MEETING THE CHALLENGE:

AN EXPLANATORY STUDY OF THE TRANSFORMATIONS IN SELF-EFFICACY

AND LEARNING ORIENTATIONS OF FIRST TIME MARATHONERS

by

Bernadette L. Carson

B.S. 1981, Polytechnic Institute of New York, Farmingdale NY

M.S. 1990, Florida Institute of Technology, Patuxent River, MD

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Dissertation Chair

Dr. Michael Marquardt

Dissertation Committee

Dr. Neal Chalofsky

Dr. Dennis Gallagher

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ABSTRACT

This mixed method study examines the non-physical changes that first-time

marathoners experience. Changes in general self-efficacy (Bandura & Adams, 1977;

Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982) and goal

orientation (Button, Mathieu, & Zajac, 1996) were measured using Sherer's General Self

Efficacy scale and Button et al.'s goal orientation instrument. Learning transformations

(Boyd, 1991; Mezirow, 1995; Mezirow & Marsick, 1978) were explored through semi-

structured interviews.

In the quantitative portion of the study, participants completed a pre-survey within

two weeks of registering for their first marathon; a post-survey was completed two to

three weeks after the completion of the marathon. One-hundred ninety three individuals

completed the pre-survey. Of the 104 participants whose marathon dates had passed at

the time the post-survey was administered, 79 completed the post-survey. Participant

selection for interviews was conducted to ensure that the broadest personal characteristics

were considered. A total of 21 interviews were conducted.

Based on this study, the following conclusions were drawn: 1) changes in self-

efficacy between the time of commitment to a new task and the time the new task is

completed are minimal; 2) planning is important to increased self-efficacy; 3) personal

forgiveness is important to increased self-efficacy; and 4) emergent transformative

learning is general. Further, this study revealed the longitudinal nature of changes in self-

efficacy and goal orientation in which the greatest changes occur before a commitment to

a challenge is made. Future research could further explore this longitudinal aspect of self-

efficacy.

# DEDICATION

This dissertation is dedicated to my mother. Several years ago, my mother paid me the deepest complement – simply - I was everything she should have been. Not only have I achieved everything she should have – but I have also achieved everything she could have.

## ACKNOWLEDGEMENTS

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## INTRODUCTION

### Overview

Vaill (1996) uses the metaphor of permanent white water to describe the rapidly

changing environment we now live and work in. He describes this permanent white water

as a condition of life. It is full of surprises, it is novel, and it is often "messy". This white

water condition is ill structured and frequently costly. At the very least, it is obtrusive and

recurring. To survive in today's world or permanent white water organizations must

develop an environment that supports the continuous learning and development of their

employees. This daunting challenge that organizations face is similar to the challenge

first time marathoners face as they seek out and develop their learning environment that

ensures the completion of their marathon.

Both the organization and the marathoners must continually learn and adjust their

strategy to achieve their ultimate goal. For the organization, this means having a plan that

includes learning and development that will lead the organization to realizing their vision.

For the marathoner this means having a training plan that will prepare them for the

marathon. However, for both the environment is constantly changing. For each, they need

to continually learn to transform themselves to achieve their goal.

In the book *First Marathons*, Kislevitz (1998) documented 37 stories of the

transformative experiences that occurred when individuals completed the marathon

challenge. Most individuals never considered completing an endurance event. According

to American Sports Data (2000), 435,000 Americans participated in a marathon in 1999.

This represents less than 1% of Americans who consider themselves runners. However,

these numbers are significantly up from 15 years ago. According to a report for Road Race Participation from the USATF Road Running Information Center, the number of runners has doubled over this period (Carson, 2001).

As Retherford (2001) indicated, "Transformational learning is an emerging field of study, somewhat lacking in clarity and definition" (p. 1). Further, Taylor (1998) raised many questions around the nature of the trigger events leading to transformative learning. Why is it that some events that seem to qualify as a crisis do not cause a transformative learning whereas other apparently mundane events do?

Initial research that this researcher (Carson, 2004) has conducted on the transformation experienced by first-time marathoners indicates they experience both a change in self-efficacy and a change in goal orientation. The participants in that study indicated that they felt much more capable as a result of their marathon experience (Carson, 2004). They viewed this change as more than just an increase in how capable they felt about themselves—they felt transformed in how they approach all aspects of life. Initial indications are that this transformation is emergent in nature. The participants also identified a change in how they approached goals in their lives. Whether an individual completes the race in 2.5 hours or in 10 hours, they have won the race and, in doing so, have experienced transformations in both perspective and self-efficacy.

Since, the terms self-efficacy, self-confidence, and self-esteem are frequently interchanged in everyday communication. For purposes of this study, self-efficacy is defined as how effective and individuals feel they will be when taking on a new challenge; self-confidence is how sure they are that they will successfully complete the task; and self-esteem is their self-worth (Bandura, 1977, 1986, 1997). To illustrate – an

executive is laid off from his high profile position during a corporate downsizing. Given the need to make ends meet, he takes a position as a used cars salesman. He knows he has the skills necessary to sell cars – therefore he has good self-efficacy in terms of selling cars. He knows selling cars depends on many factors other than his raw ability to sell car – such as the economy – therefore his self-confidence tends to fluctuate with the other factors. He views selling cars as a demeaning job – therefore his self-esteem is low.

Self-efficacy has been studied in terms of task specific self-efficacy (Bandura, 1977) and general self-efficacy (Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982). Task specific self-efficacy is how effective individuals feel they are given a specific task; where general self-efficacy is how effective they feel they are in most situations. Successfully, completing tasks leads to higher task specific self-efficacy for the task, and contributes to increased general self-efficacy. Successful marathoners consistently speak of the empowerment they feel as a consequence of completing the marathon – that completing the marathon makes them feel that they can effectively take on any challenge.

The marathon is more than the act of completing the race on the day of the event. It also includes all the training, planning, and patience necessary in order to be successful. Because of this, the marathon can be used as a metaphor for any event in life that takes long-term planning and commitment to be successful. For organizations, this is meeting the challenge of the staying ahead of the changing environment to achieve the corporate vision. Another example of where this level of daunting challenge is taken on and achieved is in the Executive Leadership Program at the George Washington University. The Executive Leadership Program is a doctoral program designed to

complete all of the coursework over the course of two years. Students learn to accept that the key to successfully completing the program is learning along the way - not coming into it with all the answers.

<center>Statement of Problem</center>

Organizations are faced with the daunting challenge of how to keep ahead of the changing environment on a daily basis while still keeping the employees focused on the corporate vision. Similarly, the marathoner is faced with the daunting challenge of how to adjust their training to ultimately complete the marathoner. Given this, the number of individuals that are currently training for and completing marathons is astounding. The numbers have grown at an astounding rate. In 1976, only 25,000 individuals had completed marathons, but by 1980, the number had risen to 120,000. In the next decade, that number more than doubled to 260,000. By 2000, the number had increased to 450,000. Understanding the positive transformations—both increased self-efficacy and an increase in learning orientation—that individuals experience upon completing a marathon can be used to help organizations understand how to meet the challenge of achieving their visions in today's tumultuous white water environment through learning and training programs that transform employees through positive increases in self-efficacy and learning orientation.

Several gaps exist in the transformative learning literature. First, to date, no formal research has been done to understand the learning transformation that is experienced by the first-time marathoner. Second, current research (Gist & Mitchell, 1992) has indicated that individuals with a high learning orientation also demonstrate high self-efficacy. However, there has been no research exploring the impact of

increasing general self-efficacy on learning orientation. An understanding of this cyclic nature – that is increased general self-efficacy leading to increased learning orientation and increased learning orientation leading to increased general self-efficacy - has the potential to be expanded into additional areas, such as corporate training programs. Given that a higher learning orientation leads to higher self-efficacy, understanding how it can be improved holds significant value. Specifically, if through training, individuals' learning orientation can be improved; organizational studies can focus on training needs that encourage a learning orientation which leads to increased self-efficacy, which in turn leads to an increase in learning orientation.

Finally, sufficient research has not been conducted to explore the emergent nature of transformative learning; nor has any research been conducted to understand the influence of changing self-efficacy on transformative learning.

Purpose

This research sought to understand the nature of the transformative learning experienced by first-time marathoners - first, by quantifying the changes experienced by first-time marathoners in terms of changes in general self-efficacy and in goal orientation; then by exploring the nature of this change. For goal orientation, both learning orientation and performance orientation were measured. Although learning orientation was the primary measure of interest, both measures were evaluated. Based on these changes, this research sought to explore how the participants thought they had transformed as a result of participating in the marathon training and event.

Research Questions and Hypotheses

*Research Questions*

1. What change in self-efficacy do individuals realize by virtue of training for and completing a marathon as measured by Sherer's (1982) General Self-Efficacy (GSE) instrument?

2. What change in goal orientation do individuals realize by virtue of training for and completing a marathon as measured by Button, Mathieu, and Zajac's (1996) Goal Orientation instrument?

3. What is the relationship between the change in self-efficacy and the change in goal orientation?

4. What is the relationship between an individual's reason for taking on the challenge of the marathon and their goal orientation?

5. How do first-time marathoners think their perspective has transformed by virtue of training for and completing their first marathon?

*Hypotheses*

$H_1$: By training for and completing their first marathon, individuals will experience a significant increase in self-efficacy (as measured by Sherer's (1982) General Self-Efficacy instrument) between the time when they begin training for the marathon and 14–21 days after completing the marathon.

$H_{1a}$: Individuals with an initial high score on the self-efficacy scale and a high performance orientation will experience significantly less change in self-efficacy than those with either an initial low self-efficacy score or a low performance orientation.

$H_{1b}$: Individuals with a high initial learning orientation will experience a significantly greater increase in self-efficacy than those with a low initial learning orientation.

$H_2$: By training for and completing their first marathon, individuals will experience a significant increase in learning orientation as measured by Button et al.'s (1996) Goal Orientation instrument.

$H_{2a}$: Individuals with slower completion times will show significantly higher learning orientations than those with faster completion times.

$H_{2b}$: Individuals with faster completion times will show significantly higher performance orientations than those with lower completion times.

$H_{2c}$: Older individuals will show significantly higher learning orientations than younger individuals.

$H_{3a}$: Those with a low desire for a specific completion time will show a significantly higher learning orientation than those with a high desire for a specific completion time.

$H_{3b}$: Those with a high desire for a specific completion time will show a significantly higher performance orientation than those with a low desire for a specific completion time.

<div align="center">Statement of Potential Significance</div>

Understanding how individuals' change in terms of self-efficacy and goal orientation when undertaking a monumental task will add to the literature from several perspectives. There have been studies that have indicated that goal orientation affects self-efficacy (Phillips & Gully, (1997); however, there has not been any work to study if

there is a relationship in the opposite direction. This study adds to the goal orientation and self-efficacy literature, as well as to the literature that looks to understand the relationship between the two constructs by quantifying how these values change when individuals take on a task that takes long term training and planning.

The literature on goal orientation will be expanded through determining the correlation between goal orientation and reason (motivating factor) in taking on the challenge. By understanding the link between what motivates an individual to take on a challenge and his/her goal orientation, specific training programs can be designed to improve individuals' learning orientation. Subsequently, programs can be developed to target the factors that entice individuals to take on monumental goals.

Moreover, given the propensity of stories that exists of the transformation experienced by first time marathoners, understanding this transformation and how it links to changes in self-efficacy and goal orientation will expand the transformative learning literature. By understanding, how the successful marathoner is transformed – specifically in terms of self-efficacy and goal orientation - through the course of training for and ultimately completing the marathon will help organizations understand how they can meet the challenge of surviving in the ever changing environment. They will also be able to use the information gathered concerning motivation and goal orientation to modify their training programs to meet the broader needs of group participants. This study will aid any organization that needs to motivate people to accomplish a major task.

Conceptual Framework

The conceptual framework for this study focused on the self-efficacy, goal orientation, and transformative learning that individuals experience upon completing their

first marathon. Running a marathon takes a considerable amount of determination, planning, and, one would presume, self-efficacy, since, as Bandura (1997) indicates, in order to attempt a challenging event an individual needs to have a high self-efficacy. Yet, after individuals have completed their first marathon, they have consistently spoken of a feeling of transformation (see Bingham, 1999; Greene & Winfrey, 1996; Kislevitz, 1998; Reti & Sien, 2003).

This study examined three constructs: self-efficacy as defined by Bandura (1977) and Sherer (1982); goal orientation as defined by Dweck (1986) and refined by Button, Mathieu, and Zajac(1996); and transformative learning as defined by Mezirow (1978) and Boyd (1991).

Self-efficacy

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┌─────────────────────────────────────┐
│     General self-efficacy measure    │
└─────────────────────────────────────┘
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Perspective Transformation
(Peak Experience)

