constructed that combined all fifteen items. The reliability for this final Negative Affect scale was .88 and item analyses showed that removing any single item from the scale would reduce reliability.
Appendix Table 1. *Factor loadings for all affect items*

<table>
<thead>
<tr>
<th>Item</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Negative</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I felt sad about my career and future.</td>
<td>0.75</td>
<td>-0.17</td>
<td>-0.17</td>
</tr>
<tr>
<td>I felt that difficulties related to my career and future were piling up so high that I could not overcome them.</td>
<td>0.75</td>
<td>-0.24</td>
<td>-0.13</td>
</tr>
<tr>
<td>I felt depressed about my career and future.</td>
<td>0.74</td>
<td>-0.30</td>
<td>-0.28</td>
</tr>
<tr>
<td>I felt unable to control my career and future.</td>
<td>0.68</td>
<td>-0.36</td>
<td>-0.04</td>
</tr>
<tr>
<td>I felt nervous and stressed about my career and future.</td>
<td>0.61</td>
<td>-0.34</td>
<td>0.00</td>
</tr>
<tr>
<td>I avoided thinking about my career and future.</td>
<td>0.60</td>
<td>-0.15</td>
<td>0.55</td>
</tr>
<tr>
<td>My sleep was restless when I thought about my career and future.</td>
<td>0.59</td>
<td>-0.33</td>
<td>-0.32</td>
</tr>
<tr>
<td>I procrastinated on tasks related to planning my career and future.</td>
<td>0.56</td>
<td>-0.09</td>
<td>0.60</td>
</tr>
<tr>
<td>I talked less than usual about my career and future.</td>
<td>0.52</td>
<td>-0.09</td>
<td>0.28</td>
</tr>
<tr>
<td>I had crying spells when I thought about my career and future.</td>
<td>0.51</td>
<td>-0.15</td>
<td>-0.32</td>
</tr>
<tr>
<td><em>Positive (all items reverse-coded)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I felt hopeful about my career and future.</td>
<td>0.53</td>
<td>0.64</td>
<td>-0.13</td>
</tr>
<tr>
<td>I was happy about my career and future.</td>
<td>0.63</td>
<td>0.61</td>
<td>-0.07</td>
</tr>
<tr>
<td>I felt confident about my ability to handle problems related to my career and future.</td>
<td>0.54</td>
<td>0.60</td>
<td>-0.20</td>
</tr>
<tr>
<td>I feel at ease and comfortable with where I am in making a vocational decision.</td>
<td>0.68</td>
<td>0.33</td>
<td>0.22</td>
</tr>
<tr>
<td>I'm not worried about my career choice.</td>
<td>0.65</td>
<td>0.28</td>
<td>0.10</td>
</tr>
</tbody>
</table>

*Career Development Agency*

Although self-efficacy and dysfunctional beliefs are theorized to be independent components of agency, a factor analysis was performed to examine conceptual overlaps or irregularities within the scales. This was also an important step to assess the validity of these measures, as both were designed for this study and used for the first time. An exploratory, unrotated principal components analysis resulted in two main factors. The first factor explained 29.05% of the variance in data; the second explained 10.6%.
Looking at the factor loadings (Tables B.2-B.4), it appeared that most of the items were correctly grouped into either the self-efficacy scale or the dysfunctional beliefs scale. Factor one contained all sixteen original items of the self-efficacy scale. Seven of the fourteen items from the dysfunctional beliefs scale loaded most strongly on factor two. One of the dysfunctional beliefs items loaded most strongly on factor one, but also loaded highly on factor two (“Given my experience and education to date, only a few career paths are practical for me,”). The other items in the beliefs scale related to needs for passion and priority for career over other life domains (two items) and pessimism (two items, e.g. “No one an help me figure out my career”). As the two items relating to career primacy were very similar, the item with less variance and lower face validity was removed. The two pessimistic items were also removed as they could be conflated with larger psychological issues such as depression. The remaining three items were placed within the dysfunctional beliefs scale because they had high factor loadings for factor two (though they loaded highest on other factors). The final disposition of items kept the original sixteen items on the Career Development Self-Efficacy together and added one from the Dysfunctional Beliefs scale, and reduced the items in the Dysfunctional Beliefs scale to ten. Only three were entirely removed (Table B.4). A confirmatory factor analysis (using principal components) with only the remaining 27 items and two factors, specified a priori, placed all items in the expected categories and together they explained 43.2% of the variance in scores across agency items.
### Appendix Table 2. Factor loadings for self-efficacy items