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┌─────────────────────────────────────┐
│       Marathon Preparation and       │
│              Experience              │
│                                      │
└─────────────────────────────────────┘
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Goal Orientation

```
┌─────────────────────────────────────┐
│       Learning orientation           │
│                                      │
│       Performing orientation         │
└─────────────────────────────────────┘
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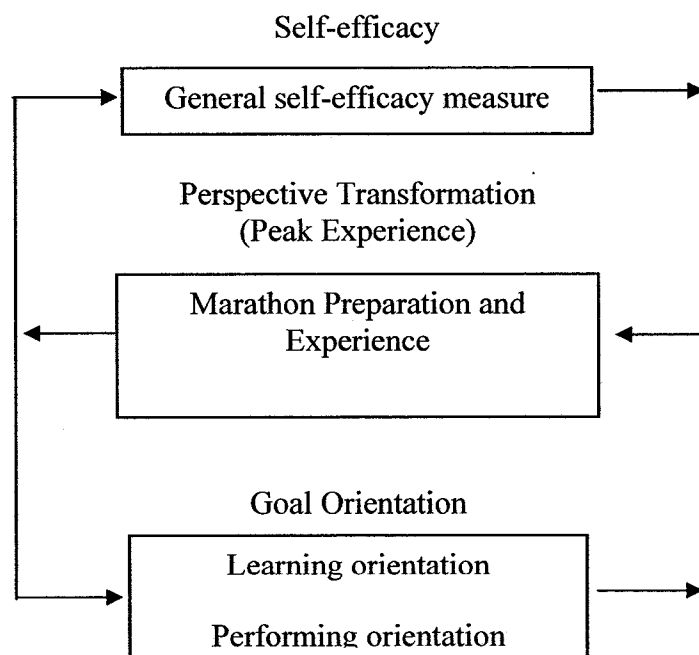
Figure 1. *Conceptual framework.*

Self-efficacy is the belief in oneself to accomplish something (Bandura, 1997). Bandura (1977) first introduced the concept of self-efficacy in terms of task specific self-efficacy. This is the belief someone has that he or she will be able to accomplish a specific task. Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982) expanded this to a concept of general self-efficacy.

Goal orientation describes how individuals interact with and react to their environment. From the learning orientation, the individual is primarily concerned with mastering the skills necessary to accomplish the task. From the performance orientation, the individual focuses on winning, on beating the competition. Dweck's (1986) seminal work conceptualized these as opposite ends of a single dimension. The work of Button et al. (1996) revealed that these were actually two distinct dimensions.

Mezirow first introduced the concept of transformative learning in 1978. For Mezirow et al. (2000), transformation involved a "fundamental reordering of assumptions" (p. 139). They went on to say transformative learning was learning where a learner "came to a new understanding of something that caused a fundamental reordering of the paradigmatic assumptions she held about the idea or action concerned" (p. 140). Boyd (1991) expanded the concept of transformative learning to include emergent transformation. According to Maslow (1987), individuals are transformed through new insights during peak experiences. Peak experiences are by definition positive in nature. Transformative learning experiences, on the other hand, can be either positive or negative.

There is a cyclic nature to this conceptual frame (Figure 1) in that an individual starts with a degree of general self-efficacy and a goal orientation. Then, by virtue of training for and completing a marathon, they experience a transformative learning. This transformative learning is realized in terms of increased self-efficacy and an increase in learning orientation.

## Summary of Methodology

A mixed method design, employing both quantitative and qualitative techniques, was utilized in this study. The study was conducted in two phases. The first phase was quantitative. Participation in this phase of the study was open to all individuals who were preparing for their first marathon. Participants were required to fill out the initial instrument within two weeks of signing up for a marathon (the assumption was that registering for the marathon and the start of training would coincide) and the follow-up instrument between two and three weeks of completing the marathon. Permission had been secured from *Psychological Reports* to use Sherer's (1982) General Self-Efficacy instrument and from Mathieu (2004) to use Button et al.'s (1996) Goal Orientation instrument. A demographic instrument (Appendix B) was used to collect such information as age, marathon to be completed, marathon date, and anticipated completion time. Correlation analysis was performed to determine the relationship between initial goal orientation and change in self-efficacy, change in self-efficacy and post marathon goal orientation, and post marathon goal orientation and change in self-efficacy.

Phase 2 was qualitative. Follow-up interviews were conducted with 21 of the participants from phase 1. To ensure the broadest cross section of participants was included in phase 2 of the study, each goal orientation score was divided into three equal

groups (tertiary split). These groups were categorized high, mid, and low. Participants were included in the interviews that scored either high on both scales, low on both scales, or high on one scale and low on the other. Additionally, individuals were selected to ensure that individuals from each category of "reason for doing the marathon" were represented (see Appendix B).

Instruments were predominately delivered via email (postal mail was used when participants could not access attachments via email). For phase 1, SPSS was used to analyze the data collected. The interview protocols for phase 2 were distributed in the same fashion as in phase 1. Interviews were conducted via telephone. The process for analyzing data described by Creswell (2003) was employed for phase 2. A more detailed outline of the research design, data collection, and data analysis are presented in chapter 3.

### Delimitations and Limitations of the Study

The delimitations and limitations of this study include the following:

#### *Delimitations*

- Only individuals who complete the marathon were included in the study.

- Individuals of all abilities were included in the study.

- Self-efficacy was measured using Sherer's (1982) General Self-Efficacy instrument.

- Goal orientation was measured using Button et al.'s (1996) Goal Orientation instrument.

- Only the psychological transformations experienced were investigated.

*Limitations*

- It was assumed that the participants filled out the instrument in a timely fashion.

- There was a risk of loss of participants between the pre-survey and the post-survey.

- Because of the self-reporting nature of the instruments, participants may not have responded completely accurately.

- Because participation in the marathon was purely voluntary, a pure experimental design with random assignment was not possible. As a result, one of the most significant limitations was the lack of generalizability.

- Because of the elapsed time between the pre- and post-surveys, it was potentially possible that other factors influenced the measured changes.

- Determining a cause and effect relationship between self-efficacy and goal orientation could not be accomplished.

- Phase 2 has the same limitation as all qualitative research. Specifically, the findings could be subject to other interpretations.

Definitions of Key Terms

For purposes of this study, the following definitions of key terms are used throughout this document.

**Goal orientation** – the approach an individual uses when faced with a new goal.

    **Learning (mastery) orientation** – the primary focus when exposed to new tasks is to master the new concept.

    **Performing (proving) orientation** – the primary focus when exposed to a new

task is to gain approval for success.

**Avoiding orientation** – the primary focus when exposed to a new task is to avoid

disapproval for failure.

**Individuation** – the discovery of new talents, a sense of empowerment and confidence, a

deeper understanding of one's inner self and greater sense of self-responsibility (Boyd,

1991).

**Meaning perspectives** – are frames of reference, defining an individual's world-view.

**Epistemic** – the use of knowledge.

**Sociolinguistic** – social and linguistic impacts on understanding.

**Psychological** – how individuals feel about themselves.

**Meaning schemes** – are "made up of specific knowledge, beliefs, value judgments, and

feelings that constitute interpretations of experience" (Mezirow, 1991).

**Self-confidence** – the belief someone has that he or she will be successful at a task.

**Self-esteem** – an individual's sense of value or self-worth. The extent to which a person

likes, values, or appreciates him or herself. Self-esteem is not a predictor of performance

(Bandura, 1997).

**Self-efficacy** – the belief in one's self to accomplish something, because one possesses

the capability to determine and execute the proper course of action (Bandura, 1997).

**General self-efficacy** – a general set of expectations that an individual has that

influences their expectations in new situations.

**Task specific self-efficacy** – the belief someone has that he or she will be able to

accomplish a specific task.

**Transformative learning (Perspective Transformation)** – "a deep, structural shift in

basic premise of thoughts, feelings, and actions . . . a shift of consciousness that dramatically and permanently alters our way of being in the world" (OISE, 2004).

<div align="center">Summary of Chapters</div>

This dissertation provides a methodology and a framework for describing the role of changes in self-efficacy and goal orientation in transformative learning. In chapter 2, the researcher reviews the literature that was instrumental in providing a theoretical formulation for answering the research questions of this study. This includes a review of the self-efficacy literature, the goal orientation literature, and the transformative learning literature. A review of the peak experience literature is included with the transformative learning literature. Additionally, the literature linking these constructs is also reviewed.

Chapter 3 introduces the methodology used to study the research questions. This includes a discussion of the two phases of the explanatory approach that are utilized. This section also includes a description of the research participants, as well as the data collection methods used in both phases. Chapter 4 presents the results of the research. This includes the appropriate charts, tables, analysis, and synthesis of data. The research questions are used to fully explore the data and to provide a guide for reporting the findings of the study. Chapter 5 provides a summary of the main findings and a discussion of the interpretation of these findings. This chapter also includes a synthesis of the data as it relates to the literature discussed in chapter 2, as well as the researcher's conclusions and recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of the relevant literature and research on: (a) self-efficacy, (b) goal orientation, and (c) transformative learning. Self-efficacy is reviewed from the seminal works of Bandura (1977), through the general self-efficacy theories of Sherer (1982), to recent studies that have investigated self-efficacy. Goal orientation is reviewed from the seminal work of Dweck (1986), through the clarification of the goal dimensions by Button (1996), to recent studies that have investigated goal orientation. Transformative learning is reviewed from the seminal work of Mezirow (1978), through the introduction of emergent transformative learning, to the studies that have specifically investigated transformative learnings associated with running. Finally, the literature that links goal orientation, self-efficacy, and transformative learning is reviewed.

Self-efficacy

Self-efficacy is the belief in oneself to accomplish something. Individuals with high self-efficacy are more likely to undertake a challenging event. They attribute their successes and failures to themselves. When they fail, they are likely to blame the failure on their own lack of effort and be motivated to try harder to achieve the goal they had set. Those with a low self-efficacy are likely to find outside reasons for their failure and subsequently either lower or abandon the goal they had set (Bandura, 1997).

Bandura (1977) first introduced the concept in terms of task specific self-efficacy; that is, the belief someone has in themselves that they will be able to accomplish a specific task. Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982) expanded this to a concept of general self-efficacy. While Bandura (1977) focused on the

belief in being able to accomplish a specific task, Sherer et al.'s (1982) study examined how individuals approach life in general.

There is evidence that task specific successes or failures affect general self-efficacy scores. This effect is directly related to past experience and if the individual attributes the success or failure to himself or herself. Failure affects individuals with high general self-efficacy minimally. When they are not successful at a task, they attribute the failure to their own lack of effort or training, thereby building the motivation to try harder in subsequent attempts. Conversely, individuals that already have a low general self-efficacy are likely to attribute the failure to outside causes and give up, thereby lowering their general self-efficacy (Bandura, 1997).

Bandura (1977) wrote that people "process, weigh and integrate diverse sources of information concerning their capability, and they regulate their choice behavior and effort expenditures accordingly" (p. 212). Bandura (1977) noted that this decision making involves two related experiences. One was outcome expectancy—the belief that a behavior will result in an outcome. The other was self-efficacy expectancy; that is, how capable an individual feels. Bandura (1977) noted that, of the two, self-efficacy expectancy was more powerful.

*Self-efficacy Dimension*

Bandura (1977) identified three dimensions of task specific self-efficacy: level, strength, and generality. Level indicates applying task specific self-efficacy to a simple task or to ones that are more complex. Strength indicates the endurance that an individual has for bypassing obstacles. Generality is when individuals see themselves capable across a wide range of situations. Bandura, Adams, Hardy, and Howells (1980) conducted

experiments involving individuals with various phobias to prove the generality of

increased self-efficacy through modeling.

*General Self-efficacy*

General self-efficacy is task specific self-efficacy generalized to other situations.

Sherer et al. (1982) identified general self-efficacy as a general set of expectations that an

individual has that influences their expectations in new situations. Sherer et al.'s (1982)

General Self-Efficacy scale used items that were general in nature. Sherer and Adams'

(1983) work included additional studies to validate the scale. In doing so, they found the

General Self-Efficacy scale was more useful than the Social Self-Efficacy scale. Their

General Self-Efficacy scale measured the individual's capacity to plan, organize, and

complete tasks. The Social Self-Efficacy scale related to the individual's capacity and

ability to establish and maintain social relationships and function in social situations.

Shelton (1990) developed a more extensive schedule of questions measuring self-efficacy

in specific areas, going on the premise that general self-efficacy was the composite of

these domain specific items. The items spanned a broad range of life experiences.

Tipton and Worthington (1984) developed and verified a general self-efficacy

instrument that was based on faith in self. Rimm and Jerusalem's (1999) definition of

general self-efficacy was "a sense of personal control over one's environment; reflects

the belief of being able to master challenging demands by means of adaptive action and

thus empowers the individual to conduct a more active and self-determined life course"

(p. 330). Woodruff and Cashman (1993) reexamined the Self-efficacy scale developed by

Sherer et al. (1982) and determined that the scale was valuable but could use further

refinement. One suggestion was to add items that "reflect the social efficacy concept of

magnitude" (p. 430). In contrast, in evaluating Shelton's (1990) scale, they noted, "Her account did not appear to appreciate fully Bandura's (1977) comments on generality of task efficacy across domains" (p. 430).

<div align="center"><em>Self-efficacy Influences</em></div>

Bandura (1977, 1982, 1996) defined four sources that influence self-efficacy. They were performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Personal accomplishments are mastery experiences; by virtue of mastering a task, a person's self-efficacy increases. Vicarious experiences are based on social modeling; by seeing others do tasks, the individual develops the belief that he/she can also accomplish the task. Verbal persuasion is based on social persuasion; these beliefs develop through someone suggesting the individual is capable of accomplishing a task. For verbal persuasion to be effective, the individual must consider the source of the persuasion an expert. Unfortunately, with verbal persuasion, failure can completely destroy the individual's self-efficacy towards the task. Physiological states are physical and emotional states. Here, typically, individuals perform better when they are in a better state of mind (i.e., not tense).

> Bandura (1997) further explained:
>
> People with high self-efficacy are more likely to have high aspirations, take long views, think soundly, set themselves difficult challenges, and commit themselves firmly to meeting those challenges. They guide their actions by visualizing successful outcomes instead of dwelling on personal deficiencies or ways in which things might go wrong. . . .

People with a low sense of efficacy avoid difficult tasks. They have low

aspirations and weak commitment to their goals. They turn inward on their self-

doubts instead of thinking about how to perform successfully. When faced with

difficult tasks, they dwell on obstacles, the consequences of failure, and their

personal deficiencies. Failure makes them lose faith in themselves because they

blame their own inadequacies. They slacken or give up in the face of difficulty,

recover slowly from setbacks, and easily fall victim to stress and depression. (p.

4)

There was evidence that task specific successes or failures affect general self-

efficacy scores. This effect was directly related to past experience and whether or not the

individual attributed the success or failure to him or herself. In failure situations,

individuals with high self-efficacy determined that if they had only expended more effort

they would have been successful. Consequently, their self-efficacy stayed intact.

Conversely, those with low self-efficacy found outside causes as to why they could not

be successful. This defeatist attitude subsequently caused a lowering of the individual's

self-efficacy (Bandura, 1977).

Through these judgments made about their performance, an individual's self-

efficacy will raise or lower accordingly. Bandura (1977) advocated the use of modeling

to accomplish a given task. Modeling can be accomplished by observing others (either

live or via media), by observing self (via media), and/or by other self-education means.

Bandura (1977) thought that modeling gave the individual a goal to emulate.

*Social Learning Theory*

Self-efficacy is an element of Bandura's (1977) social learning theory. Social learning theory focuses on the learning that takes place in a social context; that is, that people learn from one and other. This learning can be via observation, imitation, or modeling. This learning does not require a change in behavior. This contradicts the view of behaviorists in that they feel for learning to have taken place a permanent change in behavior is needed. Social learning theorists believe that, since learning can occur via observation alone, their learning might not be shown in the individual's performance. Cognition plays a role in learning, specifically awareness and expectations of future reinforcements may guide the behavior that an individual exhibits.

Bandura (1977) identifies four conditions that are necessary for successful modeling.: 1) Attention – the individual must pay attention to the model; 2) Retention – the individual must be able to remember what has been modeled; 3) Motor reproduction – the individual must be able to replicate the behavior that has been modeled; and 4) Motivation – the individual must want to demonstrate the modeled behavior. Individuals are more likely to engage in behaviors when they believe they will be successful in executing the behaviors. This belief that they will be successful means that they have a high self-efficacy.

*Self-efficacy and Achievement*

McClelland (1998), in *Human Motivation*, identified three types of motivational needs. These were: (a) achievement motivation, (b) authority/power motivation, and (c) affiliation motivation. McClelland (1953), in his studies of motivation, determined that achievement motivation was the primary determinant of achievement. This need was said

to be an indicator of aspiration to a standard of excellence in achievement situations. It was a psychological factor that dictated the need to excel in situations where standards of excellence were predetermined. It was also a desire to do well because of the personal satisfaction, and not the social recognition, derived from it.

McClelland (1961) described achievement motivated individuals as having the following characteristics:

1. They find the achievement more important than any financial or material reward.

2. They find that the achievement gives a greater satisfaction than receiving praise or recognition.

3. They view financial reward as a measure of their success, not an end in itself.

4. They do not consider security or status a prime motivator.

5. They require feedback—as a measure of success, not as a means of recognition.

6. They are constantly looking for how things can be done better.

7. They will seek jobs that allow them to set their own goals.

The driver for individuals that possess the power/authority motivation is the need to be influential. They need to be effective, making an impact in their efforts. They have a strong need to lead and for their ideas to prevail. They are driven by a need to improve their status and prestige.

Affiliation motivated individuals are driven by the need for friendly relationships. They are motivated through interactions with other people. They are motivated by the need to be liked and held in high regard. These individuals make great team players.

Most people possess a combination of these characteristics. Some individuals exhibit a strong inclination towards just one of these motivational needs. An individual's motivational mix affects their behavior and work/management style. For instance, an individual with a strong affiliation style would not make a good manager. This is because the manager would be more concerned with being liked, than with being successful. A strong authority motivation produces a strong work ethic and commitment to the organization. Although an authority motivation can lead individuals to leadership roles, they are not always successful in these roles, because they lack the skills for flexibility and people-centeredness. Although they may be too demanding of their employees, McClelland believed that strong achievement motivated individuals make the best leaders. Self-efficacy has been linked to all three of these motivations. Even though the drive for each of these motivations is different, each leads the individual towards challenging tasks.

*Self-efficacy Studies*

Academic studies (Betz & Hackett, 1981; DiClemente, Prochaska, & Gibertini, 1985; Lane & Lane, 2001; Schunk, 1983; Schunk, 1991; Sherer et al., 1982; Vrugt, Oort, & Zeeberg, 2002; Weinberg, Yukelson, & Jackson, 1980; Wood & Locke, 1987; Wurtele, 1986) have addressed the various ways that an individual's self-efficacy increases when they have successfully met a challenging event.

Investigations of individual self-efficacy have been done under various conditions, such as social anxiety (Blazer, 2002; Lane, Jones, & Stevens, 2002a; Leary & Atherton, 1986; Maddux, Norton, & Leary, 1986; Matsushima & Shiomi, 2003; Rosenbaum & Hadari, 1985; Schlenker & Leary, 1982); career choice (Betz & Hackett,

1981; Giles & Rea, 1999; Sullivan & Mahalik, 2000; Taylor & Betz, 1983; Wheeler, 1983); addictive behavior (Cabana, Rand, Slish, Nan, Davis, & Clark, 2004; DiClemente, 1986; Dijkstra & De Vries, 2000; Etter, Bergman, Humair, & Perneger, 2000; Hasking & Oei, 2002); academic performance (Lane & Lane, 2001; Schunk, 1983; Schunk, 1991; Vrugt et al., 2002; Wood & Locke, 1987); and athletic performance (Barling & Abel, 1983; Ostir, Cohen-Mansfield, Leveille, Volpato, & Guralnik, 2003; Wurtele, 1986). This research has shown that individuals with high self-efficacy are less prone to depression, find it easier to make career choices, have an easier time overcoming addictions, and perform better both academically and athletically.

Schlenker and Leary (1982) identified social anxiety as a situation where an individual wants to make a favorable impression, but they fear there is a low probability of doing so. Maddux, Norton, and Leary (1986) had undergraduate students imagine themselves in various social situations. Their conclusions indicated an inverse relationship between self-efficacy and social anxiety. Stanley and Maddux (1986) examined the relation between self-efficacy and depression, while Rosenbaum and Hadari (1985) looked at the relation between depression and paranoia. An interesting distinction discovered between the paranoid participants and the depressed participants was how they felt the outcomes were controlled. Paranoid participants felt others controlled the outcomes, whereas the depressed participants felt the outcomes were controlled by chance. Blazer (2002) investigated the correlation between self-efficacy and late life depression. Lane, Jones, and Stevens (2002a) researched the impact of failure on self-efficacy. This research discovered an inverse relationship between self-efficacy and increased social anxiety.

Betz and Hackett (1981) examined self-efficacy and gender differences, relative to traditional male and female roles. They discovered "significant and consistence sex differences in self-efficacy with regard to traditional and nontraditional (for females) occupations" (p. 399). Women had significantly higher self-efficacy for traditional roles and significantly lower self-efficacy for nontraditional roles. Men, on the other hand, showed equal levels of self-efficacy with regard to traditional and nontraditional roles. Giles and Rea (1999) examined gender differences in career choices based on traditional gender roles. They found men with low self-esteem were unlikely to accept non-traditional male roles, while men with high self-efficacy were willing to accept traditionally feminine roles. Women, on the other hand, showed no statistically significant difference. Wheeler (1983) determined that perceived self-efficacy was a high predictor of occupation choice. Taylor and Betz (1983) concluded that a low level of career decision making self-efficacy led to indecisiveness in career choice.

DiClemente (1986) investigated individuals who were attempting to quit smoking. He discovered that the longer someone remained smoke free, the higher his or her self-efficacy became. He established that self-efficacy was not only a good predictor of the likelihood of being able to quit but also the likelihood of relapse. Dijkstra and De Vries (2000) also studied smoking cessation. They determined that individuals with high self-efficacy were more likely to quit and less likely to relapse. Hasking and Oei (2002) studied adolescents' ability to refuse alcohol. Their findings indicated that those with high self-efficacy had less trouble refusing alcohol. Cabana et al. (2004), who probed the ability of obstetricians to discuss substance abuse with their patients, determined that

those with a higher level of self-efficacy were able to brooch and discuss the issue with their patients effectively.

*Motor Performance*

One of the earliest studies of self-efficacy in relation to motor performance was the work done by Feltz, Landers, and Raeder (1979). The experiment focused on teaching women to do a back dive using live modeling or a video presentation. Half of the women attempted to learn to do a back dive by watching a live model perform it; the other half watched a video. Unfortunately, the difficulty of the task made the results inconclusive. The authors realized that other factors, beyond merely learning the mechanics, contributed to an individual's ability to perform a back dive.

Weinberg, Gould, and Jackson (1979) conducted an experiment where participants competed in a leg extension exercise. The participants were given information to cause them to believe that they had either a high probability of beating their opponent or a high probability of failure. The competitor set the efficacy expectation by either indicating they had recently been injured or by indicating how fit they were. Weinberger et al. (1979) concluded that those in the higher self-efficacy group tried harder. As a number of issues were discovered with this experiment, it was repeated a year later correcting for these deficiencies, the main issue being that the test subjects were able to observe the control subject. When Weinberg, Yukelson, and Jackson (1980) repeated the experiment, they had the competitors sit back-to-back, preventing them from knowing how the opponent was doing. They also had the test subjects state their expected achievement. They discovered a significant difference between the male and female

participants. They speculated that this was due to the fact that males are typically expected to be more competitive than women.

Lee (1982) conducted an experiment with adolescent competitive gymnasts, asking the girls and coaches to predict how the girls would score during the competition. The girls with higher self-efficacy tended to more accurately predict their scores. This raised the question: Were their predictions better because they had a higher self-efficacy; or did they simply have a better understanding of their own ability?

*Changing Self-efficacy*

Gist and Mitchell (1992) identified three strategies for increasing self-efficacy. The first strategy they identified was to provide information that gives the individual a better understanding of the task. This information includes such factors as complexity and the environment of the task. The second strategy was to provide training. This training is to increase the individual's current abilities. The third strategy was to provide an understanding that will allow the individual to develop strategies to be successful.

Gist and Mitchell (1992) discussed four sources of self-efficacy, two internal and two external. The four categories were divided into two dimensions: locus of the determinant (external or internal) and variability of determinant (high or low). For the external sources, low category factors pertained to task (complexity, performance requirements, and task attributes). For the external sources, high category factors were cues produced by the environment (distractions, risk, and physical setting). The internal, high variability category covered performance strategies and motivation (goals, priorities, interests, and mood). Finally, the internal, low category items were stable factors (abilities, physical condition, and personality traits).

Goal Orientation

Goal orientation describes how individuals interact with and react to their environment. As initially conceived by Dweck (1986), goal orientation was a personality dimension. In her original work, Dweck (1986) conceptualized these orientations as opposite ends of a continuum. At one end was the learning (or mastery) orientation; at the other end was the performance (or proving) orientation. Learning oriented individuals are more likely to attempt challenging situations, because they believe that they control their own abilities. They do not depend on social comparison to gauge their success; instead they rely on their own past experiences. For them, failures are simply thought of as learning opportunities.

On the other hand, performance oriented individuals look to gain positive evaluations or at least avoid negative evaluations. As a result, they usually depend on social measures to judge their performance. They react negatively to failure, because they see this as confirmation of their lack of ability (Dweck & Leggett, 1988). These individuals are less likely to take chances in situations where they perceive their ability is low. Their perceived ability moderates the relationship between their performance goal orientation and their performance. If they perceive their ability as high, these individuals also engage in a learning oriented approach (Elliott & Dweck, 1988), which is seen through their persistence (Dweck & Leggett, 1988).

More recent studies have indicated that these are, in fact, two distinct dimensions (Ames & Archer, 1988; Button et al., 1996; Colquitt & Simmering, 1998; Heyman, Heyman, & Dweck, 1992; Phillips & Gully, 1997). That is, an individual can be high or low on both orientations or may exhibit some combination of the two. Goal orientations

have both dispositional and situational aspects. An individual can have a learning

orientation but, in a given situation, react in a performance oriented manner. Individuals

with a performance orientation, given the right circumstances, will behave in a learning

oriented manner. VandeWalle (1997) further refined the goal orientation construct by

identifying a third dimension, the avoiding orientation. Where the performing orientation

seeks approval for successes, the avoiding orientation seeks to avoid disapproval because

of failure.

Phillips and Gully (1997) established that goal orientation was related to self-

efficacy. They also noted that self-efficacy was related to self-set goals, which in turn

affected performance. They determined that individuals with a learning orientation are

more likely to display enhanced self-efficacy, while individuals with a performance

orientation, generally speaking, are less likely to exhibit strong self-efficacy, leading

indirectly to performance differences.

<div align="center"><em>Goal Orientation and Performance</em></div>

Dweck's (1986) initial research investigated school age children. The first set of

tasks she gave them were age appropriate. After the successful completion of these tasks,

she gave them a second set of tasks that were beyond their ability. She observed in this

second set of tasks that about half the children exhibited maladaptive response patterns

and were frustrated. They exhibited a sense of helplessness, a loss of confidence, and

were unable to concentrate. The other half of the children showed an adaptive nature and

seemed to enjoy the challenge of the new task.

Dweck (1986) determined that they were approaching the problems with different

goals in mind. The first set of children approached the task looking for approval from

successfully completing it. Dweck (1986) designated this orientation performing (or proving) goal orientation. These children viewed their ability as stable. She included in this orientation the need to avoid negative judgment. VandeWalle (1997) separated the avoidance orientation from the performing orientation. He labeled this orientation avoiding goal orientation.

The children that exhibited adaptive responses were focused primarily on developing new learning strategies. Dweck (1986) labeled this approach learning (or mastery) goal orientation. This orientation focused on developing new competencies. She determined that exerting effort is natural for those that come from a learning orientation, whereas those with a performing orientation see their abilities as fixed, so they are not likely to exert a similar effort. According to VandeWalle (2001), these individuals will be devastated by failure, as it will confirm their inability.

Because learning oriented individuals see their abilities as malleable, they are more likely to attempt difficult tasks. These specific, difficult goals have an energizing effect. The effect on performance has been seen in the goal setting literature (Latham & Kinne, 1974; Latham, 2001; Latham & Saari, 1979; Latham & Steele, 1983; Wood, Locke, & Mento, 1987). VandeWalle, Cron, and Slocum (1999) determined that goal setting, expended effort, and planning arbitrate the relationship between goal orientation and performance. They concluded that individuals with a learning orientation are more likely to set goals and consequently expend greater effort, resulting in higher performance. Brett and VandeWalle (1999) identified that goals set by learning oriented individuals are significantly different than those set by performance oriented individuals

(e.g., improve skills versus avoid a negative evaluation) and this, in turn, mediates the relationship between goal orientation and performance.

Phillip and Gully (1997), in a longitudinal field study, found a positive correlation between learning (mastery) orientation and exam scores and a non-significant difference between performance orientation and exam scores. Additional studies were done with large samples of college students (Button et al., 1996). These studies found the same correlation: learning (mastery) orientation was positively correlated with grade point average, while performance orientation and grade point average were non-significantly correlated. These studies indicated that a mastery orientation, more than a performance orientation, was likely to lead to a positive outcome (VandeWalle et al., 1999).

The primary characteristic of a mastery goal orientation is an individual's desire to increase their competencies. This orientation leads individuals towards more effective learning strategies, a preference for challenging tasks, and a belief that success follows effort. Goal orientation distinguishes individuals who see their abilities as malleable (learning oriented) or fixed (performance oriented).

Duda and Nicholls (1992) developed the Task and Ego Orientation in Sport Questionnaire (TEOSQ). The two dimensions they identified were task and ego, where task is similar to Dweck's (1986) learning orientation and ego is similar to Dweck's (1986) performance orientation. While Dweck's (1986) instrument focused on academic or learning situations, Duda and Nicholls' instrument was designed specifically for sports.

*Goal Orientation Studies*

Similar studies have been done in educational psychology. Ames and Archer (1988) determined that a mastery orientation predisposes individuals to use self-regulation techniques in order to reach their goals. Conversely, those with a performance orientation do not. Button et al. (1996) identified learning and performance as two distinct dimensions. They determined that learning and performance were not two ends of a single spectrum but that individuals could show a propensity for both (or neither) goal orientations. Additionally, they discovered a situational aspect of goal orientation, namely, that the strength of an individual's performance or learning orientation can vary with the situation. Individuals that typically show a learning orientation can switch to a performance orientation depending on the situation and, conversely, those with a performance orientation can switch to a learning orientation.

A number of studies have observed organizations and have looked specifically at the relationship between goal orientation and motivation and between goal orientation and performance. Farr et al. (1993) researched goal orientations in organizations. They concluded that individuals with a performance orientation were less likely to take on a challenging task than those with a learning orientation. Those that were low on both scales demonstrated an overall apathy. Fletcher (2001) explored the implications of goal orientation on performance appraisals. This study was a literature review and raised a multitude of questions. Gerhardt (2003) investigated how training programs can be used to increase goal orientation and subsequently improve performance. Potosky and Ramakrishna (2002) researched information technology professionals. They found that learning positively correlates to self-efficacy and performance orientation relates

negatively. This difference in self-efficacy was then correlated with performance, as those with a high self-efficacy performed better than those with a low self-efficacy.

Many studies have been done relating goal orientation to exercise and sport performance. Boyd et al. (2002) investigated the motivations for exercise and found a positive correlation between task orientation and motivation. In addition, they discovered no significant correlation between ego orientation and motivation. Kilpatrick et al. (2003) studied motivation for exercise and goal orientation. They concluded that performance oriented individuals were motivated by competition and task oriented individuals were motivated by enjoyment. Ntoumanis and Biddle (1998) researched college athletes. They established that subjects were motivationally adaptive when high ego orientation existed in combination with high task orientation. In their study, only those with high ego and low task were not adaptive. Shakarian (1995) presented tools for developing task orientation for physical education instruction in schools. Stuntz and Weiss (2003) probed unsportsmanlike conduct in middle school students. They concluded that social orientation played more of a role than task or ego orientation. Tod and Hodge (2001) studied rugby players. They determined that those dominated by an ego orientation were less likely to use moral reasoning than those that were task dominated. Hodge and Petlichkoff (2000) also studied rugby players. They used three groupings for each dimension (low, medium, and high). They found no players in the two extreme categories, low/low or high/high. They also noted that ego significantly correlated to perceived ability. Those with a high ego orientation, regardless of learning orientation, perceived their ability to be high, whereas those with a low ego orientation did not.

Other studies have specifically looked at the correlation between goal orientation and motivation. Weigand et al. (2001) investigated the influence of significant others on goal orientation and subsequent motivation. They found a positive correlation between the influence of significant others and task orientation. Eppler et al. (2000) researched older students as compared with traditional students. They determined that older students were more learning oriented than younger students. They also concluded that students with a performance orientation were more inclined to use a negative explanatory style when explaining low grades.

Numerous studies have been done on goal orientation. For instance, Eppler and Harju (1997) researched nontraditional and traditional collegiate students. They noted that those with a learning orientation had higher grade point averages. They also discovered that nontraditional students rated higher on learning orientation. Seegers et al. (2002) concluded that, even when students were in a learning situation, their self-appraisal was dependent on their goal orientation. Performance oriented students still rated their ability negatively, if their performance was poor.

<div align="center">Transformative Learning</div>

Mezirow's (1978) transformative learning has been considered one of the most comprehensive learning theories (Marsick & Finger, 1994), since it integrates the concepts of such theorists as Dewey (1959), Freire (1970), and Habermas (1985). What distinguishes transformative learning from other types of learning is the amount of change it produces in an individual. Watzlawick, Weakland, and Fisch (1988) described the kind of change involved in transformative learning as second order learning; that is, learning which alters the fundamentals of a system. They distinguished this from first

order learning, which simply adds new knowledge to the system and where no fundamental change takes place.

This is similar to what Argyris and Schon (1974) referred to as single and double loop learning. In single loop learning, new knowledge is just added to the system. In double loop learning, the individual reflects on what they have learned, which can cause changes throughout the system.

Mezirow (1995) described two kinds of learning: additive and transformative learning. Within the additive, he differentiated two types of learning, one that integrates ideas into an individual's current beliefs and another that adds new beliefs. Within the transformative, he also described two types of learning. In the first, the individual's frame of reference is transformed through the learning. In the second, critical reflection takes place and this ultimately transforms the individual's belief system. Both transformative learning and double loop learning change the way individuals view their basic assumptions.

Mezirow (1995) identified three ways that adults attempt to make meaning out of their experiences. The first of these processes is to use words to make meaning; the second is to use non-verbal methods (such as intuition) to make meaning; the third—and the only one that truly makes meaning—is critical reflection. When critical reflection leads to a change in meaning schemes, transformative learning has occurred - these shifts in meaning cause individuals to question their basic assumptions. Mezirow (1995) argued that these transformations come in two varieties: those that change a point of view ("meaning schemes") and those that change habits of mind ("meaning perspective").

The term meaning perspective refers to the basic assumptions that change. Mezirow (1995) argued that an individual must reflect critically on an experience for this transformation to take place. Meaning perspectives are frames of reference. They are the lenses we use to understand the events in our lives. Our expectations and assumptions are set based on these frames of reference. Individuals tend to discard anything that does not fit within these frames of reference (Mezirow, 1997). Meaning schemes make up meaning perspectives. Meaning schemes are "made up of specific knowledge, beliefs, value judgments, and feelings that constitute interpretations of experience" (Mezirow, 1991).

Mezirow (1995) identified three types of meaning perspectives: epistemic, sociolinguistic, and psychological. Epistemic refers to the use of knowledge; it can be distorted by learning or cognitive style. Sociolinguistic refers to the effect of social coding and language on understanding; it can be distorted by cultural influences or embedded assumptions. Psychological refers to how individuals feel about themselves; it can be distorted by an individual's self-efficacy.

When a radically different perspective causes us to question the structures that make up our meaning perspective, a disorienting dilemma can occur. This disorienting dilemma was at the heart of Mezirow's (1995) perspective transformation theory. Perspective transformations typically happen as the result of a disorienting dilemma; however, they can also be the result of a series of transformed meaning schemes. Disorienting dilemmas, like the loss of a loved one or a natural disaster, are typically stressful.

Transformations can occur gradually over time (cumulative transformations) or as a disorienting dilemma (epochal transformations). For transformation to occur, an individual has to reflect on the experience. This reflection can be in relation to the content, the process, or the premise of the experience. Reflections in relation to content or process can lead to changes in belief (single-loop learning). However, premise reflections can cause a reframing of the problem, leading to changes in belief systems (double-loop learning).

<div align="center"><em>Steps in Perspective Transformation</em></div>

Perspective transformation is the process of becoming critically aware of how and why our assumptions have come to constrain the way we perceive, understand, and feel about our world; changing these structures of habitual expectation to make possible a more inclusive, discriminating, and integrating perspective; and, finally, making choices or otherwise acting upon this new understanding (Mezirow, 1991, p.167).

Mezirow (1978) was the first to introduce steps of perspective transformation (see Figure 2), which he did in his report on women re-entering school after a long hiatus. Typically, the process had been envisioned as a linear process. However, Mezirow (1995) found that the steps did not always happen in the same order, and, moreover, multiple steps could happen simultaneously. Taylor (1998) captured these steps as: "a disorienting dilemma, followed by self-examination of feelings, critical reflection, exploration and planning of new roles, negotiating relationships, building confidence, and developing a more inclusive and discriminating perspective" (p. 39).

The disorienting dilemma is the catalyst that initiates the process of transformative learning—typically viewed as an internal or external crisis. Clark (1991;

1993) concluded that, in addition to disorienting dilemmas, integrating circumstances can play a role in triggering a transformative learning experience. Clark described integrating circumstances as indefinite periods of time in a person's life when they look for something that is missing. This searching can be conscious or unconscious. Clark argued that when individuals find the missing piece, the transformative learning begins to take place.

| |
|---|
| 1. A disorienting dilemma. |
| 2. Self-examination with feelings of guilt or shame. |
| 3. A critical assessment of assumptions. |
| 4. Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change. |
| 5. Exploration of options for new roles, relationships, and actions. |
| 6. Planning of a course of action. |
| 7. Acquisition of knowledge and skills for implementing one's plans. |
| 8. Provisionally trying out new roles. |
| 9. Building of competence and self-confidence in new roles and relationships. |
| 10. A reintegration into one's life on the basis of conditions dictated by one's new perspective. |

Figure 2. *Ten steps of perspective transformation*

*Note.* From *In Defense of Lifeworld* (p. 50), by J. Mezirow, 1995, New York: SUNY Press. Copyright 1995 by State University of New York. Adapted with permission.

Segal (1999) reminded us that, just because someone has experienced a disorienting dilemma, this does not mean that it will lead to critical reflection. As a matter of fact, this can lead individuals to take defensive actions. In terms of Kuhn's (1962) paradigm theory, this can be likened to scientists who work within a particular paradigm in the day-to-day but are not consciously aware of the paradigm. When they hit a crisis with their paradigm, they stop focusing on the day-to-day activities and focus on the paradigm. If they are able to shift paradigms, they experience a transformative learning. If they do not experience this transformative learning, it leads to the defensive state that Segal (1999) described.

Scott (1991), in her study of leaders in community organizations, identified two types of equilibrium disruptions that can lead to a change in beliefs. One was an internal dilemma triggered by an external event. The other was internal disillusionment, which leads to the acceptance that the current way of approaching a problem is no longer adequate. These dilemma trigger events do not necessarily happen as a crisis but as something that only becomes apparent over time.

*Aspects of Transformative learning*

Mezirow's (1978) theory advocated the rational approach. Boyd's (1991) theory, on the other hand, relied on intuition and emotion. While Mezirow's (1978) theory focused on the self, Freire (1970) focused on society and Boyd (1991) on the unconscious. This may make the theories appear contradictory; in fact, the theories are very similar—the focus is the only item that varies.

*Society*

In an attempt to look at transformative learning through the lens of Habermas's (1985) critical learning theory, Mezirow's (1978) initial arguments left many unconvinced (Collard & Law, 1989). Social Action Theory referred to a dominated group using emancipatory knowledge to free themselves, while transformative learning was centered at the individual level. Mezirow (1989) responded to this criticism by saying that the social actions that took place were a result of the critical thinking of the individual. That is to say, when the perspective of the individual changes, they will question how these new assumptions fit into society.

*Individuation*

Mezirow's (1991) approach to transformative learning was very rational and was rooted in the cognitive aspects that are needed to produce change. On his view, individuals become aware of the disorienting dilemma, think about it, and change accordingly. Boyd (1988; 1991), on the other hand, saw that feelings and emotions played a large role in these learning experiences. In particular, these feelings and emotions brought attention to unconscious issues. Boyd's (1988; 1991) work on transformative learning was grounded in Jung's concept of individuation. Jung (1965) described individuation as the holistic process by which an individual becomes self-realized.

The basis of Boyd's (1991) model was one of a journey of individuation. "Individuation involves the discovery of new talents, a sense of empowerment and confidence, a deeper understanding of one's inner self and greater sense of self-responsibility" (Boyd, 1991). According to Taylor (1998), Boyd (1991) defined

transformation as a fundamental change in an individual's personality. Through the transformation, an individual resolves a personal dilemma, at the same time expanding his or her consciousness, leading to greater personality integration (Imel, 1998).

Discernment was central to Boyd's (1991) theory. Discernment goes beyond the rational, looking at the symbols and images that create meaning. Discernment is composed of receptivity, recognition, and grieving. Individuals must be receptive to discovering new meanings; they must recognize that they are authentic; and they must be willing to let go of old meanings (Imel, 1998; Taylor, 1998).

Dirkx (2000), building on the work of Boyd, wrote, "Many learning situations are capable of evoking potentially powerful emotions and images" (p. 4). He continued on to say that transformative learning was the "process through which we actively participate in the journey of individuation" (p. 4).

Kovan and Dirkx (2003), in their study of environmentalists, determined that individuation provided the theoretical framework necessary to relate these emotional aspects to transformative learning. Their work looked at transformative learning from an almost spiritual concept. In the instance of the environmentalists, this would be the deep spiritual calling to protect the environment.

Freire (1970) viewed people as subjects rather than objects. In his opinion, individuals must continually reflect in order to continually transform their world for the better. Today educators frequently transmit information to the student so they can simply regurgitate it. Freire (1970) thought this oppressed students. By being allowed to critically reflect, they would be able to take the act of learning to cognition. Furthermore, Freire (1970) supported the notion of praxis—moving back and forth between reflection

and action in a critical way. Finally, Freire (1970) thought that teacher and student should be on an equal footing and that this would lead to a mutual dialog.

*Critical Reflection*

Mezirow (1995) indicated that critical reflection was an integral part of transformative learning. It is through this reflection that we question our basic assumptions. In his review of the empirical studies to date, Taylor (1998) concluded that emotion played at least as significant a role as critical reflection. As he stated, "Transformative learning is more than rationally based, but is reliant on the affective dimension of knowing" (p. 34). It is these feelings and emotions that trigger the reflection. Neuman (1996) studied transformative learning and critical reflection among participants in the National Development Leadership Program. Through his studies, he established that there was interdependence between the two constructs. He argued that, in reality, it was an iterative process.

In additional studies, Taylor (2001) concluded that "instead of critically reflecting on their experience, they (individuals) seem to respond with unmediated perception, trusting their reaction of direct apprehension and sensory understanding, whereby the process of transformation takes place on an implicit level, outside the awareness of the individual" (p. 220–221). These individuals preferred an experiential approach to learning—responding with thoughtful action rather than critically questioning their experience. Taylor concluded that transformative learning was based on not only rational reflection, but also included non-conscious ways of changing meaning structures. This indicated that much more attention needed to be given to emotion and implicit memories

in the transformation process. For these individuals, the transformation happens on an implicit level.

*Transformative Learning versus Peak Experience*

The seminal works of Maslow and Rogers form the "third force" within psychology. Maslow (1987) identified a hierarchy of human needs. These were: physiological, safety, belonging and love, esteem, and self-actualization. To move up to the next level, it is necessary to fulfill each of the needs below it. The highest of these, self-actualization, he explained, is the "full use and exploitation of talents, capabilities, potentialities" (p. 150). It is being all that one can be. The characteristics of self-actualization are both physical and cognitive behavior. The self-actualizer tends to:

- possess a high sense of morality,

- tolerate ambiguity,

- accept self and others,

- behave spontaneously in ways that are in tune with their values (not necessarily tied to common beliefs of the culture),

- focus on problems outside themselves,

- maintain a few close friends,

- have a high level of creativity, and

- experience more peak experiences.

According to Maslow (1987), individuals transform through new insights brought about by peak experiences. These peak experiences lead to transient moments of self-actualization. They are personally significant events. Peak experiences are typically

marked with an emotional element, such as ecstasy, bliss, rapture, or great joy. Peak experience is the actual experience that leads to this transformation.

Flow is typically tied to peak experiences (Csikszentmihalyi, 1990). It is the absolute absorption in an activity. Flow encompasses built-in goals, feedback, rules, and challenges. It involves concentration to the point of losing oneself. Typically, individuals cannot experience it during times of leisure, unless they fill their leisure time with activities that provide for it. Norman (1996) noted that individuals are not good at concentrating on a single task. However, in training, the coach sets up the conditions to be practiced and provides appropriate feedback. This allows the participant to fully benefit from the experience. The participant comes to realize that to be good they must concentrate, frequently reaching the flow state. Norman (1996) went on to say that to learn and improve requires reflection upon the performance. This leads the participant to know what to keep and what to change.

Privette (1983) identified peak performance as performance that exceeds the average. She distinguished peak performance from peak experience, in that peak experience is a positive extreme of feeling and peak performance is a positive extreme of performance. She defined peak experience as intense joy, peak performance as superior functioning, and flow as intrinsically rewarding experience. Within these, she found the following shared elements: absorption, awareness of power, joy, integration and personal identity, and a sense of letting go. She reported that peak experience seems to be mystic in nature. Peak performance, she discovered, had clarity of focus. Flow has a sense of fun. Flow has a structure determined by other people and involves play. Ultimately, she

concluded that peak experience, peak performance, and flow portray the key dimensions of self-actualization.

Taylor (1998) explained that transformative learning is the process that leads to a perspective transformation. He argued that transformative learning is the process of making meaning out of one's experience. The key elements of a perspective transformation are: the event, initially Mezirow (1995) felt this had to be a disorienting dilemma; critical reflection; and a realignment of one's basic assumptions. Typically, the disorienting dilemma carries a negative connotation, as one of the steps Mezirow (1995) identified was a feeling of guilt or shame. However, as the works of Taylor (1998) and Boyd (1991) have shown, positive experiences can lead to these changes in perspective. The positive experience that leads to a perspective transformation may hold many of the same attributes as Maslow's (1987) peak experience. Each is an experience that leads to a critical reflection of one's assumption, ultimately changing those assumptions.

*Transformative Learning and Marathons*

Perhaps Sheehan (1978) best summed up the marathon experience when he said, "I was determined to find myself. And in the process, my body and the soul that went with it" (p. 62). There have been numerous stories (Bingham, 1999; Greene & Winfrey, 1996; Kislevitz, 1998; Reti & Sien, 2003) of the extraordinary transformation individuals feel as a result of completing their first marathon. In *First Marathons: Personal Encounters with the 26.2 Mile Monster*, Kislevitz recounted the stories of 37 first timers. The basic theme within each story is summarized on the book cover flap:

They tell you how it feels every step of the way: the decision to try, the training, the obstacles, the unparalleled experience of the race itself. And, more importantly, they tell you how the marathon can change your life forever... The marathon is larger than life, a challenge that transforms all who rise to it... (Inside front cover)

Gondola and Tuckman (1982) noted that the connection between positive moods and physical exercise has always been discussed by philosophers. More recently, however, it has become an increasingly popular field of investigation. Their work, as well as that of others (Gondola & Tuckman, 1983; Lane, Lane, & Firth, 2002b; Schomer & Dunne, 1994; Wilson, Morley, & Bird, 1980), has found a positive correlation between running and less tension, less depression, less fatigue, less confusion, more vigor, reduced anxiety, increased self-image and confidence, an enhanced feeling of well-being, and elevated mood states. Wilson et al. (1980) concluded that, not only did exercisers display these qualities more than non-exercisers, but marathoners displayed them more than non-marathoners.

Link between Goal Orientation and Self-efficacy

Goal orientation is a likely influence on self-efficacy because of the impact of how an individual perceives himself or herself. Goal orientation has encapsulated different ideas of success and failure and the reasons for engaging in learning (Dweck, 1986). From the learning (or mastery) orientation, the individual believes that their ability can be improved and that these improvements are a result of effort. These individuals focus on developing new skills. From the performance (or proving) orientation, individuals feel their abilities are fixed. They are likely to evaluate their ability negatively

if they are unsuccessful (Ames & Archer, 1988). These individuals believe that their ability is demonstrated by superior performance (Colquitt & Simmering, 1998; Dweck, 1986). Individuals with a mastery orientation are more likely to experience an increased self-efficacy through training than those with a high performance orientation.

A learning (mastery) orientation positively correlates with self-efficacy (Brown, 2001; Ford, Smith, Weissbein, Gully, & Salas, 1998; Phillips & Gully, 1997). Individuals with a high learning (mastery) orientation are likely to have higher self-efficacy. This is because they view all experiences as learning experiences, including failures.

## Summary

Mezirow (1990) defined a meaning perspective as one's basic assumptions about life. These basic assumptions include theories, propositions, beliefs, prototypes, goal orientations, and evaluations. Mezirow (1997) also referred to meaning perspectives as frames of reference. Frames of reference are constituted by two dimensions, habits of mind and point of view. Habits of mind are broad, abstract ways of thinking and feeling that are influenced by our assumptions. Point of view is the beliefs, values, and judgments that shape a particular interpretation. An individual's habits of mind are expressed in a particular point of view. A transformative learning experience occurs when these meaning perspectives change. This change happens when something significant takes place (a disorienting dilemma) that makes one question these basic beliefs. Upon critical reflection, one accepts that the old belief is no longer valid and moves to accepting the new one.

Boyd (1991) discovered that an individual did not necessarily have to experience a disorienting dilemma to experience transformative learning and that transformative

learning could be emergent. Taylor (1998) suggested that even critical reflection is not necessary for transformative learning to occur. Within this emergent concept, individuals think back over time and realize they are not the same person they were. At no point were their basic assumptions shaken to the point that they required critical reflection to determine what was true. Rather, it is only when reflecting back over some span of time that the individual realizes their basic assumptions have changed.

Bandura (1977) described self-efficacy as one's belief in how well they can do a specific task. Sherer (1982) expanded this to a general concept; that is, one's belief in how they approach tasks in general. If an individual goes into a new task with the basic assumption that they will be successful, this individual is considered to have a high self-efficacy. Conversely, if their basic assumption tells them they are likely to fail, they are said to have a low self-efficacy. When events occur that cause a shift in self-efficacy, these basic assumptions transform.

Mezirow (1990) identified goal orientation as an element of meaning perspectives. Goal orientation describes how individuals interact with and react to their environment. From the learning orientation, the individual is primarily concerned with mastering the skills necessary to accomplish the task. From the performance orientation, the individual focuses on winning, on beating the competition. Dweck's (1986) seminal work conceptualized these as opposite ends of a single dimension. The work of Button et al. (1996) revealed that these were actually two distinct dimensions. When an individual's goal orientation shifts, it will transform how they interact and react to their environment.

The literature has shown that individuals with a high self-efficacy are likely to undertake challenging events. However, no studies have been undertaken that address how the successful completion of a challenging task will affect individuals with lower self-efficacy. Additionally, the goal orientation literature has shown a positive correlation between learning orientation and self-efficacy. The current research has shown that individuals with a learning (or mastery) orientation will have a higher self-efficacy. The literature has not addressed the question of whether or not raising an individual's self-efficacy can influence their learning orientation. Finally, the link between transformative learning and running has been identified. However, the nature of this transformation has not been explored, specifically in its association with both self-efficacy and goal orientation.