<table>
<thead>
<tr>
<th>Item</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose a career that will fit your interests.</td>
<td>.80</td>
<td>.13</td>
<td>.06</td>
</tr>
<tr>
<td>Take action to start exploring your career.</td>
<td>.76</td>
<td>.23</td>
<td>-.12</td>
</tr>
<tr>
<td>Determine the steps to take if you are having trouble with your career planning &amp; exploration.</td>
<td>.76</td>
<td>.16</td>
<td>.07</td>
</tr>
<tr>
<td>Identify some reasonable alternatives if you are unable to get your first choice of job/occupation.</td>
<td>.75</td>
<td>.10</td>
<td>.04</td>
</tr>
<tr>
<td>Choose a job to try based on a list of potential occupations you are considering.</td>
<td>.74</td>
<td>.13</td>
<td>.08</td>
</tr>
<tr>
<td>Choose a career that will fit your desired lifestyle.</td>
<td>.71</td>
<td>.06</td>
<td>.09</td>
</tr>
<tr>
<td>Persistently work at developing your career even when you get frustrated or worried.</td>
<td>.70</td>
<td>.23</td>
<td>.08</td>
</tr>
<tr>
<td>Make a plan for exploring your career over the next five years.</td>
<td>.69</td>
<td>.06</td>
<td>.26</td>
</tr>
<tr>
<td>Decide what you value most in an occupation.</td>
<td>.67</td>
<td>.16</td>
<td>.12</td>
</tr>
<tr>
<td>Identify several jobs that you are interested in actively exploring.</td>
<td>.66</td>
<td>.27</td>
<td>-.10</td>
</tr>
<tr>
<td>Use various resources (for example, the Internet, or the Career Development Center) to find information about occupations that interest you.</td>
<td>.66</td>
<td>.12</td>
<td>-.31</td>
</tr>
<tr>
<td>Identify, contact and meet with someone who is already employed in a field you are interested in.</td>
<td>.65</td>
<td>.25</td>
<td>-.17</td>
</tr>
<tr>
<td>Identify employers, firms, and institutions relevant to your career plans.</td>
<td>.65</td>
<td>.37</td>
<td>-.02</td>
</tr>
<tr>
<td>Change jobs/occupations if you are not satisfied with the one you enter.</td>
<td>.59</td>
<td>-.17</td>
<td>.20</td>
</tr>
<tr>
<td>Define the type of lifestyle you would like to live.</td>
<td>.53</td>
<td>.07</td>
<td>.17</td>
</tr>
<tr>
<td>Take a job without knowing whether it is the perfect job for you.</td>
<td>.47</td>
<td>-.13</td>
<td>-.16</td>
</tr>
<tr>
<td>Given my experiences and education to date, only a few career paths are practical for me.</td>
<td>-.55</td>
<td>.27</td>
<td>-.09</td>
</tr>
</tbody>
</table>
Appendix Table 3. Factor loadings for dysfunctional beliefs items

<table>
<thead>
<tr>
<th>Item</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>I should be sure of my professional plans and goals before I do anything.</td>
<td>-.40</td>
<td>.60</td>
<td>.10</td>
</tr>
<tr>
<td>If I make a good decision now, I will not have to change my career later in life.</td>
<td>-.31</td>
<td>.60</td>
<td>.03</td>
</tr>
<tr>
<td>By the time I’m 25 years old, I will have figured out the questions that I’m struggling with now.</td>
<td>-.02</td>
<td>.56</td>
<td>.06</td>
</tr>
<tr>
<td>It is important that I make a serious, long-term decision about my career.</td>
<td>-.33</td>
<td>.55</td>
<td>.08</td>
</tr>
<tr>
<td>My career will be determined by the choices I make now.</td>
<td>-.35</td>
<td>.54</td>
<td>-.22</td>
</tr>
<tr>
<td>College graduates should know what they want to do with their lives.</td>
<td>-.21</td>
<td>.51</td>
<td>-.10</td>
</tr>
<tr>
<td>If I make a mistake in choosing an occupation, it will have serious long-term consequences.</td>
<td>-.47</td>
<td>.45</td>
<td>-.10</td>
</tr>
<tr>
<td>Trying out different occupations is uninteresting.</td>
<td>-.10</td>
<td>.43</td>
<td>.51</td>
</tr>
<tr>
<td>Trying out different occupations is frightening.</td>
<td>-.28</td>
<td>.37</td>
<td>-.24</td>
</tr>
<tr>
<td>My job/career should be the most important part of my life.</td>
<td>.00</td>
<td>.26</td>
<td>.04</td>
</tr>
</tbody>
</table>