The current study fills in these gaps by measuring the changes in self-efficacy of first-time marathoners across a broad spectrum of self-efficacy levels and by correlating these findings with shifts in performance orientation. Follow-up interviews were conducted with some of the participants to determine how they felt they had transformed as a result of the experience.

CHAPTER 3

METHODS

Overview of Methodology

As stated earlier, there have been a number of oversights in the current literature. The self-efficacy literature has indicated that an individual must have a high self-efficacy in order to take on a task the magnitude of a marathon. The goal orientation literature has indicated that learning orientation is a good predictor of self-efficacy. The transformative learning literature has not attempted to quantify the transformation. This study seeks to quantify the changes experienced in self-efficacy and goal orientation, as well as to understand the nature of this transformation for first-time marathoners. Creswell (2003) suggested a sequential explanatory strategy for this type of research study. This strategy contains two phases. The first phase seeks to confirm theory, and the second phase seeks to understand what was learned in the first phase. In this study, the first phase used a quantitative approach to measure changes in general self-efficacy and goal orientation (learning orientation and performance orientation). The second phase, employing qualitative follow-up questions, sought to provide perspectives as to why these changes did or did not occur.

The research questions were designed to measure changes in the individual, as well as to understand the nature of these changes. This leads to a mixed method study. Teddlie and Tashakkori (2003) defined a mixed method study as one that uses "both qualitative and quantitative data collection and analysis techniques in either parallel or sequential phases" (p. 11). Further, they indicated that

although mixed method studies use both qualitative and quantitative data collection and analysis, they are often marginally mixed in that they are frequently either qualitative or quantitative in the type of questions they ask and the type of inferences they make at the end of the study. (Teddlie & Tashakkori, 2003, p. 11)

This study takes advantage of the five purposes of a mixed method study:

1. Triangulation – looking for convergence of the results;

2. Complementary – looking for overlapping and different aspects of the study;

3. Initiation – looking for different perspectives;

4. Development – using a sequential approach so the results of the first part of the study inform the second; and

5. Expansion – adding breadth to the study. (Tashakkori & Teddlie, 1998)

According to Teddlie and Tashakkori (2003), mixed methods allow us to answer questions that cannot simply be answered by either a qualitative or a quantitative approach. A mixed method study allows both confirmatory and exploratory questions to be answered simultaneously. In order to capitalize on the mixed method approach, this study was divided into two phases. The first phase was quantitative: surveying individuals before and after their first marathon to determine changes in general self-efficacy and goal orientation. The data from this first phase was used to determine participants for the second phase. The second phase was qualitative: seeking to explore how the participants understood their transformation as a result of training for and completing their first marathons. Participants for this phase were grouped based on their goal orientation, as well as their primary reason for doing the marathon.

*Research Questions*

1. What change in self-efficacy do individuals realize by virtue of training for and completing a marathon as measured by Sherer's (1982) General Self-Efficacy (GSE) instrument?

2. What change in goal orientation do individuals realize by virtue of training for and completing a marathon as measured by Button, Mathieu, and Zajac's (1996) Goal Orientation instrument?

3. What is the relationship between the change in self-efficacy and the change in goal orientation?

4. What is the relationship between an individual's reason for taking on the challenge of the marathon and their goal orientation?

5. How do first-time marathoners think their perspective has transformed by virtue of training for and completing their first marathon?

*Hypotheses*

$H_1$: By training for and completing their first marathon, individuals will experience a significant increase in self-efficacy (as measured by Sherer's (1982) General Self-Efficacy instrument) between the time when they begin training for the marathon and 14–21 days after completing the marathon.

$H_{1a}$: Individuals with an initial high score on the self-efficacy scale and a high performance orientation will experience significantly less change in self-efficacy than those with either an initial low self-efficacy score or a low performance orientation.

$H_{1b}$: Individuals with a high initial learning orientation will experience a significantly greater increase in self-efficacy than those with a low initial learning orientation.

$H_2$: By training for and completing their first marathon, individuals will experience a significant increase in learning orientation as measured by Button et al.'s (1996) Goal Orientation instrument.

$H_{2a}$: Individuals with slower completion times will show significantly higher learning orientations than those with faster completion times.

$H_{2b}$: Individuals with faster completion times will show significantly higher performance orientations than those with lower completion times.

$H_{2c}$: Older individuals will show significantly higher learning orientations than younger individuals.

H3a: Those with a low desire for a specific completion time will show a significantly higher learning orientation than those with a high desire for a specific completion time.

H3b: Those with a high desire for a specific completion time will show a significantly higher performing orientation than those with a low desire for a specific completion time.

Research Procedures

*Sampling*

*Phase 1*

Phase 1 of the study was open to all first-time marathoners. No restrictions were placed on the participants in terms of anticipated time to complete or which marathon was to be completed. Phase 1 consisted of a pre- and a post-survey. Participants for phase 1 of the study were solicited via the Internet.

Two hundred forty six individuals responded to the call for volunteers and of these 193 completed the pre-survey. Marathon dates ranged from September 26, 2004 through October 31, 2005. Two weeks after participants completed their marathon the post-survey was emailed to them. One hundred and four participants passed their marathon date and of these 79 completed the follow-up survey. For participants who were unable to receive email attachments, paper copies were mailed to them. Of the 79 participants who completed the second instrument, six had not actually completed their marathon, leaving a total of 73 pairs of completed surveys.

*Phase 2*

Participants for phase 2 were selected from those who successfully completed all steps for phase 1. These individuals were selected from the four groupings of goal orientation. To determine these four groupings a tertiary split was performed on both the learning and performing orientation scores for the data collected from the 193-pre-survey surveys. By doing these tertiary splits, participants at all extremes within the collected data would be included in the survey phase of the study. Learning and performing orientation scores were classified as high, mid, and low, based on the tertiary values for

each. The four groupings of goal orientation where interviews were focused were: low learning and performance orientation, low learning and high performance orientation, high learning and low performance orientation, and high learning and performance orientation. For each of these groupings, a minimum of three interviews was conducted.

Additionally, participants selected one of four reasons as their primary reason for entering the marathon: challenge, charity, health, and other. For each of these options, except charity, a minimum of five interviews was conducted. There were only two participants who had indicated charity as their primary reason for doing the marathon and both of these individuals were interviewed.

*Data Collection*

Messages were sent to hundreds of running groups across the country, posted on numerous running boards, and sent to several well known marathon training experts (see Appendix A for a sample of the recruitment letter). The recruitment letter encouraged readers to forward the message to other potential participants. Participants were directed to a website (http://www.bke-associates.com) to signup for the study. Once at this website, they selected the "research" button to signup for the study. This signup included the initial demographic data collection.

After completing the signup process, an email message was automatically generated and forwarded to me. This message was automatically parsed, storing the demographic data in a spreadsheet and forwarding a copy of the survey to the participant. Two weeks after the participant's marathon date the follow-up email was sent to them. For participants who were unable to receive email a paper copy was mailed.

The second phase used the results of the first phase to select participants. As described above, participants were selected based on their goal orientation and their primary reason for doing the marathon. Upon receiving the follow-up survey, if the participant fit within the selection criteria for the follow-up interviews, they were sent a copy of the informed consent and an invitation to participate in the interviews. Interviews were conducted and signed informed consents collected at the convenience of the participant. All interviews were recorded and transcribed.

*Instrument and Interview Protocol Distribution*

The instruments were distributed in one of three ways. Most were distributed via email, asking the participant to fill them out and return them via email. Participants that were unable to receive electronic copies were mailed paper copies.

The demographic instrument was available on the web at http://www.bke-associates.com. The purpose of this site was two-fold: it allowed participants to signup for the study and to fill out the initial demographic data. In lieu of an informed consent, the site included an information sheet identifying the purpose and conditions of the study.

Participants were instructed to fill out the initial instrument within two weeks of signing up for a marathon. Upon receipt of the completed instrument, a unique identifier was assigned to the participant; this key was used to match pre- and post-surveys. The follow-up survey was sent to the participant two weeks after they completed their marathon. This delay was to insure that the participants would have come down from the initial euphoria, as well as from the post-marathon depression that is frequently associated with completing the event. The follow-up survey included questions in

addition to the goal orientation and self-efficacy instruments. Appendix C contains these questions.

Participants were contacted by phone for the interviews. This verbal communication allowed for a deeper probing of their responses. Semi-structured interviews were conducted with 21 participants. These participants were selected from each of four goal orientations: high learning/high performance, low learning/high performance, high learning/low performance, and low learning/low performing. Mutually agreeable times were scheduled for the interviews with each of the participants. Interviews lasted between 30 to 45 minutes.

*Instrumentation*

The demographic instrument (see Appendix B), Sherer's (1982) General Self-Efficacy instrument (see Appendix D), and Button et al.'s (1996) Goal Orientation instrument (see Appendix F) were combined into a single file for distribution.

*Sherer's General Self-Efficacy Instrument.* The Self-Efficacy Scale (Sherer et al., 1982) is a two-factor self-report instrument. The first factor has 17 items and operationalizes general self-efficacy. The second factor has six items and measures social self-efficacy. An additional seven items are included as filler items. Each item is rated on a 5-point Likert scale with polarities of 1 = Strongly Disagree to 5 = Strongly Agree. Some of the items are scored in reverse order. Reversing these items allows high scores to reflect a high self-efficacy. See Appendix E for a complete explanation of the process for calculating self-efficacy values.

Satisfactory levels of reliability have been reported by Sherer et al. (1982) with the general and social self-efficacy factors obtaining alpha coefficients of .81 and .71,

respectively. The authors reported that the construct validity of the general and social self-efficacy factors was moderate as a result of correlations with a range of other constructs such as locus of control, social desirability, ego strength, and interpersonal competency. Only the scores for general self-efficacy will be used for this study.

*Button et al. 's* (1996) *Goal Orientation.* The Goal Orientation instrument consists of 16 items. Eight of these are used to measure learning orientation, while the other eight measure performance orientation. Each item is rated on a 7-point Likert scale with polarities of 1 = Strongly Disagree to 7 = Strongly Agree. Learning orientation and performance orientation are calculated by averaging the eight values for each orientation. A high value on either orientation indicates a relatively strong orientation.

The Cronbach alpha as reported by Button and Mathieu (1996) for the eight-item learning goal orientation scale was .79. For the performance goal orientation scale they reported a Cronbach alpha of .73. From the four studies (N = 1441) they performed, they found that the two-factor model fit the data significantly better than the single factor model. From a theoretical perspective, individuals may believe in both implicit theories. They may believe it is possible to improve performance through learning and, at the same time, believe that success is dependent on their abilities.

This instrument was chosen over Dweck's (1986), which focused on academics, because it is more general in nature. Additionally, it was chosen over VandeWalle's, because the "avoiding dimension" is not relevant to this study. Participants were selected from individuals who had decided to signup for a marathon. Given the volunteer nature of the participation, it would be unlikely to detect an avoiding orientation among the

participants. Therefore, it was concluded that of the available instruments Button et al. (1996) was the most appropriate.

## Data Analysis

### *Phase 1*

Changes in general self-efficacy and goal orientation were calculated for all participants. SPSS was utilized to run the statistical analysis for phase 1. A level of significance of .05 was used to test each hypothesis.

T-tests were run against the data to determine

1. the significance in the change in general self-efficacy;

2. the significance in the change in learning orientation;

3. the significance in the change in performing orientation;

4. the significance of the general self-efficacy score of the participants in this study compared with other studies;

5. the significance of the learning orientation score of the participants in this study compared with other studies; and

6. the significance of the performing orientation score of the participants in this study compared with other studies.

Analysis of Variance was used to determine

1. the relationship between initial learning orientation and change in self-efficacy;

2. the relationship between initial general self-efficacy in combination with performing orientation and change in self-efficacy; and

3.  the relationship between goal orientation levels and change in self-efficacy.

Correlations were performed to determine:

1.  the relationship between age and learning orientation;

2.  the relationship between age and performing orientation;

3.  the relationship between finish time and learning orientation;

4.  the relationship between finish and performing orientation;

5.  the relationship between reason for doing the marathon and learning
    orientation; and

6.  the relationship between reason for doing the marathon and performing
    orientation.

*Phase 2*

Miles and Huberman (1994) noted that data collection and analysis is typically an

iterative process. This process includes data reduction, display, and conclusions drawn

from the data. In this study, the qualitative phase was done to explore the possible causes

of the findings from phase 1. Consequently, an iterative approach was not employed.

Responses were focused and relatively short, allowing for confirmation of the responses

during the interview. Additionally, codes were selected that were directly related to the

measures reported from phase 1. Other codes related specifically to transformative

learning. The codes included: "disciplined," "confident," and "less fear."

The data collected during this phase was bounded within the constructs of self-

efficacy, goal orientation, and transformative learning. The qualitative data for phase 2

was coded. Miles and Huberman (1994) defined codes as "tags or labels for assigning

units of meaning to the descriptive or inferential information compiled during the study"

(p. 56). These codes are assigned to "chunks" of the collected data. These chunks can be words, phrases, sentences, or even entire paragraphs. From this initial set of codes, patterns were identified. These codes were viewed through the conceptual framework of this study to explore the nature of the transformative learning experienced by first-time marathoners.

## Human Participants and Ethics Precautions

All ethical and human consideration guidelines described in *The George Washington University Non-Medical Institutional Review Board (IRB) Guidebook* (2004) were adhered to. The confidentiality of the participants was maintained. See Appendix H for a copy of the information sheet. Although participating in a marathon has some innate risk, this research did not introduce risks beyond those that are encountered in everyday life. All records were and are being maintained on password protected computers or in locked cabinets and only aggregated data is reported.

# CHAPTER 4

## RESULTS

### Phase 1

*Overview*

This study sought to understand the non-physical changes experienced by first-time marathoners; specifically, how their self-efficacy and goal orientation changed as the result of training for and completing a marathon. Through the use of a mixed-method study, empirical data were collected to calculate the changes in these two measures (e.g., self-efficacy and goal orientation). This quantitative phase was followed by a qualitative phase that sought to understand the learning transformations they experienced.

This chapter presents the results and statistical analysis of the data from the study. (See Appendix I for a complete listing of the raw data used in the analysis). It is organized into two primary sections (i.e., one for the results from phase 1 and the other for the results from phase 2) and a summary section. The section for phase 1 is divided into five subsections. The first subsection presents the demographic description of the study participants. The second subsection summarizes the response rate of the sample. The third subsection presents the statistical data associated with answering four of the research questions. The fourth subsection reviews the reliability of the test scores obtained from the instruments: Sherer's (1982) General Self-Efficacy and Button et al.'s (1996) Goal Orientation (learning and performing). The final subsection summarizes the key findings.

The section for phase 2 is divided into three subsections. The first subsection summarizes the findings from the short-answer questions. The second subsection

summarizes the findings from the interviews. The final subsection summarizes these

findings. The chapter concludes with a summary of the findings from both phases.

*Demographics*

The only demographic data that was collected from the participants in the study

was for age. Table 1, Table 2, and Table 3 show the frequency by age for the participants

involved at various stages of the study. Table 1 shows those who completed the initial

survey, Table 2 shows those whose marathon date passed (i.e., therefore they were

eligible to complete the second survey), and Table 3 shows those who actually completed

the second survey.

Table 1 *Age Demographics of Initial Respondents*

| | | Frequency | | Valid percentage | Cumulative percentage |
|---|---|---|---|---|---|
| Valid | Under 20 | 1 | .5 | .5 | .5 |
| | 20 - 29 | 59 | 30.7 | 30.7 | 31.3 |
| | 30 - 39 | 77 | 40.1 | 40.1 | 71.4 |
| | 40 - 49 | 46 | 24.0 | 24.0 | 95.3 |
| | 50 - 59 | 8 | 4.2 | 4.2 | 99.5 |
| | 60 - 69 | 1 | .5 | .5 | 100.0 |
| | Total | 192 | 100.0 | 100.0 | |

Table 2 *Age Demographics of Participants who Qualified for Follow-Up Survey*

|  |  | Frequency | Percentage | Valid percentage | Cumulative percentage |
|---|---|---|---|---|---|
| Valid | Under 21 | 1 | 1.0 | 1.0 | 1.0 |
|  | 20-29 | 31 | 30.7 | 30.7 | 31.7 |
|  | 30-39 | 42 | 41.6 | 41.6 | 73.3 |
|  | 40-49 | 21 | 20.8 | 20.8 | 94.1 |
|  | 50-59 | 5 | 5.0 | 5.0 | 99.0 |
|  | 60-69 | 1 | 1.0 | 1.0 | 100.0 |
|  | Total | 101 | 100.0 | 100.0 |  |

Table 3 *Age Demographics of Participants who Completed Follow-Up Survey*

|  |  | Frequency | Percentage | Valid percentage | Cumulative percentage |
|---|---|---|---|---|---|
| Valid | 20-29 | 22 | 30.1 | 30.1 | 30.1 |
|  | 30-39 | 34 | 46.6 | 46.6 | 76.7 |
|  | 40-49 | 13 | 17.8 | 17.8 | 94.5 |
|  | 50-59 | 4 | 5.5 | 5.5 | 100.0 |
|  | Total | 73 | 100.0 | 100.0 |  |

*Response Rate*

Two-hundred forty-six individuals responded to the call for volunteers; of these, 193 completed the pre-survey. Marathon dates ranged from September 26, 2004 through October 31, 2005. Two weeks after participants completed their marathon, the post survey was e-mailed to them. Of the 104 participants who had passed their marathon date, 79 completed the follow-up survey. Paper copies were mailed to those participants who were unable to receive e-mail attachments. Of the 79 participants who completed the second instrument, six had not actually completed their marathon, leaving a total of 73 pairs of completed surveys.

*Statistical Analysis*

This section presents the statistics used to answer four of the five research questions associated with Phase 1 of this study. These questions are:

1. What change in self-efficacy do individuals realize by virtue of training for and completing a marathon, as measured by Sherer's (1982) General Self-Efficacy (GSE) instrument?

2. What change in goal orientation do individuals realize by virtue of training for and completing a marathon, as measured by Button, Mathieu, and Zajac's (1996) Goal Orientation instrument?

3. What is the relationship between the change in self-efficacy and the change in goal orientation?

4. What is the relationship between an individual's reason for taking on the challenge of the marathon and that person's goal orientation?

Nine hypotheses were used to test these first four research questions. The nine hypotheses were:

$H_1$: By training for and completing their first marathon, individuals will experience a significant increase in self-efficacy, as measured by Sherer's (1982) General Self-Efficacy instrument, between the time when they begin training for the marathon and 14–21 days after completing the marathon.

$H_{1a}$: Individuals with an initial high score on the self-efficacy scale and a high performance orientation will experience significantly less change in self-efficacy than those with either an initial low self-efficacy score or a low performance orientation.

$H_{1b}$: Individuals with a high initial learning orientation will experience a significantly greater increase in self-efficacy than those with a low initial learning orientation.

$H_2$: By training for and completing their first marathon, individuals will experience a significant increase in learning orientation, as measured by Button et al.'s (1996) Goal Orientation instrument.

$H_{2a}$: Individuals with slower completion times will show significantly higher learning orientations than those with faster completion times.

$H_{2b}$: Individuals with faster completion times will show significantly higher performance orientations than those with lower completion times.

$H_{2c}$: Older individuals will show significantly higher learner orientations than younger individuals.

H3a: Those with a low desire for a specific completion time will show a

significantly higher learning orientation than those with a high desire for a

specific completion time.

H3b: Those with a high desire for a specific completion time will show a

significantly higher performing orientation than those with a low desire for a

specific completion time.

Specifically, research question 1 was address by hypothesis $H_1$; research question 2 by

hypothesis $H_2$; research question 3 by hypotheses $H_{1A}$, $H_{1B}$, $H_{2A}$, and $H_{2B}$; and research

question 4 was addressed by hypotheses $H_{3A}$ and $H_{3B}$.

*Tertiary Split*

The first statistical analysis performed was a tertiary split of the initial scores for

learning orientation, performing orientation, and goal orientation. The purpose of this

tertiary split was to classify the participants into groups for purposes of conducting the

interviews as well as evaluating the data. Using the tertiary method of dividing data into

groups allowed for analysis at both extremes of the data. That is, data for participants

who fell into the high or low category were analyzed for differences, rather than simply

looking at the correlations. Table 4 summarizes the descriptive statistics for General Self-

Efficacy (GSE), Learning Goal Orientation (LGO), and Performing Goal Orientation

(PGO). Table 5 summarizes the tertiary split for the same three measures. These statistics

are based on the responses to the initial survey. Results from the initial surveys were used

to determine participants' eligibility to participate in the follow-up interviews.

Table 4 *Descriptive Statistics*

| | N | Minimum | Maximum | Mean | Std. deviation |
|---|---|---|---|---|---|
| GSE | 192 | 37.00 | 85.00 | 66.3281 | 9.58793 |
| LGO | 192 | 1.75 | 7.00 | 5.9772 | .82130 |
| PGO | 192 | 2.50 | 7.00 | 5.2856 | .83959 |
| Valid N (listwise) | 192 | | | | |

Table 5 *Tertiary Statistics*

| | | GSE | LGO | PGO |
|---|---|---|---|---|
| N | Valid | 192 | 192 | 192 |
| | Missing | 0 | 0 | 0 |
| Percentiles | 33.33333333 | 64.0000 | 5.8800 | 5.0000 |
| | 66.66666667 | 71.0000 | 6.3800 | 5.7500 |

*Change in General Self-Efficacy (H1) and Goal Orientation (H2)*

$H_1$: By training for and completing their first marathon, individuals will experience a significant increase in self-efficacy, as measured by Sherer's (1982) General Self-efficacy instrument, between the time when they begin training for the marathon and 14–21 days after completing the marathon.

$H_2$: By training for and completing their first marathon, individuals will experience a significant increase in learning orientation as measured by Button et al.'s (1996) goal orientation instrument.

*Paired sample.* T-tests were performed to determine if the participants in the study experienced a significant change in general self-efficacy (GSE), learning goal orientation (LGO), or performing goal orientation (PGO). Table 6 shows the descriptive statistics for the participants who completed both surveys; Table 7 shows the t-test. These t-tests show there was no significant change in any of the three measures. Although it is insignificant, general self-efficacy and learning goal orientation each showed a slight increase. Also insignificant, but of interest, performing goal orientation showed a slight decrease.

Table 6 *Paired Samples Descriptives*

|  |  | Mean | N | Std. deviation | Std. error mean |
|---|---|---|---|---|---|
| Pair 1 | GSE1 | 66.4658 | 73 | 9.41937 | 1.10245 |
|  | GSE2 | 67.7671 | 73 | 8.04246 | .94130 |
| Pair 2 | LGO1 | 5.9084 | 73 | .72899 | .08532 |
|  | LGO2 | 5.9490 | 73 | .61061 | .07147 |
| Pair 3 | PGO1 | 5.3577 | 73 | .81464 | .09535 |
|  | PGO2 | 5.3121 | 73 | .83177 | .09735 |

Table 7 *Paired Sample t-Test*

| | | Paired differences | | | | | T | Df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. deviation | Std. error mean | 95% Confidence | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | GSE1 - GSE2 | -1.3014 | 7.45111 | .87209 | -3.0398 | .4371 | -1.492 | 72 | .140 |
| Pair 2 | LGO1 – LGO2 | -.0407 | .57105 | .06684 | -.1739 | .0926 | -.609 | 72 | .545 |
| Pair 3 | PGO1 - PGO2 | .0456 | .56022 | .06557 | -.0851 | .1763 | .696 | 72 | .489 |

*Other Studies.* To determine how this group compared with other groups that had been studied, additional t-tests were performed. For general self-efficacy, this population was compared with the initial population studied by Sherer (1982). His study consisted of 101 introductory psychology students. They show a mean score of 64.31 on the General Self-Efficacy scale. Table 8 summarizes the additional studies with which the participants in this study were compared. A weighted mean was calculated to be 72.72.

Table 8 *General Self-Efficacy Studies*

| Research | Participants | GSE mean | N |
|---|---|---|---|
| Weiner, Oei, & Creed (1999) | Employed | 82.11 | 102 |
| | Unemployed | 72.95 | 110 |
| Blake (2002) | With disabilities | 66.17 | 48 |
| Hamill (2003) | Resilient | 58.88 | 8 |
| | Competent | 67.00 | 7 |
| | Maladaptive | 65.73 | 11 |
| | Low competence | 53.82 | 17 |
| Whyte, Saks, & Hook (1997) | Low belief | 72.8 | 44 |
| | Control | 78.1 | 44 |
| | High belief | 83.8 | 44 |

From the initial work of Button et al. (1996), a score of 5.27 for performing goal orientation was found and a score of 5.43 for learning orientation was found. Of the 1,441 individuals involved in this study, over 1,200 were psychology students. Other studies investigated are summarized in Table 9. The weighted means that were calculated for the goal orientation studies were 4.86 for performing orientation and 5.00 for learning orientation.

Table 9 *Goal Orientation Studies*

| Study | Study focus | Performing | Learning | N |
|---|---|---|---|---|
| Fisher & Ford (1998) | Learning outcomes | 3.80 | 4.10 | 121.00 |
| Kohli, Shervani, & Challagalla (1998) | Sales people | 3.79 | 4.18 | 270.00 |
| Brown & Latham (2000) | Computer instruction | 3.69 | 3.26 | 78.00 |
| Swartz (2002) | Training transfers | 4.25 | 3.88 | 149.00 |

Using the above means, t-tests were run comparing the data for participants in this study with those in Sherer's (1982) original work, including a comparison of the weighted general self-efficacy means. For goal orientation, participants in this study were compared with those in Button et al.'s (1996) early work, and the weighted means for Goal Orientation (both for the learning and the performing scale) were compared. Table 10 shows that participants in this study had a significantly higher general self-efficacy score than did those in the original work. However, their scores are significantly lower than the weighted mean calculated for multiple studies (Table 11).

For goal orientation, participants' scores were significantly higher for learning orientation (Table 12), but not for performing orientation (Table 14). However, when compared with the means generated based on several studies, both t-tests indicate that

participants in this study had significantly higher scores (Table 13 and Table 15). The implications of this may be indicative of the results seen in the previous section. That is, because participants in this study started higher on each of the three scales, there was less room for them to show increases on any of the scales.

Table 10 *General Self-Efficacy Compared Sherer (1982) Study*

**One-Sample Test**

| | Test Value = 64.31 | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
|---|---|---|---|---|---|---|
| G1 | 2.917 | 191 | .004 | 2.0181 | .6533 | 3.3830 |

Table 11 *General Self-Efficacy Compared with Multiple Studies*

**One-Sample Test**

| | Test Value = 72.72 | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
|---|---|---|---|---|---|---|
| G1 | -9.237 | 191 | .000 | -6.3919 | -7.7567 | -5.0270 |

Table 12 *Learning Orientation Compared with Button et al.'s (1996) Early Study*

**One-Sample Test**

| | Test Value = 5.43 | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
|---|---|---|---|---|---|---|
| L1 | 9.232 | 191 | .000 | .5472 | .4303 | .6641 |

Table 13 *Learning Orientation Compared with Multiple Studies*

**One-Sample Test**

| | Test Value = 5.00 | | | | | |
| | | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| L1 | 16.486 | 191 | .000 | .9772 | .8603 | 1.0941 |

Table 14 *Performing Orientation Compared with Button et al.'s (1996) Early Study*

**One-Sample Test**

| | Test Value = 5.27 | | | | | |
| | | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| P1 | .258 | 191 | .797 | .0156 | -.1039 | .1351 |

Table 15 *Performing Orientation Compared with Multiple Studies*

**One-Sample Test**

| | Test Value = 4.86 | | | | | |
| | | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| P1 | 7.024 | 191 | .000 | .4256 | .3061 | .5451 |

*Summary.* This section presented the statistical analysis for the two top-level hypotheses. These hypotheses sought to determine if significant changes in pre- and post-survey scores existed for the first-time marathoners in terms of general self-efficacy and learning orientation. Based on these statistics, there was not a significant change. Specifically:

$H_1$: By training for and completing their first marathon, individuals will experience a significant increase in self-efficacy, as measured by Sherer's (1982) General Self-Efficacy instrument, between the time when they begin training for the marathon and 14–21 days after completing the marathon. The mean of pre-survey general self-efficacy scores is 66.47. The mean of the post-survey scores is 67.77. The t-test indicates this change is significant at .14, which is higher than the acceptable .05. Thus this research hypothesis is rejected.

$H_2$: By training for and completing their first marathon, individuals will experience a significant increase in learning orientation as measured by Button et al.'s (1996) goal orientation instrument. The mean of pre-survey learning orientation scores is 5.91. The mean of the post-survey scores is 5.95. The t-test indicates this change is significant at .55, which is higher than the acceptable .05. Thus, this research hypothesis is rejected.

*Measurement Relationships*

Correlation analysis is used to understand the relationship that exists between two elements. Analysis of variance analysis (ANOVA) is used to understand the differences in means for which categorized data is used by analyzing the differences posed in research questions three and four:

What is the relationship between the change in self-efficacy and the change in goal orientation? Five research hypotheses were tested for this question.

$H_{1a}$: Individuals with an initial high score on the self-efficacy scale and a high performance orientation will experience significantly less change in self-efficacy than those with either an initial low self-efficacy score or a low performance orientation.

$H_{1b}$: Individuals with a high initial learning orientation will experience a significantly greater increase in self-efficacy than those with a low initial learning orientation.

$H_{2a}$: Individuals with slower completion times will show significantly higher learning orientations than those with faster completion times.

$H_{2b}$: Individuals with faster completion times will show significantly higher performance orientations than those with lower completion times.

$H_{2c}$: Older Individuals will show significantly higher learner orientations than younger individuals.

What is the relationship between an individual's reason for taking on the challenge of the marathon and that person's goal orientation? Two research hypotheses were tested for this question.

H3a: Those with a low desire for a specific completion time will show a

significantly higher learning orientation than those with a high desire for a

specific completion time.

H3b: Those with a high desire for a specific completion time will show a

significantly higher performing orientation than those with a low desire for a

specific completion time.

A deeper understanding of the relationship is drawn. To categorize the three measures,

tertiary splits were used to define low, mid, and high ranges. The statistical analysis

associated with the correlations is presented first, followed by the ANOVA.

*Correlations.* Correlations are used to understand if a relationship exists between

two elements. The correlation coefficient (or Pearson $r$) is a numeric index that indicates

this relationship. It ranges from -1 to +1, indicating if there is an inverse or positive

relationship. A correlation analysis was run to determine if relationships existed between

age, days between when the person signed up for the study and completed the marathon,

the person's finish time in the marathon, how compelled the person felt to complete the

marathon in a set time, and initial scores (general self-efficacy, learning orientation, and

performing orientation) of the participants (Table 16). Of these, the only relationship that

shows a correlation (at the .01 level) is days until the marathon and learning orientation.

That is, the earlier someone had registered for the marathon, the higher the learning

orientation score was. No hypothesis had been proposed about this relationship; however,

it is interesting to note.

The relationships that had been hypothesized were between completion time and goal orientation, age and learning orientation, and importance of completion time and goal orientation. $H_{2a}$ hypothesized that slower runners would demonstrate higher learning orientations, and $H_{2b}$ hypothesized that faster runners would demonstrate higher performing orientation. In each of these cases, the correlation analysis indicates there is no significant relationship between speed and either of the goal orientation measures. $H_{2c}$ hypothesized that older individuals would show higher learning orientations. The relationship in this case is statistically insignificant and in the opposite direction. $H_{3a}$ hypothesized that those who attributed less importance to finishing within a specific timeframe would show higher learning orientation scores, and $H_{3b}$ hypothesized those who placed a greater emphasis on completing in a set timeframe would show higher performing orientation scores. In each of these cases, the correlation analysis indicates there is no significant relationship and thus both these hypotheses are rejected.

Table 16 *Correlations with Initial Scores*

**Correlations**

| | | AGE | DAYS | TIME | TIMEDRIV | G1 | L1 | P1 |
|---|---|---|---|---|---|---|---|---|
| AGE | Pearson Correlation | 1 | -.069 | .187 | .050 | .034 | -.016 | -.152 |
| | Sig. (2-tailed) | . | .564 | .113 | .677 | .775 | .892 | .199 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| DAYS | Pearson Correlation | -.069 | 1 | .028 | .090 | .191 | .314** | .187 |
| | Sig. (2-tailed) | .564 | . | .815 | .453 | .105 | .007 | .113 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| TIME | Pearson Correlation | .187 | .028 | 1 | -.218 | -.002 | .150 | .126 |
| | Sig. (2-tailed) | .113 | .815 | . | .066 | .985 | .205 | .288 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| TIMEDRIV | Pearson Correlation | .050 | .090 | -.218 | 1 | .026 | .018 | .020 |
| | Sig. (2-tailed) | .677 | .453 | .066 | . | .826 | .879 | .871 |
| | N | 72 | 72 | 72 | 72 | 72 | 72 | 72 |
| G1 | Pearson Correlation | .034 | .191 | -.002 | .026 | 1 | .604** | -.280* |
| | Sig. (2-tailed) | .775 | .105 | .985 | .826 | . | .000 | .017 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| L1 | Pearson Correlation | -.016 | .314** | .150 | .018 | .604** | 1 | -.060 |
| | Sig. (2-tailed) | .892 | .007 | .205 | .879 | .000 | . | .614 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| P1 | Pearson Correlation | -.152 | .187 | .126 | .020 | -.280* | -.060 | 1 |
| | Sig. (2-tailed) | .199 | .113 | .288 | .871 | .017 | .614 | . |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

To determine if relationships existed between (a) age, (b) days between when the person signed up for the study and completed the marathon, (c) the person's finish time in the marathon, (d) how compelled the person felt to complete the marathon in a set time, and (e) the change in scores (general self-efficacy, learning orientation, and performing orientation) of the participants, a correlation analysis was run (Table 17). None of these showed a significant correlation.

Table 17 *Correlation with Change in Scores*

**Correlations**

| | | AGE | DAYS | TIME | TIMEDRIV | GD | LD | PD |
|---|---|---|---|---|---|---|---|---|
| AGE | Pearson Correlation | 1 | -.069 | .187 | .050 | -.048 | .101 | -.054 |
| | Sig. (2-tailed) | . | .564 | .113 | .677 | .686 | .396 | .649 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| DAYS | Pearson Correlation | -.069 | 1 | .028 | .090 | -.114 | -.177 | -.147 |
| | Sig. (2-tailed) | .564 | . | .815 | .453 | .336 | .135 | .216 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| TIME | Pearson Correlation | .187 | .028 | 1 | -.218 | -.086 | -.128 | -.098 |
| | Sig. (2-tailed) | .113 | .815 | . | .066 | .472 | .280 | .411 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| TIMEDRIV | Pearson Correlation | .050 | .090 | -.218 | 1 | -.016 | .025 | .002 |
| | Sig. (2-tailed) | .677 | .453 | .066 | . | .892 | .836 | .987 |
| | N | 72 | 72 | 72 | 72 | 72 | 72 | 72 |
| GD | Pearson Correlation | -.048 | -.114 | -.086 | -.016 | 1 | .447** | -.221 |
| | Sig. (2-tailed) | .686 | .336 | .472 | .892 | . | .000 | .061 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| LD | Pearson Correlation | .101 | -.177 | -.128 | .025 | .447** | 1 | .045 |
| | Sig. (2-tailed) | .396 | .135 | .280 | .836 | .000 | . | .705 |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| PD | Pearson Correlation | -.054 | -.147 | -.098 | .002 | -.221 | .045 | 1 |
| | Sig. (2-tailed) | .649 | .216 | .411 | .987 | .061 | .705 | . |
| | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |

**. Correlation is significant at the 0.01 level (2-tailed).

To determine if relationships existed between initial scores and change in scores, a correlation analysis was performed (Table 18). Of the relationships that are depicted in this table, the only one of interest is the relationship between initial learning orientation and change in self-efficacy ($H_{1b}$). A relationship exists, but in the opposite direction than what was hypothesized; therefore, H1b is rejected.

It is interesting to note that both higher initial scores led to smaller changes for each of the measures that show a significant relationship. For high initial general self-efficacy scores, a statistically significant negative correlation is seen for both changes in general self-efficacy and learning orientation. For high initial learning orientation scores, a statistically significant negative correlation is observed with all three measures. For high initial performing orientation, the only statistically significant correlation is with change in performing orientation. Here, again, the correlation is negative.

Table 18 *Correlation of Initial Scores with Change in Scores*

**Correlations**

| | | G1 | L1 | P1 | GD | LD | PD |
|---|---|---|---|---|---|---|---|
| G1 | Pearson Correlation | 1 | .581** | -.286** | -.556** | -.389** | .100 |
| | Sig. (2-tailed) | . | .000 | .005 | .000 | .000 | .382 |
| | N | 97 | 97 | 97 | 78 | 78 | 78 |
| L1 | Pearson Correlation | .581** | 1 | .035 | -.248* | -.574** | -.244* |
| | Sig. (2-tailed) | .000 | . | .734 | .028 | .000 | .031 |
| | N | 97 | 97 | 97 | 78 | 78 | 78 |
| P1 | Pearson Correlation | -.286** | .035 | 1 | -.063 | .041 | -.323** |
| | Sig. (2-tailed) | .005 | .734 | . | .585 | .724 | .004 |
| | N | 97 | 97 | 97 | 78 | 78 | 78 |
| GD | Pearson Correlation | -.556** | -.248* | -.063 | 1 | .381** | -.213 |
| | Sig. (2-tailed) | .000 | .028 | .585 | . | .001 | .061 |
| | N | 78 | 78 | 78 | 78 | 78 | 78 |
| LD | Pearson Correlation | -.389** | -.574** | .041 | .381** | 1 | .023 |
| | Sig. (2-tailed) | .000 | .000 | .724 | .001 | . | .844 |
| | N | 78 | 78 | 78 | 78 | 78 | 78 |
| PD | Pearson Correlation | .100 | -.244* | -.323** | -.213 | .023 | 1 |
| | Sig. (2-tailed) | .382 | .031 | .004 | .061 | .844 | . |
| | N | 78 | 78 | 78 | 78 | 78 | 78 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

*ANOVA.* A one-way analysis of variance (ANOVA) is used when categorical

independent variable(s) (i.e., with two or more categories) and a normally distributed

interval dependent variable are to be compared. The ANOVA determines if the means

based on different intervals are statistically different. The first ANOVA analysis that was

run was based on the person's primary reason for doing the marathon. As can be seen

from the frequencies in Table 19, more than half of the participants in this study did the

marathon for the challenge of it. Although charities have been a major recruiter of first-

time marathoners, few of the participants in this study felt their primary reason for doing

the marathon was for the charity. The data for the ANOVA (Table 20) indicate that there

is no significant difference in self-efficacy based on the reason for doing the marathon.

Additionally, none of the categories showed a significant change in general self-efficacy.

Table 19. *Reason Descriptives*

**REASON**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Challenge | 53 | 72.6 | 72.6 | 72.6 |
| | Charity | 2 | 2.7 | 2.7 | 75.3 |
| | Health | 7 | 9.6 | 9.6 | 84.9 |
| | Other | 11 | 15.1 | 15.1 | 100.0 |
| | Total | 73 | 100.0 | 100.0 | |

Table 20 *Reason ANOVA*

**Reason ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| GD | Between Groups | 75.331 | 3 | 25.110 | .442 | .724 |
| | Within Groups | 3922.039 | 69 | 56.841 | | . |
| | Total | 3997.370 | 72 | | | |
| LD | Between Groups | 1.888 | 3 | .629 | 1.997 | .123 |
| | Within Groups | 21.746 | 69 | .315 | | |
| | Total | 23.634 | 72 | | | |
| PD | Between Groups | .505 | 3 | .168 | .522 | .668 |
| | Within Groups | 22.222 | 69 | .322 | | |
| | Total | 22.726 | 72 | | | |

To categorize the three measures (general self-efficacy, learning orientation, and performing orientation) for the analysis, the high, mid, and low levels assigned after the pre-survey, based on the tertiary splits for the three measures, were used.

As shown in Table 21, significant differences in the change in general self-efficacy and learning orientation were observed. Looking at the corresponding charts (Figure 3 and Figure 4), those in the low learning orientation category show the greatest increase in each of these scores; while those in the high category actually show a slight decrease. This is particularly significant because we would not anticipate seeing a decrease in these measures. On the change in performing orientation, the differences are not significant, but the same pattern of higher learning orientations leading to lower scores is seen (Figure 5).

Table 21 *Learning Orientation ANOVA*

|  |  | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| GD | Between Groups | 463.784 | 2 | 231.892 | 4.594 | .013 |
|  | Within Groups | 3533.586 | 70 | 50.480 |  |  |
|  | Total | 3997.370 | 72 |  |  |  |
| LD | Between Groups | 4.276 | 2 | 2.138 | 7.731 | .001 |
|  | Within Groups | 19.358 | 70 | .277 |  |  |
|  | Total | 23.634 | 72 |  |  |  |
| PD | Between Groups | 1.034 | 2 | .517 | 1.668 | .196 |
|  | Within Groups | 21.692 | 70 | .310 |  |  |
|  | Total | 22.726 | 72 |  |  |  |

GD – General Self-efficacy Delta, LD – Learning Goal Orientation Delta,
PD – Performing Goal Orientation Delta
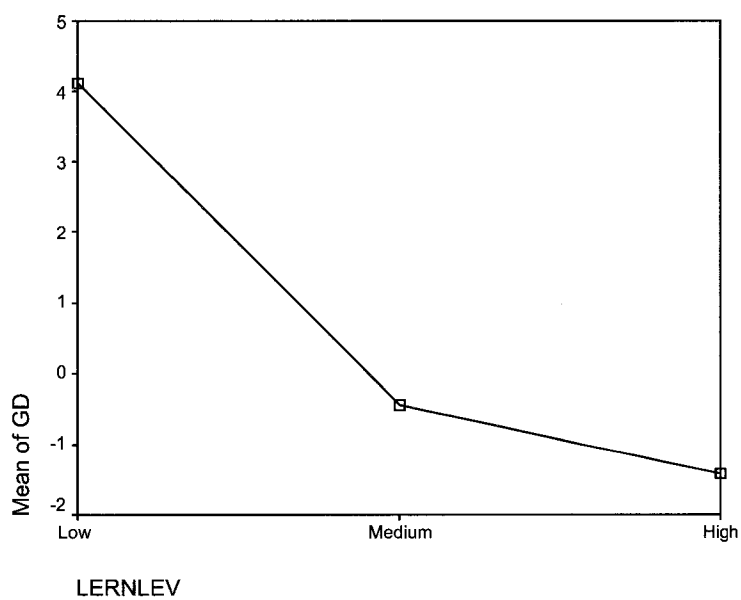
Figure 3. *Means plot—GSE score change versus learning orientation level.*
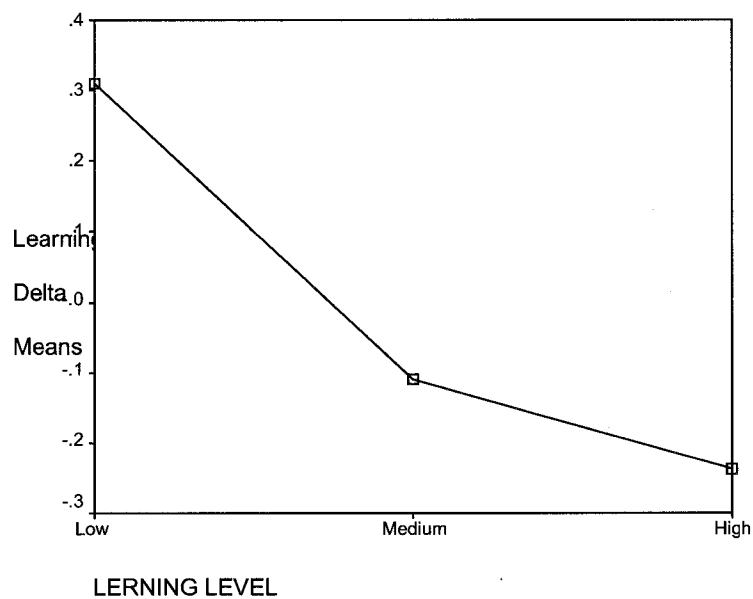


Figure 4. *Means plot—Learning orientation change versus learning orientation level.*
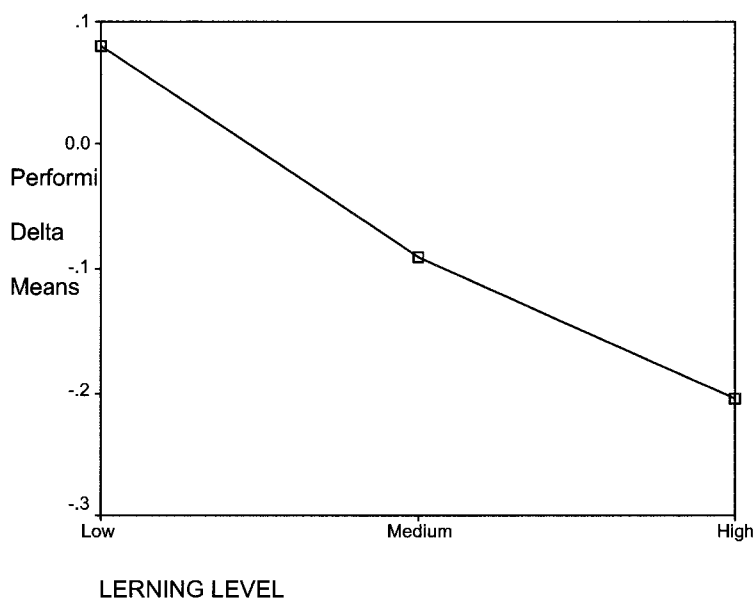
Figure 5. *Means Plot—Performing orientation change versus learning orientation level.*

As indicated by the ANOVA (Table 22), for levels of performing orientation, the

only measure that shows a significant different is change in performing orientation.

Although not at a significant level, for both changes in general self-efficacy (Figure 6)

and learning orientation (Figure 7), those in the mid-range show a decrease in performing

orientation, whereas those at either end show an increase. However, for change in

performing orientation (Figure 8), the difference is significant. In this case, those in the

low category show an increase, whereas those in the mid and high category demonstrate a

decrease.

Table 22 *Performing Orientation ANOVA*

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| GD | Between Groups | 20.187 | 2 | 10.093 | .178 | .838 |
| | Within Groups | 3977.183 | 70 | 56.817 | | |
| | Total | 3997.370 | 72 | | | |
| LD | Between Groups | 1.545 | 2 | .772 | 2.448 | .094 |
| | Within Groups | 22.090 | 70 | .316 | | |
| | Total | 23.634 | 72 | | | |
| PD | Between Groups | 1.887 | 2 | .943 | 3.168 | .048 |
| | Within Groups | 20.840 | 70 | .298 | | |
| | Total | 22.726 | 72 | | | |

GD – General Self-efficacy Delta, LD – Learning Goal Orientation Delta,
PD – Performing Goal Orientation Delta
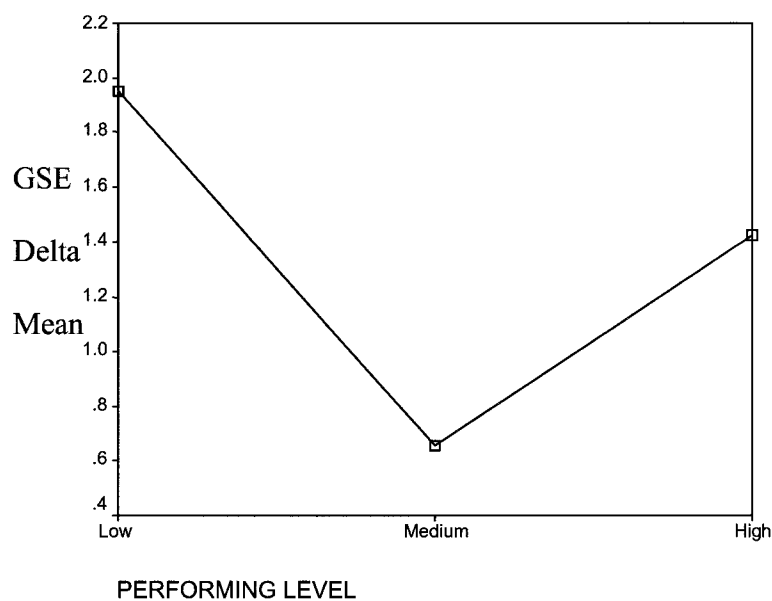


Figure 6. *Means plot—GSE change versus performing orientation level.*
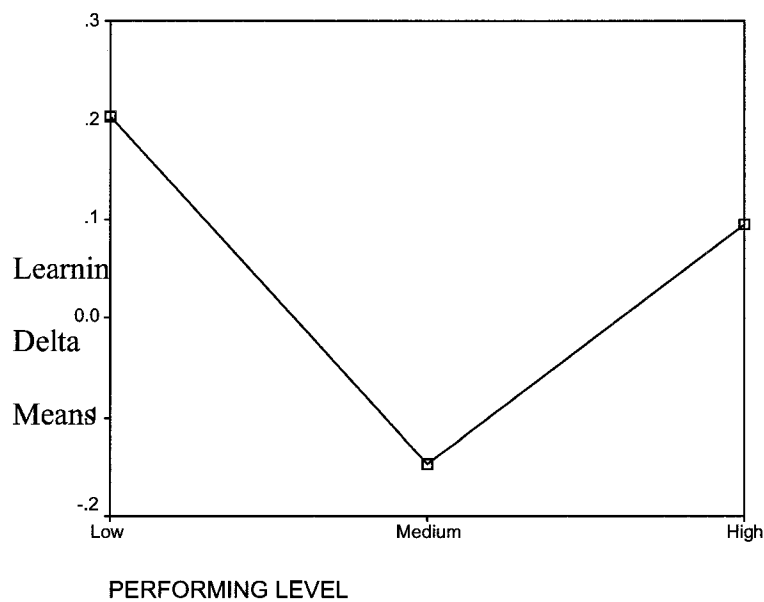
Figure 7. *Means plot—Learning orientation change versus performing orientation level.*
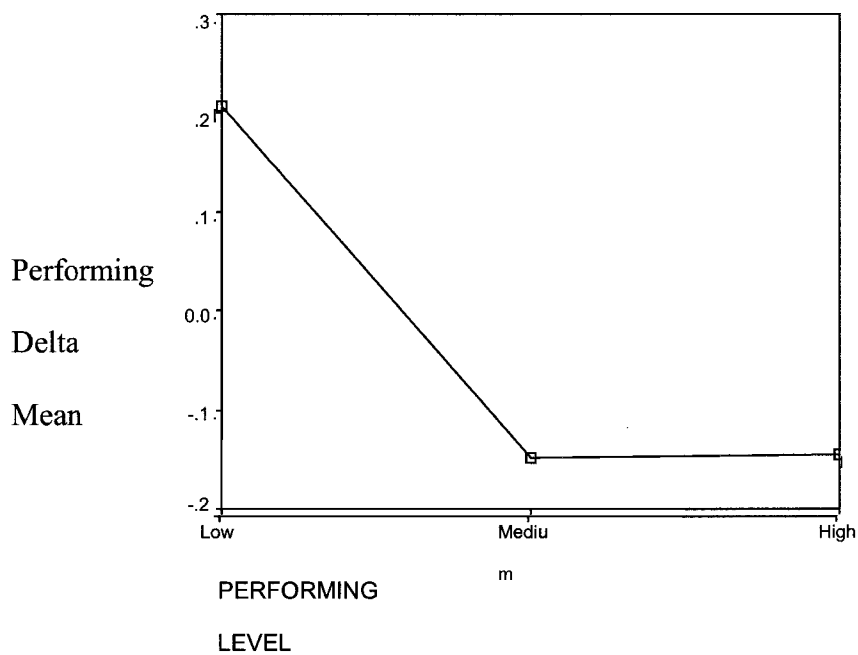


Figure 8. *Means plot—Performing orientation change versus performing orientation.*

Table 23, which presents the ANOVA, shows that both changes in general self-efficacy and learning orientation are significantly affected by the goal orientation level.

As with the levels of learning orientation, a slight decrease is seen for those at the high

end of the scales. For those at the low end of the scales, an increase is observed. This is

true for both changes in general self-efficacy (Figure 9) and learning orientation (Figure

10). Performing orientation (Figure 11) did not show this same pattern.

Table 23 *General Self-Efficacy ANOVA*

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| GD | Between Groups | 1111.052 | 2 | 555.526 | 13.473 | .000 |
| | Within Groups | 2886.318 | 70 | 41.233 | | |
| | Total | 3997.370 | 72 | | | |
| LD | Between Groups | 1.972 | 2 | .986 | 3.186 | .047 |
| | Within Groups | 21.662 | 70 | .309 | | |
| | Total | 23.634 | 72 | | | |
| PD | Between Groups | .378 | 2 | .189 | .591 | .556 |
| | Within Groups | 22.349 | 70 | .319 | | |
| | Total | 22.726 | 72 | | | |

GD – General Self-efficacy Delta, LD – Learning Goal Orientation Delta,
PD – Performing Goal Orientation Delta
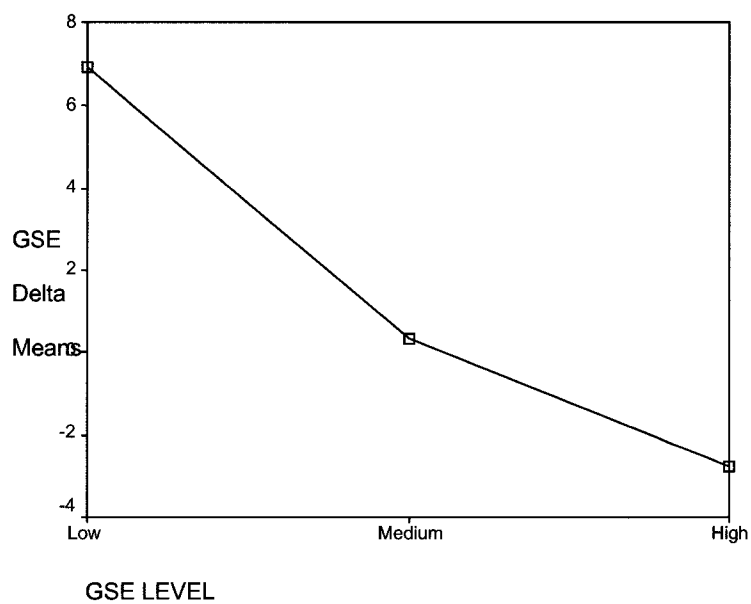
Figure 9. *Means plot—GSE change versus GSE level.*
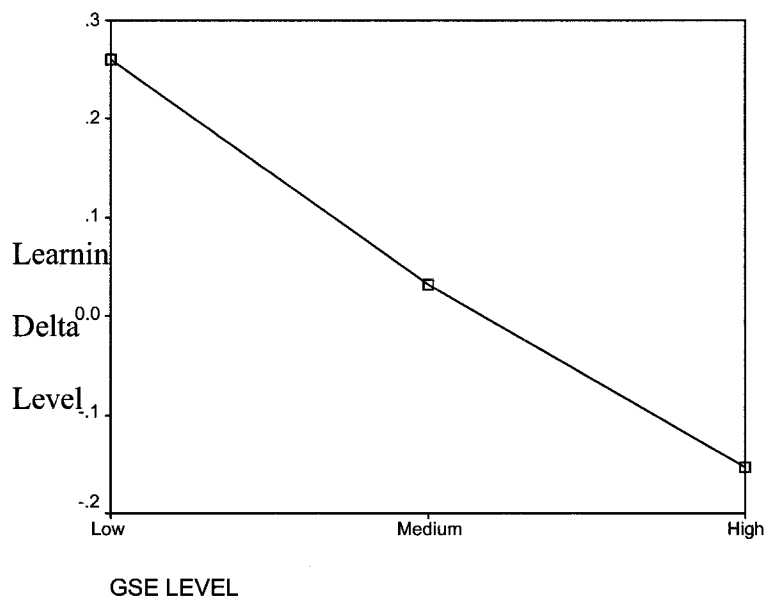


Figure 10. *Means Plot—Learning orientation change versus GSE level.*
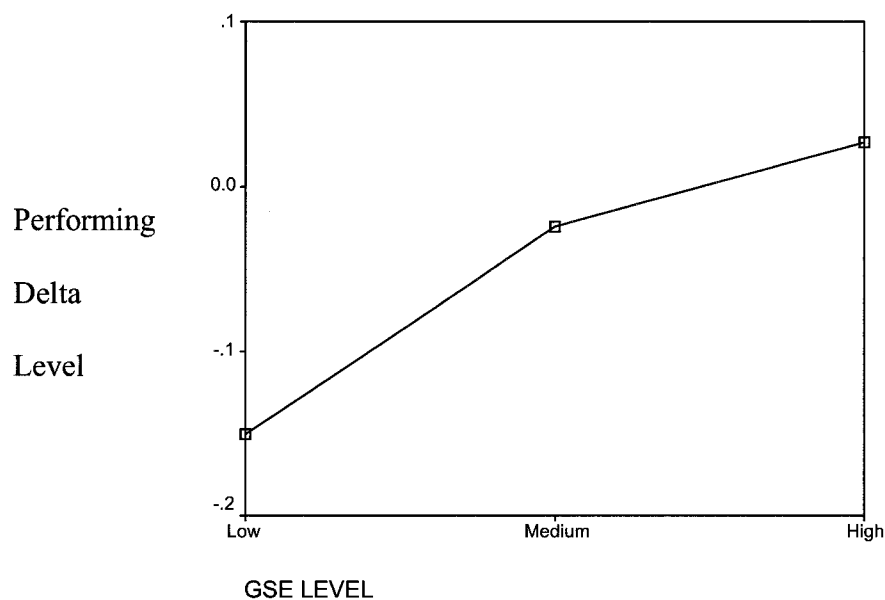
Figure 11. *Means plot—Performing orientation change versus GSE level.*

The final statistic that was performed was a univariant ANOVA. The univariant

ANOVA differs from the one-way ANOVA in that the univariant allows for multiple

factors to be investigated together. Through this analysis, we can tell if the combination

of any of the factors plays a significant role. Table 24 summarizes the data from running

the ANOVA analysis. None of the combinations of measures showed a significant

influence on the change in general self-efficacy. The only relationship that had been

hypothesized under these conditions was that the combination of initial performing

orientation and initial general self-efficacy would influence the change in self-efficacy

($H_{1a}$). Here again there is insignificant evidence to support the hypothesis and thus it is

not accepted.

Table 24 *Between-Subject Effects for Univariant ANOVA*

**Tests of Between-Subjects Effects**

Dependent Variable: GD

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 1788.422[a] | 21 | 85.163 | 1.966 | .025 |
| Intercept | 6.396 | 1 | 6.396 | .148 | .702 |
| PERFLEV | 125.748 | 2 | 62.874 | 1.452 | .244 |
| LERNLEV | 11.950 | 2 | 5.975 | .138 | .871 |
| GSELEV | 385.335 | 2 | 192.667 | 4.448 | .017 |
| PERFLEV * LERNLEV | 173.685 | 4 | 43.421 | 1.003 | .415 |
| PERFLEV * GSELEV | 233.077 | 4 | 58.269 | 1.345 | .266 |
| LERNLEV * GSELEV | 96.126 | 3 | 32.042 | .740 | .533 |
| PERFLEV * LERNLEV * GSELEV | 44.181 | 4 | 11.045 | .255 | .905 |
| Error | 2208.948 | 51 | 43.313 | | |
| Total | 4121.000 | 73 | | | |
| Corrected Total | 3997.370 | 72 | | | |

a. R Squared = .447 (Adjusted R Squared = .220)

*Summary*. This section presented the statistical analysis for the two top level

hypotheses. These hypotheses sought to determine if significant changes in pre- and post-

survey scores existed for the first-time marathoners in terms of general self-efficacy and

learning orientation. Based on these statistics, a significant change has not been

demonstrated. Specifically:

$H_{1a}$: Individuals with an initial high score on the self-efficacy scale and a high

performance orientation will experience significantly less change in self-efficacy

than those with either an initial low self-efficacy score or a low performance

orientation.

The univariant ANOVA indicates this relationship is significant at .266 level, which is above the acceptable .05; therefore the research hypothesis is not accepted.

$H_{1b}$: Individuals with a high initial learning orientation will experience a significantly greater increase in self-efficacy than those with a low initial learning orientation.

The correlation analysis indicates a statistically significant relationship exists at .028, which is lower than the acceptable .05. However, the correlation is negative, indicating the reverse of this hypothesis; therefore the research hypothesis has been rejected.

$H_{2a}$: Individuals with slower completion times will show significantly higher learning orientations than those with faster completion times.

Although this correlation is in the anticipated direction, it is not at a statistically significant level. The significance level is .205, which is higher than the acceptable .05; therefore the research hypothesis is rejected.

$H_{2b}$: Individuals with faster completion times will show significantly higher performance orientations than those with lower completion times.

The correlation for this hypothesis indicates that individuals with slower completion times show a higher performing orientation. The significance level is .288, which is higher than the acceptable .05 and the correlation is in the inverse direction. The research hypothesis is rejected.

$H_{2c}$: Older Individuals will show significantly higher learner orientations than younger individuals.

The correlation for this hypothesis indicates that older individuals show a lower learning orientation. The significance level is .892, which is higher than the acceptable .05 and the correlation is in the inverse direction. The research hypothesis is rejected.

H3a: Those with a low desire for a specific completion time will show a significantly higher learning orientation than those with a high desire for a specific completion time.

The correlation for this hypothesis indicates that individuals who feel a stronger drive to complete within a specific time show a higher learning orientation. The significance level is .88, which is higher than the acceptable .05 and the correlation is in the inverse direction. Thus the research hypothesis is rejected.

H3b: Those with a high desire for a specific completion time will show a

significantly higher performing orientation than those with a low desire for a

specific completion time.

Although this correlation is in the anticipated direction, it is not at a statistically

significant level. The significance level is .87, which is higher than the acceptable

.05. Therefore the hypothesis is rejected.

*Reliability and Validity*

*Cronbach's α*

Cronbach's α was used to determine the inter-item scale reliability for each of the

instruments used for this study. All three measures demonstrated excellent item

reliability. The α calculated for Sherer's (1982) General Self-Efficacy scale was .90,

compared with Sherer's measure for this scale, which was .81 (Table 25). The α

calculated for Button et al.'s (1996) Goal Orientation scales were .90 for learning and .79

for performing, compared with the results of .79 and .73 from the original studies (Table

26). These results were calculated based on the 192 participants who responded to the

initial survey. The implication of this is that the reliability of all three scales is more than

adequate. See Appendix J for the data that were used to calculate these Cronbach values.

Table 25 *Sherer (1982) General Self-Efficacy Cronbach α*

|  | Marathon runners N=192 | Sherer (1982) N=101 |
|---|---|---|
| General - Self-efficacy | .90 | .81 |

Table 26 *Button et al. (1996)—Goal Orientation Cronbach α*

| | Marathon runners N=192 | Button et al. (1996) N=1441 |
|---|---|---|
| Button et al. (1996)—Learning orientation | .90 | .79 |
| Button et al. (1996)—Performing orientation | .79 | .73 |

*Phase 1 Summary*

This section summarized the results of the quantitative portion of the study. The research questions that this data responds to are:

1. What change in self-efficacy do individuals realize by virtue of training for and completing a marathon, as measured by Sherer's (1982) General Self-Efficacy (GSE) instrument?

2. What change in goal orientation do individuals realize by virtue of training for and completing a marathon, as measured by Button, Mathieu, and Zajac's (1996) Goal Orientation instrument?

3. What is the relationship between the change in self-efficacy and the change in goal orientation?

4. What is the relationship between an individual's reason for taking on the challenge of the marathon and that person's goal orientation?

According to the data, individuals did not show a significant change in any of the three measures of self-efficacy, learning orientation, and change in performing orientation. However, the data support the finding that the participants for this study started with higher scores than are typically seen. Although significant changes were not

seen, a slight increase in both general self-efficacy and learning orientation was observed. Conversely, a slight decrease for performing orientation was observed.

Significant relationships were found for all three measures based on the tertiary split of the data. For both general self-efficacy level and learning orientation level, a significant impact was seen on the change in each of these measures (general self-efficacy and learning orientation). This significant difference was the inverse of what was anticipated. Those at the low end of the scale saw increases in both scores, and those at the high end saw decreases. For the levels of performing orientation, significant influence was only seen on change in performing orientation; as with the other two measures, those at the low end of the scale showed an increase, whereas those at the high end showed a decrease. Finally, the only other measure that showed a relationship with one of the three measures was "days until the marathon." There was a statistically significant positive correlation between those who registered for their marathon early and learning orientation.

<div align="center">Phase 2</div>

This section for phase 2 is divided into seven sections. The first section summarizes the results from the short-answer question included with the follow-up survey. The short-answer questions were included with the follow-up survey. All participants were asked if they felt they had changed, and if so how. They were also asked if they felt these changes would affect how they approached tasks in the future, and if so how. The next sections discuss the findings from the interviews. These sections summarize: the changes in confidence levels, the changes in goal setting views, the changes in performance views, the importance of others, and the nature of the

transformative learning that was experienced. The next section will summarize these results.

*Short-Answer Responses*

All participants were asked to indicate if they had changed as a result of having trained for and completing a marathon. If they responded *yes* to this question, they were asked to indicate how. To determine if the responses (yes or no) were related to changes in any of the three measures (general self-efficacy, learning goal orientation, and performing goal orientation), analyses of variance were used. The results of these tests (Table 27) indicated there is no difference based on any of the three scales. Table 28 and Figure 12 indicate 75% of the participants felt they had changed.

*No Change Response*

Follow-up correspondence with those who indicated they had not changed revealed that 100% had prior experiences they felt were more challenging than the marathon.

Examples of these responses are:

I'm married, and we bought our own home and I went back to Law School four nights a week as an adult (30) and worked full time in the late 90s. During this time, my mother came down with cancer twice and eventually died. My father in law had two strokes and eventually died. Several other family members died during my four years at school. My life during those four plus years was nothing other than an endurance event of work, school, homework, housework, hospital visits, and emotional roller coasters. In all reality, I doubt I could become a brain

surgeon or work on the space shuttle, but I'm pretty confident that if I wanted to learn something and do it, I could and would once I took it upon myself.

I have completed medical school and four very difficult years of residency. I have gone through a divorce, and I am now a single mother of a toddler, going to school, working, etc. I almost feel like it is tougher for me to get through my week than it was to complete a marathon.

I think the most challenging event (which is not a physical one) in my life was completing my Ph.D. (in chemistry).

Table 27 *Changed Versus not Changed ANOVA*

**ANOVA**

|   |   | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| GD | Between Groups | 8.167 | 1 | 8.167 | .146 | .704 |
|   | Within Groups | 3919.333 | 70 | 55.990 |   |   |
|   | Total | 3927.500 | 71 |   |   |   |
| LD | Between Groups | .100 | 1 | .100 | .304 | .583 |
|   | Within Groups | 23.079 | 70 | .330 |   |   |
|   | Total | 23.179 | 71 |   |   |   |
| PD | Between Groups | .378 | 1 | .378 | 1.212 | .275 |
|   | Within Groups | 21.844 | 70 | .312 |   |   |
|   | Total | 22.223 | 71 |   |   |   |

Table 28 *Changed Versus not Changed*

**CHANGED**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | yes | 54 | 74.0 | 75.0 | 75.0 |
|  | no | 18 | 24.7 | 25.0 | 100.0 |
|  | Total | 72 | 98.6 | 100.0 |  |
| Missing | System | 1 | 1.4 |  |  |
| Total |  | 73 | 100.0 |  |  |

## CHANGED
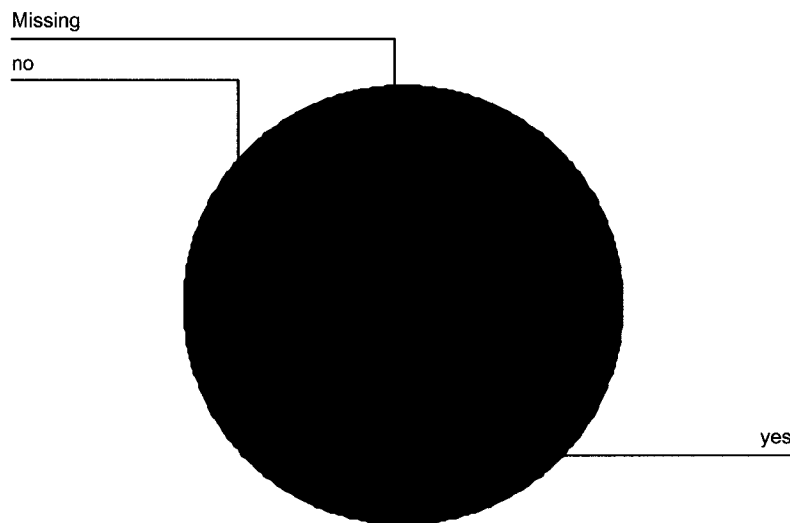


Figure 12. *Changed versus not changed.*

*Change Response, Yes*

Table 29 and Figure 13 summarize how participants felt they had changed; 58% indicated their confidence had risen as a result of having completed the marathon, 14% listed "physical changes," and 10% indicted that change in goal setting tactics was their most important change. Answers for the remaining 18% of respondents fell into the

categories of more determination, more motivation, less fear, and more discipline.

Samples of responses in each of these categories follow.

*More confidence.*

Higher self-esteem from completing my goal of crossing the finish line. Sense of accomplishment. Empathy, increased admiration, and respect for other marathoners and high endurance athletes. I no longer feel the need to "broaden my horizons" with new things. I just want to get better/learn more about the things I do now. More confident in my ability to do things.

I feel like I can handle any challenge that comes across my path now.

I feel more confident in my running, my ability as a person. I felt I learned a great deal about myself and look forward to the challenges of the future.

My lifestyle has changed, and I feel like I can accomplish more.

More confidence in my ability to meet goals.

*Physical*

My fitness level is much improved.

It did improve my body image slightly, performance over appearance.

I know I can accomplish physical tasks I once thought were unachievable.

*Goal setting/pacing.*

I don't think I'm very spontaneous, so the slow buildup to a marathon was a good fit for my personality.

I have come to realize that goals that are physically challenging, such as training for a marathon, involve and affect the whole person. I have had a little time to reflect/meditate on how my journey is applicable to other situations in my life as well as learning the value of rest during the training and afterwards.

I feel like I set a goal, stuck to my training plan quite religiously, and accomplished my goal within my estimated time. I feel that I accomplished something great by finishing. I have learned to pace myself, take risks we needed, challenge myself, and approach what appears to be an obstacle differently.

Making goals, and sticking to it.

*More determination.*

I learned that I can be pretty stubborn when I decide on something as a goal—in this case, not because of the preparation, but because it was too hot for me to run as well as I wanted to and I had to resolve that I was going to finish in spite of how I felt.

I feel I have become more determined individual. Miles 20-26 were all about determination and a desire to finish.

*More motivation.*

Knowing I have completed something that not everyone has gives even more motivation to try new things.

Completing my first marathon in less than ideal health conditions confirmed that sometimes one's passion to win can carry you through tough times.

Realize that I can stick to a training program that lasts for several months. Realize that I can self-motivate to accomplish a difficult task.

*Less fear/less critical.*

I have changed my perspective. I am somehow a little less critical of myself in that area. I am proud of my accomplishment without disappointment, which is huge for me. I am astonished at what my mind and body can do.

I don't view running as a competition and I am not as anxious about what I might look like when I run.

*More disciplined.*