Appendix Table 4. Factor loadings for removed items

<table>
<thead>
<tr>
<th>Item</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinking deeply about myself and my future will not help me with my career.</td>
<td>-.31</td>
<td>-.04</td>
<td>.66</td>
</tr>
<tr>
<td>No one can help me figure out my career.</td>
<td>-.25</td>
<td>.26</td>
<td>.42</td>
</tr>
<tr>
<td>I should be passionate about my job/career.</td>
<td>.07</td>
<td>.20</td>
<td>-.47</td>
</tr>
</tbody>
</table>

Career Development Behaviors

The items were treated as a scale containing 12 items because all the items were theoretically assumed to stem from a unitary motivation, that is, to take action on one’s own career development. To test of this assumption, an exploratory factor analysis was run with no rotation. The result was three factors with eigenvalues greater than one. As shown in Table 4.15, all of the items did load positively on the first factor, which by itself explained 33.9% of the variance in scores. Three items also loaded on two other factors, which contributed 12.0% and 9.3% of the variance, respectively. These second factor seemed to concern action versus contemplation (the “applied for a job/internship” item
and the “reflect through journal or meditation” items loaded strongly and in opposite directions). The third factor had only the item related to volunteering in a field of occupational interest loading highly. As the theoretical focus of the scale was taking action towards career development, I did not want to conflate career development with independent interests in meditation or volunteering. In the final scale, the reflection and volunteering items were taken out.

Appendix Table 5. Factor loadings for career development behaviors

<table>
<thead>
<tr>
<th>Item</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted an informational interview</td>
<td>.76</td>
<td>-.19</td>
<td>.08</td>
</tr>
<tr>
<td>Created a personal or professional 5-year plan</td>
<td>.73</td>
<td>.16</td>
<td>.07</td>
</tr>
<tr>
<td>Networked (e.g. emailed a contact, met new people who could help you professionally)</td>
<td>.68</td>
<td>.01</td>
<td>.28</td>
</tr>
<tr>
<td>Wrote, practiced or gave an elevator speech</td>
<td>.67</td>
<td>.14</td>
<td>.15</td>
</tr>
<tr>
<td>Did a self-assessment (such as a personality or career interest test)</td>
<td>.63</td>
<td>.12</td>
<td>-.08</td>
</tr>
<tr>
<td>Met with a career counselor</td>
<td>.58</td>
<td>-.38</td>
<td>-.12</td>
</tr>
<tr>
<td>Used the Career Development Center’s resources (e.g., job guides or the Career library)</td>
<td>.57</td>
<td>-.44</td>
<td>-.43</td>
</tr>
<tr>
<td>Found or met with a professional mentor</td>
<td>.51</td>
<td>.39</td>
<td>.21</td>
</tr>
<tr>
<td>Learned about careers or occupations (e.g., through Internet research)</td>
<td>.50</td>
<td>.22</td>
<td>-.53</td>
</tr>
<tr>
<td>Applied for an internship or job</td>
<td>.47</td>
<td>-.63</td>
<td>.16</td>
</tr>
<tr>
<td>Journaled, meditated or did other forms of self-reflection</td>
<td>.44</td>
<td>.64</td>
<td>-.27</td>
</tr>
<tr>
<td>Volunteered in a field of occupational interest</td>
<td>.24</td>
<td>.09</td>
<td>.62</td>
</tr>
</tbody>
</table>
APPENDIX C: DESIGN THINKING MEASURE

Page 1
For the following question, imagine that you are a product designer. Your company wants to design new products for beach-goers, and have given you a photo of their potential customers to get you started.

Spend some time examining this picture, in preparation for designing new products for beach-goers. Go on to the next page when you are ready.

Page 2
Now, please write down everything you remember about the photo you just saw, even if what you remember seems unimportant or irrelevant.

Please do not use the "Back" button. Only write down what you remember right now.

Page 3
Finally, what new products can you imagine for beach-goers like those in the photo?

Take a few minutes to write down all your ideas, even if they seem weird or impractical to you.

You can press enter or return, or use punctuation to separate your ideas. You can write as much as you want -- the box will expand to fit your response.
Thank you for participating in this research study! The following questionnaire should take 10-15 minutes. Please give yourself enough time to complete it in one session; however, if necessary, you can save it and come back later.

CONSENT FORM
For questions about this study, please contact Lindsay Oishi at the Stanford School of Education. Her address is Wallenberg Hall/Building 160, 4th floor, 450 Serra Mall, Stanford, CA, 94305-2055, and she can be contacted at (808) 489-1186 or LOishi@stanford.edu.

You are invited to participate in a research study on how students think about their future lives and careers, and how this may affect their self-confidence, sense of purpose, self-efficacy, and beliefs about work. Participation in the study entails completing an online questionnaire that will take about 15 minutes; some participants will be asked to complete this questionnaire twice (before and after the course if you are enrolled in ME104, ME104B, ME 304, E311B, or a related SGSI course). The questionnaire concerns your personal beliefs and feelings about yourself, your future career, and other personal issues.

We hope to learn about how students who take a class or workshop in design thinking and other tools may learn to apply this point of view to their future careers. Though you may or may not participate in this class or workshop, your input will help us to understand the needs of students who face important decisions about their future work and lives.

If you are a workshop or class participant, we would also like to use your in-class activities and assignments as anonymous data in our study. This includes notes and observations taken by instructors or other staff and your homework assignments.

Your participation in this study is entirely voluntary. All of your responses will be coded with an Identification Number (ID), and since you will not provide your name or other specific individually identifying information, your individual privacy will be preserved.

Risks and Benefits:
There are no foreseeable risks or benefits associated with participation in this study.
you do not wish your responses to questionnaires to be used as data for research, please
do not participate in this study. If at any time during the study you find it distressing to
continue, you can stop and contact the researcher for assistance. Your decision about
whether or not you participate in this study and your responses will not affect your
academic standing, grades in school or employment. We cannot and do not guarantee or
promise that you will receive any benefits from this study.

**Time Involvement:** Your participation in this experiment will take approximately fifteen
to thirty minutes, though you are free to spend as much or as little time answering the
questions as you want.

**Payments:** You will not be paid for your participation in this study, beyond a small token
of our appreciation (a gift certificate worth $5).

**Subject’s Rights:** If you have read this form and have decided to participate in this
project, please understand your participation is voluntary and refusal to participate will
involve no penalty or loss of benefits to which you are otherwise entitled. You also have
the right to withdraw your consent or discontinue participation at any time without
penalty or loss of benefits to which you are otherwise entitled. Withdrawal from the study
will have no adverse consequences whatsoever. You have the right to refuse to answer
individual questions. Your individual privacy will be maintained in all published and
written data resulting from the study.

**Contact Information:**
Questions, Concerns, or Complaints:
*If you have any questions, concerns or complaints about this research study, its
procedures, risks and benefits, or your rights as a subject, you should contact the Protocol
Director, Lindsay Oishi. You may contact her now or later at (808) 489-1186 or
LOishi@stanford.edu.
Emergency Contact:
*If you feel you have been hurt by being a part of this study, or need immediate
assistance, please contact the Protocol Director, Lindsay Oishi. You may contact her now
or later at (808) 489-1186 or loishi@stanford.edu. You can also contact the Faculty
Sponsor, Professor Daniel Schwartz, at danls@stanford.edu.
Independent of the Research Team Contact:
*If you are not satisfied with the manner in which this study is being conducted, or if you
have any concerns, complaints, or general questions about the research or your rights as a
research study subject, please contact the Stanford Institutional Review Board (IRB) to
speak to an informed individual who is independent of the research team at (650)-723-
2480 or toll free at 1-866-680-2906. Or write the Stanford IRB, Administrative Panels
Office, Stanford University, Stanford, CA 94305, 5401. In addition, please call the Stanford IRB at (650)-723-2480 or toll free at 1-866-680-2906 if you wish to speak to someone other than the research team or if you cannot reach the research team.