I have become more disciplined in all areas of my life, and happier.

More disciplined, patient.

I feel like I have added discipline to my schedule and made exercise an important part of my daily routine. I also feel that having set a goal I was able to stick to it and complete it. It did my ego a lot of good.

Table 29 *How Changed*

**How Changed**

|       |                         | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------------|-----------|---------|---------------|--------------------|
| Valid | physical                | 8         | 13.6    | 13.6          | 13.6               |
|       | confidence              | 34        | 57.6    | 57.6          | 71.2               |
|       | goal setting / pacing   | 6         | 10.2    | 10.2          | 81.4               |
|       | determination           | 2         | 3.4     | 3.4           | 84.7               |
|       | motivation              | 3         | 5.1     | 5.1           | 89.8               |
|       | less fear / less critical | 3       | 5.1     | 5.1           | 94.9               |
|       | disciplined             | 3         | 5.1     | 5.1           | 100.0              |
|       | Total                   | 59        | 100.0   | 100.0         |                    |

## How Changed

disciplined

less fear / less cri

motivation

determination

goal setting / pacin

physical

confidence
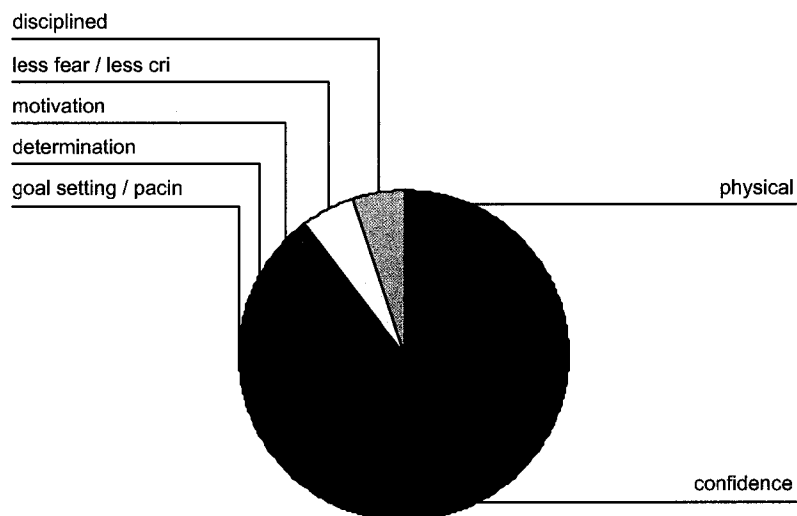
Figure 13. *How changed.*

*Future Change Response*

Participants were asked if the marathon experience would affect how they would

approach tasks in the future. The ANOVA (Table 30) calculation indicates no significant

difference in the responses based on the participants' initial goal orientation. Looking at

Table 31 and Figure 14, 69% of the participants felt this would affect their future.

Table 30 *Impact on the future ANOVA*

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| GD | Between Groups | 22.751 | 1 | 22.751 | .406 | .526 |
| | Within Groups | 3974.619 | 71 | 55.981 | | |
| | Total | 3997.370 | 72 | | | |
| LD | Between Groups | .000 | 1 | .000 | .001 | .980 |
| | Within Groups | 23.634 | 71 | .333 | | |
| | Total | 23.634 | 72 | | | |
| PD | Between Groups | .584 | 1 | .584 | 1.872 | .176 |
| | Within Groups | 22.142 | 71 | .312 | | |
| | Total | 22.726 | 72 | | | |

Table 31 *Impact on the Future*

**FUTURE**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | yes | 50 | 68.5 | 68.5 | 68.5 |
| | no | 23 | 31.5 | 31.5 | 100.0 |
| | Total | 73 | 100.0 | 100.0 | |

## FUTURE
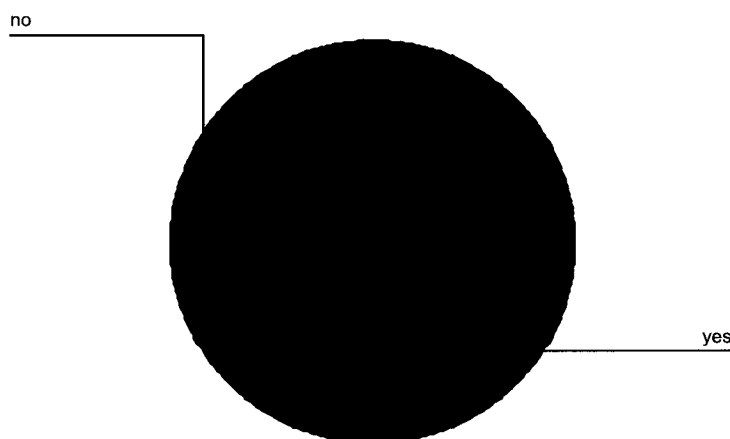


Figure 14. *Impact on the future.*

Table 32 *Future Implications*

**Future Implications**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | physical | 1 | 1.9 | 1.9 | 1.9 |
| | confidence | 15 | 27.8 | 27.8 | 29.6 |
| | goal planning | 20 | 37.0 | 37.0 | 66.7 |
| | determination | 7 | 13.0 | 13.0 | 79.6 |
| | motivation | 2 | 3.7 | 3.7 | 83.3 |
| | less fear / less critical | 6 | 11.1 | 11.1 | 94.4 |
| | disciplined | 2 | 3.7 | 3.7 | 98.1 |
| | optimistic | 1 | 1.9 | 1.9 | 100.0 |
| | Total | 54 | 100.0 | 100.0 | |

**Future Implications**
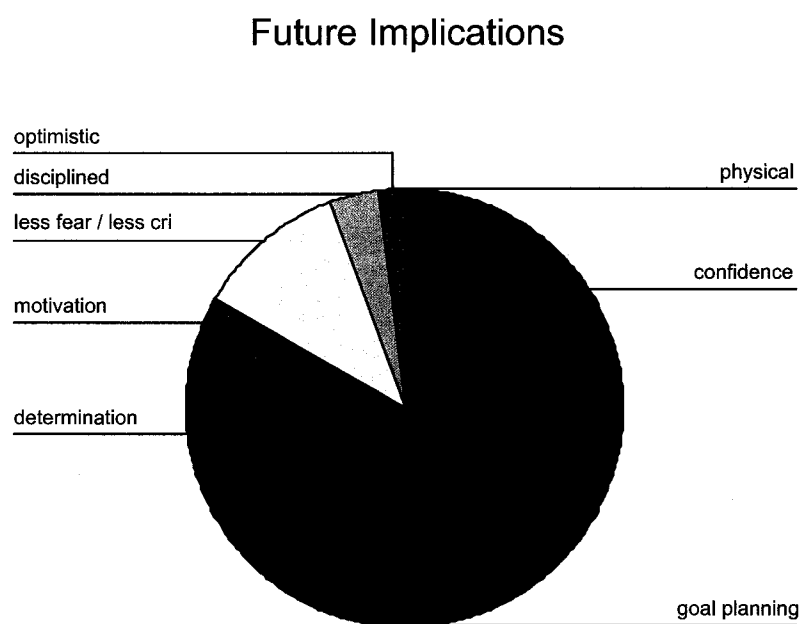


Figure 15. *Future implications.*

Table 32 and Figure 15 summarize what impact participants felt the change would

have on their future; 37% indicated their approach to goal setting and planning would

change. Having more confidence followed closely at 28%. More determination was next at 13%. Close behind this at 11% was having less fear. Answers for the remaining 11% of respondents fell into the categories of more determination, more motivation, more optimism, and physical changes. Samples of responses in each of these categories follow.

*Goal setting and planning.*

By setting goals—small ones that lead to the ultimate, larger goal—confirms that I need to remember to break tasks down into smaller portions of the whole to succeed.

It's made me look for longer term goals in the rest of my life.

Breaking things down into small chunks to make things manageable, also being aware that slow and steady will get the job done.

I am not as worried about immediate results.

*Confidence.*

Nothing is impossible now!

I think I will have more confidence in my ability to do activities/projects I am asked to do.

I feel that if I can run a marathon, I can do anything! I am more confident in all areas of my life and feel like a much more well-rounded person.

I know I can accomplish goals, so I will not shy from any challenge.

I won't say "never" as often.

*Determination.*

I know I can do them if I really want to and if I am willing to put in the time required.

Endurance in keep trying no matter how long it takes.

I learned that only through hard work and dedication can you succeed.

*Less fear/less critical.*

Less reluctant to take projects on.

I am not the best runner my any means, but since running in the Chicago Marathon, I feel like I can try new tasks that I am not the best at and not care so much if I will be good at that task.

I think I will be more patient with myself and approach things more methodically.

If there is something I really want to do, I will at least give it my best shot instead of assuming it is not possible.

I'm not afraid to fail.

*Disciplined.*

I have learned (and am still learning) the value of being disciplined in life. Whether it is running a marathon, making a presentation, or giving a speech, it is important to show up to the "starting line" prepared, rested, and fresh. Confidence must exude from within me and I cannot think of the what-ifs, the should's, or wishes of what I could have done differently to hopefully improve my time. I have to focus on the present and enjoy each moment. Then I can reflect after I'm done and focus on what I can do differently to improve myself for the next time.

The way? Well, it's not just this particular marathon, but my approach to fitness has regimented my life and how I schedule time to work out, etc. It has extrapolated into other areas of my life, too—professional, home life, etc.

*Motivation.*

When I see something ahead of me that's going to be difficult, I can think of my past achievement, and that's a motivator.

Now that I have completed the marathon, I have a nice base for approaching other tasks that may be difficult. I can pull from "I ran a marathon" that is incentive to try harder for other things.

*Optimism.*

Be more optimistic now.

*Physical changes.*

It will change how I approach my next marathon training and race.

### Follow-Up Interviews

Interviews were conducted to ensure a broad spectrum of participants were included. Participants at both extremes of goal orientation were included; that is, based on the tertiary split of the data from the pre-survey, participants who scored low on both performing and learning orientation, as well as those who scored high on both these scales and those who scored high on one scale and low on the other. Additionally, participants had identified one of four reasons for partaking in the marathon: challenge, charity, health, and other. Participants were selected for the follow-up interviews to ensure each of these categories was included.

The breakdown of the number of participants based on learning orientation was:

Low learning orientation/low performing orientation: 3

Low learning orientation/high performing orientation: 5

High learning orientation/low performing orientation: 3

High learning orientation/high performing orientation: 3

Other: 7

"Other" in this situation indicates either (or both) of the goal orientation measures

fell into the mid-region.

The breakdown based on reason for partaking in the marathon was:

Challenge: 8

Charity: 2

Health: 5

Other: 6

No significant themes arose that were distinct to any of the elements based on

either of these groupings. Thus, no further distinction based on these groupings will be

presented. The interviews focused on the changes experienced as a result of completing

the marathon. The themes that emerged through this focus were: confidence changes,

goal setting changes, views on performance changes, the importance of the role of

"others," and finally the nature of the transformative learning. Each of these themes is

discussed in the following sections.

*Confidence Changes*

The confidence theme typically appeared directly in the interviews. When

participants were asked how they had changed, almost invariably their first response was

in terms of having more confidence.

Examples of this can be seen in such phrases as:

My self-confidence in everything has really increased.


Definitely made me a more confidence person.

I feel more confident that I can accomplish other things.

I'm capable of more than I thought I was.

I would say my self-esteem has gone up a great deal.

It makes you feel like you can accomplish anything.

It gives you a lot of confidence that you can go out and achieve something. That's probably the number one thing.

Others described in detail this shift in confidence. One participant described always doubting herself before taking on a new challenge; now she has what she describes as a "superiority complex."

Do you want to know how—I don't know if I can really say—for one thing, this is probably the most challenging thing I've done in my entire life. And when I started it, I had no idea what I was in for. Then the fact that I actually did it makes me feel like all the stupid things I've avoided doing are just stupid. If I can do this, I can do anything. I feel like I'm on this superiority complex. "

Another describes feeling like she has been able to push past the road blocks that have held her back from taking on challenges that would allow her to fulfill other goals in her life.

> Let me tell you. I have all these ideas of these things I want to do. But there just is something—I'm not sure what it is, lack of confidence, insecurity. I guess that is the same thing. For whatever reason, I just never seem to. I now the steps I need to take, but I just don't seem to. I'm not able to put flesh on those dreams. I'm not sure why. It just seems that I was able to push past that and I've been able to see tangible results of that.

A third participant relates what, on the surface, appears to be an insignificant task: having the confidence to change a tire. But, for her, in the past it was something she would not even consider.

> This morning I was supposed to be here to open up and I had a flat tire on the interstate. I'm thinking, "Oh great. I called the service manager, and he didn't have his phone on. I called AAA and I got put on hold." And I thought, you know, what. I threw my phone in the car. We've only had the car a couple weeks, so I didn't know where the jack was or how to use it. So I got the owner's manual out and changed the thing myself and came on to work, and I was only about 15 minutes late. I thought to myself, you know, I can do these things.

As a lawyer in the group so nicely summed up this feeling of new-found confidence, "I don't want the small fish anymore."

> These changes in confidence were described by most of the interview participants, each attributing this change more to the training than to the actual marathon. They described the marathon more as a validation point than as the apex of their confidence change. Most of the participants, who described this change in confidence, went on to describe how they now approach challenging goals.

*Goal Setting Changes*

The changes participants described in terms of goal setting varied greatly. For some, it has been breaking larger tasks into smaller manageable chunks, which includes the planning that goes along with it. For others, it is being able to see the ultimate goal to get through all the steps. But all agreed that pacing and planning and keeping one's eye on the ultimate goal constitute the recipe for success in all tasks.

In terms of how participants felt they were already breaking tasks down, responses include:

> Being in business, I've always broken into manageable chunks. So, personally, I don't see that it's that different.

> Not more inclined than I was before. I was always someone who does that. We have a larger goal in mind, but this is what we have to do first—A B C. . . I always did that before. I don't think it has made me more or less than that.

However, more participants described how they see they are now more inclined to break large tasks down into smaller chunks. An important element of breaking these tasks into smaller chunks is pacing. Whereas before they had an all-or-nothing approach to completing large tasks, now they set out smaller goals and keep a steady pace to accomplish the ultimate goal. The following snippets demonstrate this inclination towards pacing.

> The honey do list was getting long. I did more in one day than I've done in a longer time.

I don't know. I think in a way yes. Never before on any project I've done have I had a program outline in front of me. Like "on this day you do this many mile" thing. And I filled out my grid every single day. I liked that because I felt like it was an attainable goal. I could see the countdown. I could see the dates. By writing everything down, it didn't seem as enormous to me. You know, when I do projects—not so much at work, but at home—I think if I broke it down, it wouldn't seem so enormous to me.

I just got a task for a committee I'm on and I wrote down exactly what I needed to do, and I've never done that before. I would just sort of tackle things, but now I feel like I need to get a little organized. If I do a little at a time, it's going to make me feel like I'm accomplishing something. Rather than just the end result. So it is helpful to break up things.

Funny you should say that. I am working on a very, very large file. It's a construction case. I work for a law firm. Everyone is suing everyone. I have one plaint with eight defendants. So I'm trying to sort out who send correspondence to whom, who sent documents to whom. And I finally asked the copier if she would just feed them to me, the 32 boxes. So every time she copies a box, she sends it to me. And I break it down and catalogue it and index it and find out what documents are in there. Normally, I'd just say, "Just give me everything and I'll fight through it" but I am breaking things down into smaller bits and it really helps.

I started to. . . Before I would just kind of jump right in and hope it went well. But now I'm more apt to say, "Here's my goal. What do I need to do?"

Breaking down some of these things that were so daunting. A lot of dreams that I've had, I see them happening now.

That's huge. You know how people make New Year's resolutions? I have a hundred resolutions. I'm a project manager at work. I manage 80 people and all I'm doing all day is writing short-term, medium-term, and long-term goals. It's helped me out a lot because I was always so short-term focused. It was hard for me to realize things to an end of six months to a year to five years. I couldn't imagine. I break it down. Now I set out a plan. I know now I can do it, even if I have to push hard at the end. It actually helped me more in the long-term planning, as well.

By setting out a plan of short-term goals, which lead to the ultimate long-term goal, all of these participants have been able to change their perspective on how to accomplish much more than they had every accomplished before. This changing of goal orientation is only one element that has led to a change in their beliefs, so that they now believe that they can accomplish much more than they had ever dreamed they could. The other element that plays a key role in this change is a more forgiving nature.

*Views of Performance Changes*

This forgiveness is seen in terms of the shift in how participants judge their performance. Several participants described how they are now less critical of themselves. They described how they are now willing to take failure as a learning opportunity, rather than needing to reach instant perfection. By being willing to accept their best as the stepping stone to doing better, they have found it less frightening to attempt new challenges.

One participant says, "I was thinking, if I don't finish in five hours, I'll be really miserable. But somewhere around mile 20, I completely lost the ability to criticize myself." She has been working since then to hold onto that feeling and apply it to other aspects of her life. Several participants described wanting to change careers at this point. Whereas, before the marathon experience, they were convinced their ability to perform their preferred career was limited, now they understand the need to accept a learning curve.

Another participant described the illusive nature of the goal. He described realizing the futility of beating himself up over not having done better because, regardless of his accomplishment, he would always want to do better. Therefore, he is now content to enjoy the journey.

Other than thinking that I was busting my own chops and hard on myself for not really showing a great time on my first marathon, there will always be an illusive goal. And I think that's the whole point of it.

This shift in perspective is described by another participant as "definitely did my ego a lot of good." By being more accepting of shortcomings, the participants in the

survey have found taking on new challenges less daunting. They have found the journey of mastering the skill to be the true challenge - that the ultimate completion of the goal is merely the public recognition by others that they have accomplished the goal.

*Others*

The role of others in the marathon experience is multifaceted. Several of the participants took on the challenge because someone else either persuaded them to or was enough "like them" that they felt "if they can do it, I can." Registering for the event brought an added commitment to the challenge because they had to make a "public announcement" of their intentions. Once others were aware they had signed up for the marathon, the participants felt a strong need to be sure to complete it. Although the participants described exhilaration at completing the marathon, most were able to point to a time during the training when they knew they were going to accomplish the task. The completion was simply a public validation of what they had done, and they could now wear the badge of honor for others to see. The last aspect of "other" that emerged from the interviews was the desire to bring others into the club–the desire to persuade someone else that they, too, could complete the challenge of the marathon. Examples of comments for each of these instances follow.

*Persuasion.*

I ran the race with my twin brother.


I had a friend who trained with me.


My husband ran the marathon with me.

I did it with my fiancée.

*Like me.*

If Fred (not actual name) can do it, so can I. He drinks and smokes and he's

practically blind, so he's running into people. After running for awhile, I realized,

yeah, he does all this, but he's running better than I.

That's the other thing I noticed at work. I was taking more notice of the first

timers. I felt as though I could compare myself to them because, you know,

usually they were people who where not runners by nature, but had decided to do

it. I figured I'd be much like them. What I notice. . . the people that were doing

those sorts of things were successful. That's the other thing that appealed to me. I

figured then I'd be like them and be a successful person.

*Registration.*

I didn't even register for the marathon till maybe two months before it. I knew I

was going to do it, but I didn't pull the trigger until maybe two months before it.

So I'd been training up until that time. But then I think what kept me going—

there's no turning back. Even if you crawl, that's fine, but you're doing it.

I needed motivation. I paid the money, then I got one of the programs off

*Runner's World.* It was an 18-week program, and I followed then and I was ready.

*Public recognition.*

Around here, it's a real feather in your cap. They have it on the front page of the paper. A lot of people come in congratulating you.

I think its changed people's perception of me. When I first told my family, my mom was like, "Do you really think you can do this?" Not really negative. It was just like, "You're taking on too much this time." Everyone just can't believe it. They look at me differently, as someone who doesn't blow smoke, but like someone who actually follows through and takes on challenges. And that's important to me. It's given everyone a chance to see that.

*Recruitment.*

I try to explain it to people that haven't run 400 meters, and you get to this place where literally time stops, and you're able to focus and you wish you had that for so many other. . . "

I changed. Like my brother who's always been in good health and likes to lift weights and likes to run on and off. He's gotten back into running.

My goal is to get someone else to do it.

*Transformative learning*

All of these aspects—the change in confidence, the change in goal setting tactics, and the change in performance expectations—led the participants to believe they had changed, that they were no longer the same person they had been when they started their endeavor towards the marathon. Their basic assumptions about themselves had been deeply and profoundly altered. Although each participant expressed an emergent aspect of the transformation, all were able to identify significant incidents within the training when they realized they had learned something significant about themselves.

*Emergent transformation.* Emergent transformation was general in nature. No one could point to a specific moment when questioned about (a) when he or she was aware their confidence had changed, (b) when he or she believed they were capable of taking on new changes, and/or (c) when it was that he or she became more forgiving of themselves. The marathon itself was not what made the difference; rather it was the training that brought them to this new level of understanding of themselves. The marathon brought about the public validation, but the change had already taken place before that day.

The marathon as an event itself I don't think would have done it.

I think I've seen the change in the last two or three weeks. I perceive a change.

I'll say reflecting back. But I'll say there was a time when I realized, "Yeah, I like this."

We are all constantly changing. It's more the nature of the change that is taking place.

You know, honestly, I don't really know. I think everything everyone does every day shapes who we are.

*Phase 2 Summary*

The qualitative portion of this study sought to understand the findings from the quantitative portion; specifically, seeking to answer the final research question: How do first-time marathoners know their perspective has transformed by virtue of training for and completing their first marathon? These learnings fell into four categories: (a) significant changes in confidence were expressed, (b) changes in how goals were set, (c) a more forgiving nature developed, and (d) the impact that others had on them. This impact of others was expressed both in terms of (a) how others encouraged them to take on the task and (b) how they gained validation for their achievements. Emergent learning transformations were experienced through reflecting back over the course of the training. The recognition was that, through setting small goals and through pacing, any goal is achievable.

Summary

The quantitative and the qualitative portions of this study seem to indicate conflicting results. In the quantitative portion, there is no statistical support for the participants' changes in self-efficacy, yet in the qualitative portion the participants are adamant that they are now capable of taking on any challenge. Chapter 5 articulates the interpretation of these findings, discuss their potential implications, and draw conclusions

from the synthesized data. Implications for practice as well as areas for future research

are also presented.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter presents conclusion and recommendations based upon the data

analyses performed and presented in Chapter 4. Because it is a mixed--method study; this

will include integrating the findings from both the qualitative and quantitative portions of

the study. Where apparent conflicts exist in these findings, potential explanations are

explored. From this, implications for future research are drawn. This chapter is divided

into five sections: overview, interpretations and discussion of findings, conclusions and

implications, limitations and future research, and closing remarks.

Overview

"The miracle isn't that they finish, but that they have the courage to start"

(Bingham, 1999, p. 184). I read these words years ago, soon after my first marathon, and

through this study I have gleaned how truly accurate they are. Given the multitude of

stories of transformation as a result of a person completing a marathon, this study

ventured to quantify that change. It also sought to clarify these transformations in terms

of what the participants learned about themselves.

The research questions this study sought to answer were:

1.  What change in self-efficacy do individuals realize by virtue of training for

    and completing a marathon, as measured by Sherer's (1982) General Self-

    Efficacy (GSE) instrument?

2.  What change in goal orientation do individuals realize by virtue of training for

    and completing a marathon, as measured by Button, Mathieu, and Zajac's

    (1996) Goal Orientation instrument?

3. What is the relationship between the change in self-efficacy and the change in goal orientation?

4. What is the relationship between an individual's reason for taking on the challenge of the marathon and that person's goal orientation?

5. How do first-time marathoners think their perspective has transformed by virtue of training for and completing their first marathon?

This study analyzes these questions through three theoretical perspectives: that of Sherer's (1982) General Self-Efficacy, Button et al.'s (1987) Goal Orientation and Transformative Learning. Transformative learning is derived from Mezirow's (1978) conceptualization of transformative learning as well as from Boyd's (1991) concept of emergent transformative learning. Self-efficacy as originally defined by Bandura (1997) is the belief in oneself to accomplish something. Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982) expanded this to a concept of general self-efficacy.

Goal orientation describes how individuals interact with and react to their environment. With regard to learning orientation, the individual is primarily concerned with mastering the skills necessary to accomplish the task. With regard to performance orientation, the individual focuses on winning (i.e., beating the competition). Dweck's (1986) seminal work conceptualized these as opposite ends of a single dimension. The work of Button et al. (1996) revealed that these were actually two distinct dimensions.

Mezirow first introduced the concept of transformative learning in 1978. For Mezirow (2000), transformation involves a "fundamental reordering of assumptions" (p. 139). He goes on to say transformative learning is learning where a learner "came to a new understanding of something that caused a fundamental reordering of the

paradigmatic assumptions she held about the idea or action concerned" (p. 140). Boyd (1991) expanded the concept of transformative learning to include emergent transformation.

The quantitative analysis in this study was based on surveys completed before and after the marathon. One hundred ninety three people completed the initial survey. This survey was completed within two weeks of the participants' signing up for a marathon. The follow-up survey was completed by 79 participants. Of these, six had not actually completed the marathon, thus leaving 73 complete pairs of data. The only demographic data that was collected was for age. Most of the participants were in their thirties (46%), followed by those in their twenties (30%), those in their forties (18%), with the remaining 6% in their fifties. Data was also analyzed based on the participants' reason for doing the marathon. Participants were given the option of choosing challenge, charity, health, or other as their reason for doing the marathon. Among those completing both the initial survey and the follow-up survey, only two selected charity as their primary reason for completing the marathon. This compared with 73% who indicated challenge was their primary reason. Of the 15% who indicated "other," 53% indicated "life goal" as the reason.

The survey measured general self-efficacy and goal orientation. Nine research hypotheses were tested using the data. None of the research hypotheses could be accepted. Table 33 summarizes the hypotheses and the findings.

Table 33 *Summary of Hypotheses and Findings*

| Hypothesis | Finding |
|---|---|
| $H_1$: By training for and completing their first marathon, individuals will experience a significant increase in self-efficacy, as measured by Sherer's (1982) General Self-efficacy instrument, between the time when they begin training for the marathon and 14–21 days after completing the marathon. | Changes in self-efficacy scores were insignificant. Although insignificant, the scores did show a slight increase. |
| $H_{1a}$: Individuals with an initial high score on the self-efficacy scale and a high performance orientation will experience significantly less change in self-efficacy than those with either an initial low self-efficacy score or a low performance orientation. | No correlation was found between change in self-efficacy and initial scores. |
| $H_{1b}$: Individuals with a high initial learning orientation will experience a significantly greater increase in self-efficacy than those with a low initial learning orientation. | No correlation was found between change in self-efficacy and initial scores. |

| Hypothesis | Finding |
|---|---|
| $H_2$: By training for and completing their first marathon, individuals will experience a significant increase in learning orientation, as measured by Button et al.'s (1996) Goal Orientation instrument. | Changes in goal orientation scores were insignificant. Although insignificant, the scores did show a slight increase. |
| $H_{2a}$: Individuals with slower completion times will show significantly higher learning orientations than those with faster completion times. | No correlation was found between completion time and learning orientation. |
| $H_{2b}$: Individuals with faster completion times will show significantly higher performance orientations than those with lower completion times. | No correlation was found between completion time and performance orientation. |
| $H_{2c}$: Older individuals will show significantly higher learning orientations than younger individuals. | No correlation was found between age and learning orientation. |
| H3a: Those with a low desire for a specific completion time will show a significantly higher learning orientation than those with a high desire for a specific completion time. | No correlation was found between desire to complete within a specific time and learning orientation. |

| Hypothesis | Finding |
|---|---|
| H3b: Those with a high desire for a specific completion time will show a significantly higher performing orientation than those with a low desire for a specific completion time. | No correlation was found between desire to complete within a specific time and performing orientation. |

The quantitative results revealed a statistically insignificant change in both general self-efficacy and goal orientation. Both general self-efficacy and learning orientation showed slight increases, while performing orientation showed a slight decrease. The participants' primary reason for doing the marathon, their age, their speed, and how much importance they placed on completing within a specific time goal did not influence any of the statistical analyses.

The qualitative portion of this study sought to understand the nature of the change the participants sensed they had experienced. This was done through short-answer questions posed to all the participants who completed the follow-up survey and focused interviews conducted with a deliberate sampling of the finishers. Participants were selected for the interviews to ensure that participants at all extremes of goal orientation were included. Participants were categorized as low, mid, and high, based on a tertiary split of the goal orientation scores. They were given this rating for both learning and performing orientation. From these scores, participants were selected who rated high on both scales, low on both scales, or high on one scale and low on the other. Additionally,

selection was done to ensure that each of the possible primary reasons for doing the marathon was represented.

The qualitative findings from the follow-up telephone interviews supported the notion that the participants believed they had changed. Consistently, they spoke of having confidence to take on any challenge now that they had completed the marathon. They felt that, through planning (i.e., setting intermediate goals to achieve the final goal), all tasks were manageable. The next section articulates the interpretation of the findings. It starts with the quantitative findings, followed by the qualitative findings, and finishes with a synthesis of the two.

<center>Interpretations and Discussion of Findings</center>

The first research question sought to quantify the change in general self-efficacy experienced by first-time marathoners, as measured by Sherer's (1982) General Self-Efficacy instrument. Hypothesis $H_1$ addressed this question. The results of the paired sample t-test indicate the increase in self-efficacy is not significant at the .05 level, indicating we should not reject the null hypothesis. Although the increase observed is not significant at the .05 level, it is significant at the .14 level. Additionally, this group had higher general self-efficacy scores than did those in Sherer's (1982) original work, yet lower than the weighted mean calculated for several studies (Table 34).

Table 34 - *Summary - test sample compared to other samples*

| Measure | Original Work | Multiple Works |
|---|---|---|
| General Self-efficacy | Higher | Lower |
| Learning Goal Orientation | Higher | Higher |
| Performing Goal Orientation | Higher | Higher |

Table 35 summarizes the increases in general self-efficacy score versus general self-efficacy level. Participants were classified as low, mid, and high, based on a tertiary split of the pre-survey data. This chart indicates that those in the low and mid groups had increases in general self-efficacy, while those in the high group actually had decreases. Further research would be needed to determine if this is the result of the "ceiling effect." That is, because they are already so close to the top of the scales at the time of the pre-survey, statistically there is little room for measurable improvement. Although conclusions cannot be drawn, it is interesting to note that, by excluding the top 15% of the scores and recalculating the paired t-test the change in general, self-efficacy does reach a level of significance (.006).

Table 35 – *Increase by GSE level*

| Initial GSE Level | GSE | LGO | PGO |
|---|---|---|---|
| Low | 6.3 | .282 | -.144 |
| Mid | .44 | -.026 | -.035 |
| High | -2.73 | -.137 | .049 |

The short-answer portion of the follow-up surveys indicates that 74% of the participants felt they had changed. Those who indicated they had not changed indicated they had undertaken previous challenges that were considerably more challenging than the marathon. Additionally, 67% of the participants felt these changes would carry over to how they would approach future tasks. During the interviews, many of the participants expressed an increase in self-confidence (i.e., a feeling that now they were capable of taking on any challenge). The future challenges they discussed tackling included additional physical challenges as well as career and educational challenges.

The second research question sought to quantify the change in goal orientation (learning and performing) experienced by first-time marathoners, as measured by Button et al.'s (1996) Goal Orientation instrument. Hypothesis $H_2$ focused this question towards changes in learning orientation. The results of the paired sample t-test (Table 33) indicate the change in goal orientations—both learning and performing—scores was not significant at the .05 level, indicating we should reject the null hypothesis. This group had higher learning goal orientation scores and performing goal orientation scores than did those from Button et al.'s (1996) original work, as well as higher scores than the weighted mean calculated for several studies (Table 34). All of these comparisons were statistically significant, except the performing goal orientation scores compared with Button et al.'s (1996) early work.

Table 35 summarizes the mean of the change in goal orientation scores versus goal orientation level. Participants were classified as low, mid, and high, based on a tertiary split of the pre-survey data. For learning orientation, those in the low and mid groups had increases in general self-efficacy, while those in the high group actually had

decreases. Further research would be needed to determine if this is the result of the "ceiling effect." Although conclusions cannot be drawn, it is interesting to note that by excluding the top 15% of the scores and recalculating the paired t-test, the change in learning orientation reaches a significance level of .071. Performing orientation does not show the same pattern; rather it shows a decrease in scores (although insignificant).

The short-answer portion of the follow-up surveys indicates that, with respect to future tasks, participants changed their goal setting and planning tactics. This can be understood as two aspects: (a) those that tended to look only at the big picture now looking at the steps to get there; and (b) those who focused on the steps now think in terms of the big picture. The mastering of the steps along the way became more evident to the participants as the key to success. Participants also expressed that they were more forgiving of themselves, indicating they had discovered that failure is an opportunity to learn, not a reason to give up. The interviews support these same notions.

Table 36 - *Pre-marathon correlations*

**Correlations**

|  |  | AGE | DAYS | TIME | TIMEDRIV | G1 | L1 | P1 |
|---|---|---|---|---|---|---|---|---|
| AGE | Pearson Correlation | 1 | -.069 | .187 | .050 | .034 | -.016 | -.152 |
|  | Sig. (2-tailed) | . | .564 | .113 | .677 | .775 | .892 | .199 |
|  | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| DAYS | Pearson Correlation | -.069 | 1 | .028 | .090 | .191 | .314** | .187 |
|  | Sig. (2-tailed) | .564 | . | .815 | .453 | .105 | .007 | .113 |
|  | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| TIME | Pearson Correlation | .187 | .028 | 1 | -.218 | -.002 | .150 | .126 |
|  | Sig. (2-tailed) | .113 | .815 | . | .066 | .985 | .205 | .288 |
|  | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| TIMEDRIV | Pearson Correlation | .050 | .090 | -.218 | 1 | .026 | .018 | .020 |
|  | Sig. (2-tailed) | .677 | .453 | .066 | . | .826 | .879 | .871 |
|  | N | 72 | 72 | 72 | 72 | 72 | 72 | 72 |
| G1 | Pearson Correlation | .034 | .191 | -.002 | .026 | 1 | .604** | -.280* |
|  | Sig. (2-tailed) | .775 | .105 | .985 | .826 | . | .000 | .017 |
|  | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| L1 | Pearson Correlation | -.016 | .314** | .150 | .018 | .604** | 1 | -.060 |
|  | Sig. (2-tailed) | .892 | .007 | .205 | .879 | .000 | . | .614 |
|  | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |
| P1 | Pearson Correlation | -.152 | .187 | .126 | .020 | -.280* | -.060 | 1 |
|  | Sig. (2-tailed) | .199 | .113 | .288 | .871 | .017 | .614 | . |
|  | N | 73 | 73 | 73 | 72 | 73 | 73 | 73 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The third research question sought to discover the factors that lead to the levels of general self-efficacy and goal orientation. Table 36 indicates that the only items that correlate are initial general self-efficacy and initial learning orientation (positively at the .01 level), and initial general self-efficacy and initial performing orientation (negatively at the .05 level). Although no hypothesis was conjectured, it is interesting to note a positive correlation (at the .01 level) between general self-efficacy and days prior to the marathon that a participant registered for the marathon.

Table 37 - *ANOVA Significance Summary*

| Scale | Reason | GSE | LGO | GSE |
|-------|--------|------|------|------|
| GSE Increase | .724 | .000 | .013 | .838 |
| LGO Increase | .123 | .047 | .001 | .094 |
| PGO Increase | .668 | .556 | .196 | .048 |

The ANOVAs (Table 37) indicate a relationship between initial general self-efficacy and change in learning goal orientation (sig. = .047), as well as change in general self-efficacy (sig. < .01). A relationship also appears to exist between initial learning orientation and change in learning orientation (sig. < .01) and change in general self-efficacy (sig. = .013). The interesting element in these relationships is that they are the reverse of what was anticipated. $H_{1B}$ hypothesized that the higher a person's initial learning goal orientation scores, the more increase that person would have in general self-efficacy. Although not hypothesized, similar conjectures could have been made about the other three relationships (i.e., initial high learning orientation scores would have been expect to lead to greater increases in learning orientation scores; similarly, initial high general self-efficacy scores would have been expected to lead to greater increases in both general self-efficacy score and learning goal orientation score). In all four cases, significant decreases were seen. There is insufficient research to determine if we are simply seeing the "ceiling effect."

Table 38 - *MANOVA Significance Summary for Change in GSE*

|  | PGO | LGO | GSE |
|---|---|---|---|
|  | .244 | .871 | .017 |
| PGO |  | .415 | .266 |
| LGO |  |  | .533 |

The MANOVA (Table 38) indicates there are no changes to the general self-efficacy scores that are the result of the interaction between any or all of the initial three measures. Here again, the issue may simply be that the participants in this study started with scores significantly higher than those in other studies.

$H_{2A}$ hypothesized that those participants who had slower completion times would show higher initial learning goal orientation scores, whereas $H_{2B}$ hypothesized that those with faster completion times would show higher initial performing goal orientation. In both cases, no relationship was found. $H_{2C}$ hypothesized that older participants would show higher initial learning goal orientations. Here again, no significance differences were found.

The fourth research question sought to explore the relationship between the participants' primary reason for entering the marathon and their goal orientation. Participants were given four options as their primary reason for partaking in the marathon: challenge, charity, health, and other. Seventy-three percent indicated "challenge" as their primary reason for running a marathon. Of the 15% who indicated "other," more than half indicated completing the marathon was a "life goal." Given this imbalance, it is not surprising that no statistical difference was seen for goal orientation

scores based on reason. To test this further, hypothesis $H_{3A}$ and $H_{3B}$ investigated the

significance of completion time on goal orientation scores. All participants were asked to

rate on a scale of 1 to 10 how important it was that they complete the marathon within

their anticipated completion time. $H_{3A}$ hypothesized that those who placed less

importance on meeting their completion time would show higher learning goal

orientation scores, whereas $H_{3B}$ hypothesized that those who placed a greater emphasis on

meeting their completion time would show higher performance goal orientation scores.

As Table 36 shows, there was no correlation between the person's drive to meet a

specific completion time and either goal orientation measure.

Research question five sought to understand if and how the participants felt their

perspective had been transformed. Seventy-four percent of the participants indicated they

felt they had changed as a result of training for and completing the marathon; of these

58% of the participants felt their confidence in their ability to take on additional

challenges had increased. Sixty-nine percent of the respondents anticipated they would

approach tasks differently in the future. Of these, 28% gave answers indicating they

would approach new tasks with more confidence, well 37% indicated their strategy for

setting goals would change.

Emergent transformative learning differs from epochal transformation in that

there is no disorienting dilemma. As Boyd (1991) indicates, it is when reflecting back

that people realizes they are no longer who they were. For many, this comes in the form

of individuation. Boyd (1991) describes individuation as one's discovery of new talents, a

new sense of confidence and empowerment, and a deeper understanding of one's self.

The emergent transformative learnings were significantly more general. From an

emergent perspective, participants spoke of reflecting back to who they were before they started training for the marathon and who they are now. These learnings fell into two primary categories: (a) expressions of being more confident, and (b) changes towards goal setting. Confidence was expressed through the belief that no challenge seemed too daunting to take on now that they had completed the marathon. Goal setting was seen from a number of perspectives; there were those who had only looked at the end goal before and now saw the benefit of setting out a plan with intermediate goals, and there were those who had only focused on the near-term goal in the past and now saw the benefit of being aware of the ultimate goal. It is this combination of short-term intermediate goals and long-term overall goals that gave them the confidence that any goal is achievable (given a good plan).

Another theme that emerged was the willingness of the participants to accept failure as a learning opportunity. "Failure" is actually too harsh of a word to use here. This phase (failure) was too harsh primarily for participants who did not reach their time goal. They had successfully completed the event, just not as they had hoped. They realized this was an accomplishment to be proud of, and they were. However, they also realized they could learn from this experience to attempt to achieve the time goal in a subsequent marathon. In coming to this realization, they realized this was true of all challenges that they face. Primarily, they realized that, when they attempt something new, they do not have to be perfect the first time. By accepting that perfection is not a criterion for determining if a new challenge should even be accepted, they have opened the door to trying many more opportunities.

This leads to the question: why do the measures from the quantitative portion of this study not support the perception the participants have that they have changed? The pre-survey measures were taken after the participants had already registered for the marathon (i.e., they had already made the commitment to complete the marathon). It was assumed at the outset of this study that the start of training and registration would happen at approximately the same time. In reality, most of the participants were well into their training at the time they signed up for the marathon. Consequently, they had already reached a point of believing they would effectively complete the marathon. For some, this was just a few weeks before the marathon; for others, it was several months. The data supports a positive correlation between how far in advance participants signed up for the marathon and their general self-efficacy scores.

Academic studies (Betz & Hackett, 1981; DiClemente et al., 1985; Lane & Lane, 2001; Schunk, 1983; Schunk, 1991; Sherer et al., 1982; Vrugt et al., 2002; Weinberg et al., 1980; Wood & Locke, 1987; Wurtele, 1986) address the various ways that an individual's self-efficacy increases by successfully achieving a challenging event. Other academic studies (Halpern-Felsher, Kropp, Boyer, Tschann, & Ellen, 2004; Kanungo, 1998; Latham, Winters, & Locke, 1994; Paglis & Green, 2002; Tracey, Hinkin, Tannenbaum, & Mathieu, 2001; Vannatta & Fordham, 2004; Wiener et al., 1999) that seek to define a causal relationship between commitment and self-efficacy do so from the perspective that higher initial self-efficacy leads to greater commitment to completing the task.

In this study, we can be certain that nearly 70% (i.e., 72 completions out of 104 possible completions) of those who made the commitment (registered) for the marathon

actually completed it. There is no way of knowing if the participants who did not complete the follow-up survey did or did not complete the marathon; all that is known for certain is that they did not complete the follow-up survey. In fact, the percentage of participants who followed through and completed the marathon may actually be higher. Therefore, it can be concluded that, by the time people make the public commitment (registration) to taking on a new challenge, their self-efficacy has already increased to the point that they will more than likely carry it through to completion. In a prior study (Carson, 2004), participants consistently expressed the sentiment that "If you had asked me a year ago, I would have adamantly told you 'no way.'" This leaves open the question - what changed within these individuals to make them consider the marathon and subsequently go on to registering for it.

Merriam Webster defines "commitment" as an agreement or pledge to do something in the future, "motivation" as the act of being motivated, "motivate" as to provide with a motive, and "motive" as something that causes a person to act. Using these definitions, through registration, the person has made the commitment to the future act of running the marathon. The question becomes: what gives them the motivation to carry through with it? Everyone who signed up for the marathon had made the commitment to doing the marathon, yet not everyone had the motivation to complete it. In this study, we cannot conclude whether the participants who signed up had particularly high self-efficacy: compared with Sherer's (1982) original work, they were higher; but compared with the weighted mean calculated for multiple studies (Table 34), they were lower. There were six participants who completed the follow-up survey in spite of not having completed the marathon, and another six who wrote to inform me they would not

be doing the marathon. Although this is a small group from which to draw conclusions, their initial self-efficacy scores had the same pattern, as did the entire group studied. Self-efficacy scores were not obtained for individuals who did not sign up for a marathon. Therefore, no conclusions can be drawn about the relationship between self-efficacy and making the commitment to undertake the marathon. However, we can conclude that once participants make this commitment, they will likely have the motivation to follow through.

McClelland (1953), in his studies of motivation, determined that achievement motivation is the primary determinant of achievement. This need is said to be an indicator of aspiration to a standard of excellence in achievement situations. It is a psychological factor that dictates the need to excel in situations that have predetermined standards of excellence. It is a desire to do well because of the personal satisfaction derived from it, not the social recognition. In a prior study (Carson, 2004), participants expressed the need to get the medal. Running the distance of the marathon was not adequate to feel that they had been successful; they needed the public recognition of receiving the medal. Although the need to receive the medal could be construed as a need for social recognition, it could also be construed as feedback. The medal signifies that they had completed what they set out to do. As McClelland indicates, most individuals possess a combination of three types of motivation (i.e., achievement motivation, authority/power motivation, and affiliation motivation). Although the strongest motivation seen amongst the participants appears to be achievement motivation, there are also aspects of the other two. Further research would be needed to understand what motivates some individuals to complete the marathon, while others do not.

The increase in self-efficacy between the time the commitment (registration) is made and the actual completion of the event is not statistically significant. The completion of the event simply becomes a validation of what participants already believed to be true. This is in direct contradiction to the current understanding that, by completing an event, self-efficacy will increase. However, other studies have not looked at tasks using this longitudinal perspective. To understand when, or even if, significant increases in self-efficacy are experienced, more longitudinal studies need to be performed. Data was not collected for participants who did not complete the event; therefore, no conclusions can be drawn about the changes in self-efficacy for those individuals.

In summary, the interviews contributed significant insight into understanding the relationship between commitment and self-efficacy. Without these interviews, the conclusion would have been that, statistically speaking, the completion of a task as daunting as a marathon has no affect on participants' general self-efficacy or goal orientation. Yet it is clear from the interviews that the participants are convinced they have been transformed.

## Conclusions and Implications

The previous section reviewed and interpreted the key findings of this study and offered some possible explanations. This section synthesizes the quantitative and the qualitative segments of this study, draws conclusions, and identifies their implications. Although none of the hypotheses were accepted, the results that were observed are infinitely more interesting. The key conclusions of this study are:

*1)   Changes in self-efficacy between the time of commitment and completion of a new*

*task are minimal.*

In Phase 1, the pre- and post-survey indicate a minimal increase in general self-efficacy; however, the increase is not statistically significant at the .05 level. However, the short-answer follow-up and the interviews indicate that participants now believe they are capable of being effective in taking on any challenge. For the short-answer survey and the interviews, participants reflected back to the time before they had considered participating in a marathon. The pre-survey was completed after the participants had registered for the marathon. Therefore, the empirical data covers the period from when they made the commitment until they accomplished the goal. This implies that the increase in self-efficacy comes prior to the commitment, and the completion of the task is simply the validation of what is already known.

The implication of this is that people do not have to actually complete a new task to experience an increase in self-efficacy; rather, they need to believe they have the tools and support to complete the task to experience the increase in self-efficacy. This ties in with Bandura's (1977, 1982, 1996) four sources that influence self-efficacy: performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Although performing the task brings about a sense of accomplishment, it is apparent that the other three sources played a larger role in influencing the self-efficacy of the participants. Through vicarious experience, they came to believe they, too, could take on the challenge of the marathon. This is stated so eloquently by one participant who said, "If Fred (not actual name) can do it, so can I. He drinks and smokes and he's practically

blind, so he's running into people. After running for awhile, I realized, 'Yeah, he does all this, but he's running better than I.'"

Through coaching from others, they were verbally persuaded that they could accomplish the marathon. Finally, through the physical training, their physiological state improved to bring about an addictive nature to training for the marathon. This study focused on the non-physical changes experienced; therefore, little information was gathered in terms of physiological changes. In spite of this, participants did mention this addictive quality. Some of these sentiments were expressed as, "Because I have a very addictive personality, I figured I substitute one addition for the other addiction." "Yeah, I'm somewhat obsessive," and "It's like I need this." The combination of these three influences raised the participants' self-efficacy to the point that they were willing to commit to the marathon by registering for it. Once registered, it was simply a matter of going through all the steps until the ultimate goal of the marathon was achieved.

In the context of this study, the marathon is thought of as a metaphor for any major challenge a person undertakes. This implies that, for people to be successful, they need only be given the tools to know they can succeed. This can be done through vicarious experience, verbal persuasion, or potentially physiological aspects. From the perspective of the work environment, this means that training and coaching should be done to give employees the tools to know they can be successful.

In terms of vicarious experiences and verbal persuasion, this can be achieved through mentoring, coaching, and team teaching. Additionally, within the marathon training, we see a gradual approach to success. Each week, participants are given a new goal (distance or time) to achieve. By achieving these small goals, they are ultimately

able to achieve the final vision of being able to complete the marathon. This same technique can be applied to training in any setting. The ultimate goal needs to be defined so that employees know where they are heading, but they need the intermediate feedback to know they are on the right course. Once they assimilate these new tools into their general knowledge, they are able to carry out the remainder of the steps to complete the task.

*2)  Planning is important to increased self-efficacy.*

Neither the ability to plan out the short-terms goals to achieve a major goal nor the ability to see the long-term goal takes precedence. It is the ability to combine the two that makes achieving major goals possible. As many of the participants indicated, it is the ability to set the steps to meet the intermediate goals, while keeping one's eye on the ultimate goal, that makes all things possible. Because of this new philosophy no tasks appears too daunting.

An implication of this study is the importance of planning and pacing in goal setting and its impact on self-efficacy. A common theme among all the interviews was the importance of planning and setting a pace to accomplish monumental goals. For some of the participants, this was already the method they used to accomplish major goals; for others, it was seeing the effect of this method in training for and accomplishing the marathon that changed their approach to new challenges. Consistently, participants agreed that it is being able to take a major goal and determine the intermediate steps to accomplishing it that makes the major goal doable. Yet, at the same time, they agree that one must be able to see what the overall goal is to stay motivated and go through all the

steps necessary to get there. Neither the long-term nor the short-term goal takes precedence; it is the combination of the two that makes the ultimate goal achievable.

Participants described pacing as setting intermediate goals so that each one represents a steady increase from the previous one. However, they also described the need to be flexible in achieving the intermediate goals. That is, if something happens that prevents the accomplishment of an intermediate goal, it is necessary to re-plan in order to get back on track. Again, this ties in with not losing focus on the ultimate goal.

From the perspective of the work environment, this implies that it is not adequate for the leadership to simply have a vision, without a path to achieve it. It also means that only keeping employees informed about the short--term goals is not adequate. What is needed to keep the workforce energized to complete the short-term goals is a clear picture of the long-term objective. And what is needed to energize them so that they believe that a long-term goal is achievable is a clear plan showing how they are to get there.

A critical element of this planning is that the intermediate goals have to be such that they are achievable by the employee. However, they must be challenging. If goals are set too high they will not be attempted, if they are set too low the employee will not be challenged. Finding this delicate balance between too high and too low is an ongoing issue.

Using the metaphor of the marathon this is handled through making multiple training plans available to the potential marathoner. There are plans where the coach is involved on a regular basis and others where there is no coach. There are plans that map every day of every week, and there are plans that only identify milestones. There are plans that encourage group activities and plans that support individual effort. There are

plans that incorporate daily feedback and plans that only give feedback occasionally. The runner ultimately is responsible to determine what methods works best.

To transfer these concepts to the workplace, an environment needs to be created where the employee can express what works best for them. Employees should be involved in the creating their annual performance plans. These performance plans need to be clearly tied to the corporate vision. Performance plans should to go beyond the typical process where performance plans are created at the beginning of the year and then put away until the end of the year. The performance plan needs to include a review cycle, and what that cycle is should be determined between the employee and the manager. A key element that needs to be incorporated into the review cycle is the anticipation that the performance plan may need to be modified. The performance plan must be viewed as a living document that keeps a focus on the corporate vision.

*3) Decreasing performance orientation is important to increased self-efficacy.*

Another common theme was the ability to accept that perfection was not mandatory. New tasks could be tried without knowing whether success was guaranteed. These participants realized that not achieving the first time out did not indicate a failure, but rather presented a learning opportunity. Bandura (1977) identifies this as a trait of individuals with high self-efficacy. These individuals take failure as a learning opportunity, not as an excuse to give up. Although the decrease in performing orientation was not statistically significant, there was a decrease.

This implies that, by lowering an individual's performing orientation, it is possible to increase self-efficacy. Within the work environment, this implies creating a culture in which employees are not expected to be perfect at all times; an environment in

which learning is encouraged. Performing expectations should not be discarded completely, but softened to allow for the opportunity to learn.

In Bandura's (1977) social learning theory the importance of modeling is emphasized. Within the work place employees can learn simply by observing other people. During observation, their ability to perform the task is not tested. Through these observations, they need to pay attention, remember, replicate, and be motivated to demonstrate what they have learned. For organizational training to be most effective, it is necessary for the employee to feel they do not have to replicate the behavior perfectly the first time. By creating an environment where it acceptable to learn from one's mistakes, the organization can create an environment that will be more conducive to raising the employees' self-efficacy. By raising the employee's self-efficacy, the organization will create a workforce that is willing to expand their potential.

Feedback is critical to this learning cycle. Feedback for not being perfect needs to be clear and positive. Feedback needs to be done in a positive manner to encourage additional attempts at the new behavior. When an employee knows they will not be belittled or demeaned as a result of failure during learning a new task, he or she will be more willing to put out additional effort in future attempts at the behavior.

Using the metaphor of the marathon – during training – if a runner had trouble with a particular run, the coach and other runners would talk her through it. They would discuss what had led to the problems of this particular run, bring this runner to a place that they were even more determined to successfully complete the next training run. The coach consistently supplies positive feedback in order to raise the self-efficacy of the runner.

This same behavior can be seen in Action Learning. The coach creates an environment where it is safe to ask questions. This creates an environment where it is not necessary to have all the answers – rather it is encouraged to demonstrate where you do not have knowledge so others can help in your learning. The coach models the desired behavior by only asking questions. These questions are always phrased in a positive, supportive manner. The coach uses single-loop, double-loop, and triple-loop learning questions. By modeling this behavior of asking positive questions and asking probing questions, the team members learn the power of this behavior and subsequently start demonstrating it themselves. As the team members learn the power of this new behavior they have been demonstrating, they begin to integrate questions and learning into their daily activities.

*4) Emergent transformative learning is general.*

The emergent transformations general in nature. It is in the deep reflection about "who I am now" versus "who I was then" that the participants realized they are not the people they were when they first set out on this endeavor. It is through this deeper reflection that they realized that they are much more capable individuals, and that challenges they considered beyond their reach were attainable through determination and planning.

Mezirow(1995) indicates that a disorienting dilemma is needed for transformative learning to take place; Boyd (1991) opines this is not the case. Boyd (1991) indicates that transformation can take place over time, and that it is simply through reflection that individuals realize they have changed. This raises many questions:

- If a person does not recall the event, does this automatically classify the transformation by Boyd's (1991) definition?

- How disorienting does the event need to be to be considered a disorienting dilemma?

- Can disorienting dilemmas be positive?