Please understand that participation in this research is entirely voluntary. If you have read the above and consent to participate in this study, please check the box below that indicates your consent. To keep a copy of this consent form, please print this page, or contact Lindsay Oishi at loishi@stanford.edu to have an electronic version sent to you.

Protocol Approval Date: 05/12/2010
Protocol Expiration Date: 04/29/2011

Please read and check the boxes below.

I consent to participate in this study.
I consent to be contacted by email in the future for follow-ups to this study.

Page 3

Are you a....

Freshman
Sophomore
Junior
Senior
Master's student
PhD student
Other

Are you currently taking, or have you previously taken, ME104B, Designing Your Life?

Yes
No
Other (please explain):

So that we can identify you uniquely (but NOT by name or any other identifying information): what is your birthdate? (Month Day, Year format: e.g. January 1, 1980)

Page 4

How did you find out about this survey? (Please check all sources if you received more than one invitation)

Residence or dorm
Fraternity or sorority
Class (e.g., ME101)
Sports team
Student group
Other:

Page 5

Have you decided on an occupation? Think about it for a moment, then check…
a) I have an occupational field in mind that I want to work in (for example, medicine, engineering, management or the performing arts).
b) I have decided on an occupation I want to enter (for example, electrical engineer, nurse, or designer).
   Strongly Disagree
   Disagree
   Neither Agree nor Disagree
   Agree
   Strongly Agree

How do you feel about where you are in the process of making a choice?
a) I feel at ease and comfortable with where I am in making a vocational decision.
b) I’m not worried about my career choice.
   Strongly Disagree
   Disagree
   Neither Agree nor Disagree
   Agree
   Strongly Agree

Page 6

For the following statements, please indicate whether you agree or disagree.
   Strongly Disagree
   Disagree
   Neither Agree nor Disagree
   Agree
   Strongly Agree

College graduates should know what they want to do with their lives.
By the time I’m 25 years old, I will have figured out the questions that I’m struggling with now.
It is bad that I am not sure about my career at this time in my life.
If I make a mistake in choosing an occupation, it will have serious long-term consequences.
It is important that I make a serious, long-term decision about my career.
My career indecision is a problem.
I should be passionate about my job/career.
My job/career should be the most important part of my life.
If I make a good decision now, I will not have to change my career later in life.
Trying out different occupations is uninteresting.
Trying out different occupations is frightening.
No one can help me figure out my career.
I should be sure of my professional plans and goals before I do anything.
My career will be determined by the choices I make now.
Given my experiences and education to date, only a few career paths are practical for me.
Thinking deeply about myself and my future will not help me with my career.
I lack confidence because I don’t know what my occupation will be.

**Page 7**

For each item, please indicate whether it is true for you at this time in your life.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

I have many decisions to make about my life overall.
I have many decisions to make related to my career.
I or someone close to me is facing a significant health problem.
Graduation is coming up soon.
Most of my friends have made decisions about their careers.
Most of my friends have already gotten jobs or job offers.
I or someone close to me is facing significant financial difficulties.
The job market right now is really tough.
Unemployment is high right now.
My family frequently asks what I am planning to do after college.

**Page 8**

The items below refer to how you have felt and behaved during the last month.

Please think about how you have felt and behaved when thinking about your career and professional future specifically.

*Less than once in the past month*
Once in the past month
2-3 Times in the past month
Once a Week
2-3 Times a Week
Daily

I had crying spells when I thought about my career and future.
I thought my life had been a failure.
I was happy about my career and future.
I felt that I was just as good as other people.
I talked less than usual about my career and future.
I felt confident about my ability to handle problems related to my career and future.
I felt sad about my career and future.
I felt hopeful about my career and future.
I procrastinated on tasks related to planning my career and future.
I avoided thinking about my career and future.
My sleep was restless when I thought about my career and future.
I decided not to think about my career and future at all.
I felt nervous and “stressed” about my career and future.
I felt depressed about my career and future.
I felt that difficulties related to my career and future were piling up so high that I could not overcome them.
I felt unable to control my career and future.

Page 9

Please indicate how many times you have done each of the items during the most recent academic quarter.
Not during the most recent academic quarter.
Once
Twice
3 or more times

Conducted an informational interview
Did a self-assessment (such as a personality or career interest test)
Applied for an internship or job
Volunteered in a field of occupational interest
Networked (e.g. emailed a contact, met new people who could help you professionally)
Wrote, practiced or gave an elevator speech
Journaled, meditated or did other forms of self-reflection
Learned about careers or occupations (e.g., through Internet research)
Used the Career Development Center’s resources (e.g., job guides or the Career library)
Met with a career counselor
Found or met with a professional mentor
Created a personal or professional 5-year plan

Page 10

How sure (confident) are you that you could...

- Very unsure
- Unsure
- Neutral
- Sure
- Very sure

Choose a job to try based on a list of potential occupations you are considering.
Persistently work at developing your career even when you get frustrated or worried.
Take a job without knowing whether it is the perfect job for you.
Identify some reasonable alternatives if you are unable to get your first choice of job/occupation.
Use various resources (for example, the Internet, or the Career Development Center) to find information about occupations that interest you.
Choose a career that will fit your desired lifestyle.
Determine the steps to take if you are having trouble with your career planning & exploration.
Take action to start exploring your career.
Identify several jobs that you are interested in actively exploring.
Identify, contact and meet with someone who is already employed in a field you are interested in.
Define the type of lifestyle you would like to live.
Change jobs/occupations if you are not satisfied with the one you enter.
Choose a career that will fit your interests.
Identify employers, firms, and institutions relevant to your career plans.
Make a plan for exploring your career over the next five years.
Decide what you value most in an occupation.

Page 11

The following questions help us to understand the general class characteristics and compare our class to other similar students. Your private identifying data will NOT be
associated with your name, nor will it be released in any way that can be used to identify you.

In both college and graduate school, how many classes on DESIGN, DESIGN SKILLS, or DESIGN THINKING have you taken (not counting ME104B or E311B)?
   None
   1
   2
   3
   More than 3

During the most recent academic quarter, how often did you participate in a volunteer or community service group or activity? (Select the answer closest to what you actually did)
   Never
   About once a month
   About once every 2 weeks
   Once a week
   More than once a week

Did you play for a Stanford varsity athletic team in the most recent academic quarter?
   Yes
   No

Have you ever done any of the following activities with the Career Development Center (CDC) at Stanford? (Select all that apply)
   Had a 15 minute appointment with a career counselor
   Had a 45 minute appointment with a career counselor
   Registered for the Stanford Alumni Mentoring program (SAM)
   Other

What is your gender?
   Male
   Female

How would you identify your race/ethnicity? Please check all that apply.
   African / African American
   East Asian / Asian American
   South Asian / Indian
   Hispanic / Latino
   Native American / Alaskan Native
   Pacific Islander
White (non-Hispanic)
Other

Where did you go to high school (or equivalent international secondary education)? (e.g. City, State or Country)

What is your intended or current major or field of study? (If undecided, write "Don't know").

What was your GPA at the end of last quarter? (in numerical format, e.g. 3.20)

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Thank you so much for your participation! If you would like to receive a $5 gift for you in cash (via PayPal) or gift card from Amazon, Starbucks or Jamba Juice, please select your gift below.

I would like:

Cash (valid PayPal account required)
Amazon.com (sent by email)
Starbucks (sent by regular mail)
Jamba Juice (sent by regular mail)
REFERENCES


Nussbaum, B. (2011). Design Thinking is a Failed Experiment, So What’s Next? [accessed online at http://www.fastcodesign.com/1663558/]


Tanner, J., & Yabiku, S. (1999). Conclusion: The economies of young adulthood: One future or two? In A. Booth, A. C. Crouter & M. J. Shanahan (Eds.), *Transitions to