- Both Boyd (1991) and Mezirow (1978) speak of the need for reflection for the transformation to take place, but how much reflection is enough to consider the change transformational?

- How much change is needed for the change a person experiences to be considered transformational? Is it enough for people to realize they will never be who they were before?

The participants spoke of the task related learnings and emergent transformative learnings experienced with equal enthusiasm. When they realized they had transformed from being outside the group to being full-fledged members of the running community, it was a turning point for each of them. It was at this juncture that they knew they were going to be able to complete the task. The actual completion of the task (marathon) led them to reflect on the implications of what they had accomplished in broader terms. It was through these reflections that they were able to see the applicability of their new learning orientation to other goals.

From the perspective of the work environment, this would imply that it is important to get employees to the juncture of knowing they now have the skills to complete the task on their own. An additional implication is the need for critical reflection; employees need to learn to reflect more deeply than the task at hand and

extend their learnings to future endeavors. These reflections need to go beyond single-loop (i.e., knowing what to do) and double-loop (i.e., learning what to do) learning (Argyris & Schon, 1974) to the level of triple-loop learning (i.e., learning how to learn). This process of teaching employees to critically reflect can be as simple as saving the last 15 minutes of each training sessions to reflect on the activities in these sessions. Two or three questions, from the instructor, designed to cause the participants to reflect on the events of the session are needed. These questions need to be designed to cause critical reflection to take place. For example, rather than asking participants what they have learned today, the question should be "What have you learned about yourself today?" It is more important to give the participants alone time to think about these answers, rather than eliciting verbal responses in the larger group.

This study has contributed to both the self-efficacy literature and the transformative learning literature. In terms of self-efficacy theory, it has concluded that the true change in self-efficacy occurs before a person makes the commitment to taking on a new challenge; the actual completion of the task is simply a validation. In addition, in terms of self-efficacy, it has concluded that planning–both in terms of intermediate goals and keeping cognizant of the ultimate goal–increases self-efficacy. Finally, in terms of self-efficacy, increased self-efficacy inversely correlates with decreased performance goal orientation.

In terms of transformative learning, this study confirms the concept of emergent transformative learning. The nature of the emergent transformation was not related to the task at hand. However, it was somewhat tied to the change in self-efficacy and goal

orientation. Most important, the transformation was associated with the journal, not with the ultimate completion of the task.

## Limitations and Implications for Further Research

This study provides new insights into self-efficacy and transformative learning. However, like all research, this study has limitations that restrict its generalizability. Future researchers can expand on this research to gain more insights into changing self-efficacy as well as further understanding of the nature of transformative learning. Chapter one outlines the limitations that were understood before the start of the study. This chapter offers some insights into the limitations understood from the post-research perspective and suggestions for future research.

*Statistical Regression*

Statistical regression, also called "regression to the mean," is a potential threat to validity of this study. General Self-Efficacy scores could range from 17 to 85. The mean General Self-Efficacy score for the pre-survey of this sample was 66.46. Learning orientation scores could range from 1 to 7. The mean score for this sample was 5.92. These high pre-survey scores of the participants create the opportunity to experience the "ceiling effect" in this study. That is, because they are already so close to the top of the scales at the time of the pre-survey, statistically there is little room for measurable improvement.

To remove the ceiling effect, a study would need to be designed using a challenge that would attract a wider ranger of scores; for instance, a study that followed students through preparing for and taking college entrance exams.

*Lack of Demographic Data*

This study simply focused on the changes experienced by first-time marathoners. The only demographic data that was collected was for age. This particular demographic did not appear to make a difference. However, other demographics were not collected to determine if there were correlations with other aspects. Demographics could include: gender, race, country of original, region of current residence, educational level, occupation, occupational position, physical challenges, etc.

The inverse of this study would also be interesting. During the interviews, several people mentioned their occupations and educational level. Although data was not collected on this subject, there appeared to be a higher than average number of professionals as well as people with advanced degrees. A study to determine the

characteristics that propel participants to excel in so many aspects of their lives would expand the motivation literature.

*Lack of Comparison Data*

This study focused on those who successfully completed the marathon. It was able to identify that changes in self-efficacy are not as prevalent at the completion of the task as at the time of commitment. A longitudinal study that followed many runners would be able to identify when the changes actually took place and if those changes continued over time.

A second potential study would be to compare the self-efficacy scores of runners who have completed different distances. This study could identify the level of challenge that is required to see a significant increase in self-efficacy. In order to fully understand the relationship between level of challenge and level of self-efficacy, participants would need to be asked to rate how daunting they felt the challenge was. For some runners, completing a 5K is as challenging as a marathon is for others. Correlations between perceived challenge and self-efficacy and goal orientation scores, and actual challenge and these same scores would reveal if the perception of the challenge or the actual challenge played a greater role in changing these scores.

A third study could look at the change in measures for those who completed the challenge, those who made it to the start line but did not complete the distance, and those who dropped out before completing their training. There is insufficient data to draw concrete conclusions, but the scores of the few people who filled out the second survey in spite of not completing the distance do not show a significant change. This would lend

credence to the supposition that making the commitment to take on the challenge is where the true changes happen.

*The Study Population*

The participants of this study started fairly high on the scales for all three measures. Because of this, we cannot say definitively if the patterns that were observed are relative only to those who already have a high self-efficacy. A study that was able to observe participants over a wider range of self-efficacy and goal orientation scores would expand the generalizability of these results.

Additionally, all participants for this study had signed up for their first marathon. Expanding participation to a multitude of extraordinary circumstances would also allow for more generalizability. Studies that not only focus on athletic-endurance events but on other extraordinary challenges would significantly expand the understanding of self-efficacy and goal orientation development.

*Volunteer Nature of all Participants*

All participants in this study did so voluntarily. Participants were given no incentive for joining the study. Again, this raises the question of whether these results are indicative of volunteers or if they are generalizable to all marathoners. A study that included an incentive for joining might bring in a greater variety of participants. Just as many marathons give participants t-shirts for signing up; this incentive could be used to entice participants to join the study.

*Lack of Information about General Self-Efficacy and Goal Orientation Development*

This study focused on first-time marathoners. There is a significant time delay between signing up for and completing a marathon. It was assumed at the beginning of the study that participants would start their training at approximately the same time they signed up for the marathon. This proved to be a misconception. In general, participants signed up when they reached a point in their training that they were fairly confident they would achieve the goal.

A study that followed a group of runners over the course of years and measured the self-efficacy and goal orientation of the participants at regular intervals would reveal what trigger events caused changes in any of these measures. This suggestion for a future study would not need to be limited to runners; students could also be followed over the course of years. In each instance, correlating the change in measures on the three scales for those who go on to the next level versus those who do not would further expand the understanding of the trigger events that cause changes in each of these measures.

Closing Remarks

The transformational experience of the first-time marathoner has long been understood. Stories abound depicting these life-changing transformations. Yet, in the course of this study, it was revealed empirically that this is not the case. Marathoners speak of having more confidence (i.e., ability that they can now be successful at any task). Self-efficacy is simply a measure of how effective people feel they can be in a task. If the marathon was truly responsible for this transformation with respect to people being more able, then the self-efficacy scores of the participants should have increased significantly. The qualitative portion of this study indicates that participants truly believe

they are more capable, leading to the supposition that the change in self-efficacy happens at or before the time of commitment to taking on a new challenge, not at the time of completion. More research is needed to determine when in the process of taking on a new challenge general self-efficacy is truly changed.

Additionally, this research points to a link between goal orientation shifts and shifts in self-efficacy. Although Button et al. (1996) determined that learning and performing goal orientations are two distinct scales, there appears to be some evidence that the combination of increasing learning orientation and decreasing performing orientation contribute to this more positive transformation sensed by first-time marathoners. They find themselves less afraid of taking on new challenges because they are not afraid of failure (lower performing orientation) and consider failures as learning opportunities (higher learning). Just as a longitudinal study would be needed to understand when the changes in self-efficacy took place, it would also be necessary to do a longitudinal study to understand when goal orientation shifted.

The final element that plays into this sense of transformation is a change in how goals are planned for and carried out. Whereas some participants had an initial tendency to focus on the ultimate goal and lose track of the steps, others focused on the steps and lost track of the ultimate goal. The realization that the combination of the two is needed to be successful became a common theme among the participants.

Although none of the hypotheses set forth in this study were accepted, the qualitative findings proved to be infinitely more interesting. In particular, self-efficacy improvement was minimal (not statistically significant) between the time of commitment and the time of completion of the task, yet most participants were adamant that they have

changed. This leads to the conclusion that the changes in self-efficacy took place prior to

making the commitment (registering) to the marathon. The extensive role planning plays

in this new-found confidence is also inspiring; it is not being able to follow the small

steps or to see the big picture that feeds this new sense of ability, but the combination of

the two. This combination of having the vision to see the ultimate goal, as well as the

steps to get there, appears to play a major part in the participants' ability to see the task

through to the end. It is the hope of this researcher that this concept will be expanded to

other arenas; specifically, that leaders of organizations will think in terms of training their

employees to be successful. This would include training that includes the organization's

vision as well as the steps to get there. It would require an environment in which critical

reflection would be encouraged. It would require an environment in which performance

(perfection) was not expected ahead of learning. It would require an environment in

which employees would have the courage to start knowing they would acquire the skills

to ultimately take them to the finish.

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Appendix A - Recruitment Letter

Hello

I am a doctoral student at The George Washington University, embarking on my dissertation research.

The intent of this research is to measure non-physical changes that are experienced by individuals completing their first marathon. These changes focus on how the individual approaches new tasks.

To be part of this study, you must have signed up for (or started training for) a marathon recently (in the last two weeks) or are planning to sign up for a marathon within the next year. Anticipated completion time is NOT a consideration for eligibility to participate in this study.

As part of the study, you will be asked to fill out a questionnaire. This should take less than 30 minutes.

After your marathon date, you will be sent another copy of the questionnaire to complete. This will need to be filled out 2 to 3 weeks after you complete your marathon.

Surveys will be sent to you via email. The first will be sent within a few days of signing up for the study. The second will be sent about two weeks after your marathon date. You will be asked to return the completed surveys via email.

There will be a third optional phase, in addition to the first two phases. This will be a short interview that should last less than 30 minutes. You can choose to participate in just

the first two stages of this study, or all three. If you choose to participate in the follow-up interviews they can be done either in person or by phone.

To signup please go to www.bke-associates.com and select 'research'. If you have any questions feel free to contact me at bea@bke-associates.com or call 410-353-4722.

Please forward this to others (groups or individuals) who are / may be planning their first marathon.

Thanks


Bea Carson

Appendix B – Initial Demographic Information

Name: _____

Email: _____

Age: _____

Marathon: _____

Marathon Date: _____

Anticipated Completion Time: _____

Reason for doing a marathon: (Rank in order of importance (1–4). Enter N/A for those that are not applicable.)

1. _____ Charity

2. _____ Health

3. _____ Challenge

4. Other:

_____

_____

_____

Appendix C – Follow-up Information

| |
|---|
| 1) What was your marathon completion time? |
| |
| 2) Do you feel you have changed as a result of training for and/or completing the marathon? |
| |
| 3) How? |
| |
| 4) Will the marathon experience change how you approach other major tasks? |
| |
| 5) How? |
| |
| 6) On a scale of 1–10 (1 being not at all important, 10 being extremely important). How important was it to achieve your time goal for the marathon **at the time you signed up** for the marathon? |
| |
| 7) On a scale of 1–10 (1 being not at all important, 10 being extremely important). How important was it to achieve your time goal for the marathon **at the time you completed** the marathon? |
| |
| 8) Are you willing to participate in a follow-up interview? |
| |
| 9) Would you like a summary of your results? |
| |
| 10) Would you like a copy of the final report? |
| |

Appendix D - Sherer's General Self-Efficacy Instrument

<u>Instructions:</u> This questionnaire is a series of statements about your personal attitudes and traits. Each statement represents a commonly held belief. Read each statement and decide to what extent it describes you. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the letter that best describes your attitude or feeling. Please be very truthful and describe yourself as you really are, not as you would like to be.

<u>Mark:</u>  A If you **Disagree Strongly** with the statement

B If you **Disagree Moderately** with the statement

C If you **Neither Agree nor Disagree** with the statement

D If you **Agree Moderately** with the statement

E If you **Agree Strongly** with the statement

1. I like to grow house plants.
2. When I make plans, I am certain I can make them work.
3. One of my problems is that I cannot get down to work when I should.
4. If I can't do a job the first time, I keep trying until I can.
5. Heredity plays the major role in determining one's personality.
6. It is difficult for me to make new friends.
7. When I set important goals for myself, I rarely achieve them.
8. I give up on things before completing them.
9. I like to cook.
10. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.
11. I avoid facing difficulties.
12. If something looks too complicated, I will not even bother to try it.
13. There is some good in everybody.

14. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to makes friends with that person.
15. When I have something unpleasant to do, I stick with it until I finish it.
16. When I decide to do something, I go right to work on it.
17. I like science.
18. When trying to learn something new, I soon give up if I am not initially successful.
19. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.
20. When unexpected problems occur, I don't handle them well.
21. If I were an artist, I would like to draw children.
22. I avoid trying to learn new things when they look too difficult to me.
23. Failure just makes me try harder.
24. I do not handle myself well in social gatherings.
25. I very much like to ride horses.
26. I feel insecure about my ability to do things.
27. I am a self-reliant person.
28. I have acquired my friends through my personal abilities at making friends.
29. I give up easily.
30. I do not seem capable of dealing with most problems that come up in my life.

Appendix E - Scoring Instructions for Sherer's General Self-Efficacy Instrument

Scoring instructions: Answers are converted to numbers (A = 1, B = 2, etc.). Items marked **R** are reversed in scoring (A = 5, B = 4, etc.). Items marked **Filler** are not scored. Items marked **GSE** contribute to the General Self-efficacy Subscale. These are summed to produce the General Self-efficacy Subscale score. Items marked **SSE** contribute to the Social Self-efficacy Subscale. These are summed to produce the Social Self-efficacy Subscale score. The General and Social Self-efficacy Subscale scores are not summed to give an overall score.

Instructions: This questionnaire is a series of statements about your personal attitudes and traits. Each statement represents a commonly held belief. Read each statement and decide to what extent it describes you. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the letter that best describes your attitude or feeling. Please be very truthful and describe yourself as you really are, not as you would like to be.

Mark: A If you **Disagree Strongly** with the statement.

B If you **Disagree Moderately** with the statement

C If you **Neither Agree nor Disagree** with the statement

D If you **Agree Moderately** with the statement

E If you **Agree Strongly** with the statement

1. I like to grow house plants. **Filler**
2. When I make plans, I am certain I can make them work. **GSE**
3. One of my problems is that I cannot get down to work when I should. **R GSE**
4. If I can't do a job the first time, I keep trying until I can. **GSE**
5. Heredity plays the major role in determining one's personality. **Filler**
6. It is difficult for me to make new friends. **R SSE**
7. When I set important goals for myself, I rarely achieve them. **R GSE**
8. I give up on things before completing them. **R GSE**
9. I like to cook. **Filler**
10. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me. **SSE**
11. I avoid facing difficulties. **R GSE**
12. If something looks too complicated, I will not even bother to try it. **R GSE**
13. There is some good in everybody. **Filler**
14. If I meet some one interesting who is hard to make friends with, I'll soon stop trying to makes friends with that person. **R SSE**
15. When I have something unpleasant to do, I stick with it until I finish it. **GSE**
16. When I decide to do something, I go right to work on it. **GSE**
17. I like science. **Filler**
18. When trying to learn something new, I soon give up if I am not initially successful. **R GSE**
19. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily. **SSE**
20. When unexpected problems occur, I don't handle them well. **R GSE**
21. If I were an artist, I would to draw children. **Filler**
22. I avoid trying to learn new things when they look too difficult to me. **R GSE**
23. Failure just makes me try harder. **GSE**
24. I do not handle myself well in social gatherings. **R SSE**
25. I very much like to ride horses. **Filler**
26. I feel insecure about my ability to do things. **R GSE**
27. I am a self-reliant person. **GSE**
28. I have acquired my friends through my personal abilities at making friends. **SSE**
29. I give up easily. **R GSE**
30. I do not seem capable of dealing with most problems that come up in my life. **R GSE**

Appendix F – Button, et al. General Goal Orientation Instrument

Instructions: Individuals have different views about how they approach work. Please read each statement below and select the response that reflects how much you agree or disagree with the statement.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Strongly Disagree | Disagree | Sort of Disagree | Neither | Sort of Agree | Agree | Strongly Agree |

1. _____ I prefer to do things that I can do well rather than things that I do poorly. (P1)

2. _____ I'm happiest at work when I perform tasks on which I know that I won't make any errors. (P2)

3. _____ The things I enjoy most are the things I do best. (P3)

4. _____ The opinions others have about how well I can do certain things are important to me. (P4)

5. _____ I feel smart when I do things without making any mistakes. (P5)

6. _____ I like to be fairly confident that I can successfully perform a task before I attempt it. (P6)

7. _____ I like to work on tasks that I have done well on in the past. (P7)

8. _____ I feel smart when I can do something better than most other people. (P8)

9. _____ The opportunity to do challenging work is important to me. (L1)

10. _____ When I fail to complete a difficult task, I plan to try harder the next time I work on it. (L2)

11. _____ I prefer to work on tasks that force me to learn new things. (L3)

12. _____ The opportunity to learn new things is important to me. (L4)

13. _____ I do best when I am working on a fairly difficult task. (L5)

14. _____ I try hard to improve on my past performance. (L6)

15. _____ The opportunity to extend the range of my abilities is important to me. (L7)

16. _____ When I have difficulty solving a problem, I enjoy trying different approaches to see which one will work. (L8)

**Performing Orientation**       **Learning Orientation**
**1** _____                     **9** _____
**2** _____                     **10** _____
**3** _____                     **11** _____
**4** _____                     **12** _____
**5** _____                     **13** _____
**6** _____                     **14** _____
**7** _____                     **15** _____
**8** _____                     **16** _____

**SUM**                          **SUM**
**AVERAGE**                      **AVERAGE**

Adapted from Button et al. (1996).

Appendix G - Phase 2 Interview Protocol

Do you feel you have changed as a result of completing the marathon?

How?

When were you aware you were changing?

Can you point to a specific moment during the training or the marathon when you were aware of this change? Or was it more gradual – something that developed over the course of the training and completing the event?

Do you find you are more incline to break large tasks into smaller steps?

Do you find you are more incline to take on challenges to learn something new?

How have you seen these changes impact how you approach work?

How have you seen these changes impact your life in general?

Appendix H – Online Information Sheer

**Information Sheet**

Transformative learning:

Self-efficacy and Goal orientation - Transformation through Marathoning

IRB# U070404ER

You are invited to take part in a research study. Before you decide to be a part of this study, you need to understand the risks and benefits. This consent form provides information about the research study. A staff member of the research study will be available to answer your questions and provide further explanations. Your decision to take part in the study is voluntary. You are free to choose whether or not you will take part in the study.

As a student in the Department of The School of Education and Human Development of The George Washington University, I am carrying out a research study to find out Perspective Change as Experienced by First Time Marathoners, specifically in terms of changes in self-efficacy and goal-orientation. Self-efficacy is the belief someone has in themselves to accomplish a new task. The investigator (person in charge of this research study) is Bernadette Carson. The research will be conducted via the internet. You will need to respond 2 times during the study. Each of those visits will take about 30 minutes. The total amount of time you will be asked to volunteer for this study is 60 minute over

the course of your marathon training. You will be asked to fill out a survey at the beginning of your marathon training and again after you complete your marathon.

To the best of our knowledge, the things you will be doing have no more risk of harm than you would experience in everyday life. Although we have made every effort to minimize this, you may find some questions we ask you (or some procedures we ask you to do) to be upsetting or stressful. If so, we can tell you about some people who may be able to help you with these feelings. In addition, you will not get any personal benefit from taking part in this study. There are no costs associated with taking part in this study. You will not receive compensation for participating in this study.

Your participation in this research study is voluntary. You may decide not to begin or to stop this study at any time. You will be told of any new information about the research study that may cause you to change your mind about participation.

Your records will be confidential. You will not be identified (e.g., name, social security number) in any reports or publications of this study. The results of this research study will be given to the sponsor (and/or its representatives). Your research records may be provided to the sponsor, the United States Department of Health and Human Services, foreign government agencies (if any and if relevant to the study), and/or authorized representatives of The George Washington University Office of Human Research and/or Committee on Human Research. Except for these entities, research records will be kept confidential unless you authorize their release, or the records are required to be released

by law (i.e., court subpoena). You will not be identified by name in any reports or publications of this study.

If you have questions about the procedures of this research study, please contact Bernadette Carson by telephoning (410-353-4722) during the workday. If you have questions about the informed consent process or any other rights as a research subject, please contact the Assistant Vice President for Health Research, Compliance and Technology Transfer at (202) 994-2995. This is your representative.

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Appendix I - Raw Scores

| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 - 49 | 81 | 328 | -13.32 | 61 | 66 | 5 | 5.25 | 5.00 | -0.25 | 5.88 | 5.50 | -0.38 | L | H | L | Other |
| 30 - 39 | 102 | 362 | -91.58 | 65 | 72 | 7 | 6.50 | 6.13 | -0.38 | 4.75 | 3.88 | -0.88 | H | L | M | Health |
| 20 - 29 | 111 | 268 | -28.00 | 65 | 59 | -6 | 6.00 | 5.63 | -0.38 | 6.63 | 5.88 | -0.75 | M | H | M | Challenge |
| 40 - 49 | 81 | 225 | -24.97 | 77 | 69 | -8 | 6.63 | 6.00 | -0.63 | 5.13 | 4.75 | -0.38 | H | M | H | Challenge |
| 30 - 39 | 81 | 251 | 18.00 | 69 | 72 | 3 | 6.38 | 6.13 | -0.25 | 4.13 | 4.00 | -0.13 | M | L | M | Challenge |
| 40 - 49 | 81 | 303 | -33.00 | 78 | 74 | -4 | 5.88 | 6.13 | 0.25 | 4.63 | 4.75 | 0.13 | L | L | H | Challenge |

| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 - 39 | 137 | 330 | -44.70 | 72 | 76 | 4 | 6.50 | 7.00 | 0.50 | 6.13 | 6.38 | 0.25 | H | H | H | Challenge |
| 30 - 39 | 93 | 432 | 102.00 | 67 | 65 | -2 | 6.25 | 6.63 | 0.38 | 5.13 | 5.50 | 0.38 | M | M | M | Other |
| 30 - 39 | 121 | 350 | -80.00 | 77 | 70 | -7 | 6.63 | 6.00 | -0.63 | 5.63 | 4.88 | - | H | M | H | Health |
| 20 - 29 | 75 | 298 | 17.00 | 47 | 55 | 8 | 4.50 | 5.63 | 1.13 | 6.38 | 6.25 | 0.13 | L | H | L | Challenge |
| 50 - 59 | 88 | 366 | -51.00 | 63 | 63 | 0 | 5.75 | 5.50 | -0.25 | 5.25 | 5.00 | - | L | M | L | Challenge |
| 20 - 29 | 66 | 344 | -44.00 | 73 | 64 | -9 | 5.88 | 5.00 | -0.88 | 5.13 | 6.63 | 1.50 | L | M | H | Health |
| 30 - 39 | 64 | 302 | -32.05 | 72 | 75 | 3 | 6.50 | 7.00 | 0.50 | 5.00 | 4.25 | - | H | M | H | Other |
| 40 - 49 | 80 | 289 | -27.00 | 71 | 69 | -2 | 6.38 | 6.38 | 0.00 | 5.25 | 5.25 | 0.00 | M | M | H | Other |

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| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 - 29 | 107 | 284 | 16.00 | 68 | 67 | -1 | 6.00 | 6.38 | 0.38 | 5.50 | 5.13 | -0.38 | M | M | M | Challenge |
| 20 - 29 | 114 | 221 | -5.57 | 70 | 75 | 5 | 6.50 | 6.38 | -0.13 | 5.13 | 5.25 | 0.13 | H | M | M | Challenge |
| 30 - 39 | 128 | 225 | 0.00 | 68 | 67 | -1 | 7.00 | 7.00 | 0.00 | 5.38 | 5.38 | 0.00 | H | M | M | Challenge |
| 40 - 49 | 57 | 346 | -46.00 | 72 | 72 | 0 | 7.00 | 6.63 | -0.38 | 5.25 | 5.25 | 0.00 | H | M | H | Challenge |
| 20 - 29 | 76 | 325 | -25.00 | 73 | 67 | -6 | 7.00 | 7.00 | 0.00 | 6.50 | 6.13 | -0.38 | H | H | H | Challenge |
| 30 - 39 | 53 | 269 | -7.00 | 80 | 83 | 3 | 6.38 | 6.25 | -0.13 | 6.13 | 5.25 | -0.88 | M | H | H | Challenge |
| 30 - 39 | 58 | 286 | 14.00 | 72 | 66 | -6 | 6.63 | 6.88 | 0.25 | 6.75 | 6.00 | -0.75 | H | H | H | Challenge |
| 30 - 39 | 70 | 340 | -40.00 | 70 | 73 | 3 | 6.13 | 6.00 | -0.13 | 5.88 | 5.75 | -0.13 | M | H | M | Challenge |

| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 - 29 | 69 | 311 | -26.00 | 63 | 65 | 2 | 5.50 | 5.50 | 0.00 | 4.38 | 4.63 | 0.25 | L | L | L | Challenge |
| 30 - 39 | 103 | 270 | -10.00 | 68 | 69 | 1 | 5.38 | 5.25 | -0.13 | 5.38 | 5.25 | -0.13 | L | M | M | Challenge |
| 20 - 29 | 69 | 314 | 16.00 | 60 | 69 | 9 | 5.88 | 6.25 | 0.38 | 5.75 | 5.50 | -0.25 | L | H | L | Challenge |
| 20 - 29 | 48 | 301 | -39.67 | 70 | 47 | -23 | 6.88 | 4.88 | -2.00 | 6.38 | 6.75 | 0.38 | H | H | M | Challenge |
| 30 - 39 | 62 | 263 | -23.00 | 38 | 62 | 24 | 5.50 | 5.63 | 0.13 | 6.25 | 6.50 | 0.25 | L | H | L | Challenge |
| 40 - 49 | 25 | 220 | 5.00 | 70 | 81 | 11 | 4.25 | 5.13 | 0.88 | 4.75 | 6.00 | 1.25 | L | L | M | Challenge |
| 20 - 29 | 81 | 233 | 6.00 | 69 | 76 | 7 | 6.00 | 6.00 | 0.00 | 5.63 | 5.63 | 0.00 | M | M | M | Challenge |
| 30 - 39 | 59 | 398 | -128.00 | 45 | 58 | 13 | 5.00 | 5.25 | 0.25 | 5.13 | 4.88 | -0.25 | L | M | L | Health |
| 20 - 29 | 59 | 271 | -11.00 | 74 | 72 | -2 | 6.25 | 6.13 | -0.13 | 5.75 | 6.38 | 0.63 | M | H | H | Challenge |

| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 - 29 | 44 | 262 | -22.00 | 63 | 66 | 3 | 4.75 | 5.50 | 0.75 | 5.75 | 5.88 | 0.13 | L | H | L | Challenge |
| 30 - 39 | 58 | 327 | 2.80 | 62 | 67 | 5 | 5.75 | 5.38 | -0.38 | 6.50 | 5.88 | -0.63 | L | H | L | Challenge |
| 30 - 39 | 35 | 329 | -44.00 | 79 | 78 | -1 | 6.38 | 6.88 | 0.50 | 4.88 | 5.50 | 0.63 | M | L | H | Challenge |
| 40 - 49 | 35 | 302 | -32.00 | 78 | 85 | 7 | 7.00 | 7.00 | 0.00 | 3.63 | 3.13 | -0.50 | H | L | H | Challenge |
| 30 - 39 | 35 | 274 | -14.13 | 65 | 68 | 3 | 5.38 | 5.75 | 0.38 | 5.25 | 4.25 | -1.00 | L | M | M | Challenge |
| 30 - 39 | 35 | 336 | 96.00 | 76 | 76 | 0 | 6.63 | 6.38 | -0.25 | 5.50 | 5.50 | 0.00 | H | M | H | Health |
| 20 - 29 | 34 | 279 | 20.00 | 60 | 59 | -1 | 5.25 | 4.75 | -0.50 | 4.63 | 5.13 | 0.50 | L | L | L | Challenge |
| 30 - 39 | 34 | 319 | -19.00 | 82 | 77 | -5 | 6.75 | 7.00 | 0.25 | 4.63 | 4.50 | -0.13 | H | L | H | Challenge |

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| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 - 29 | 76 | 288 | -48.00 | 82 | 70 | -12 | 6.00 | 4.75 | -1.25 | 5.00 | 5.13 | 0.13 | M | M | H | Challenge |
| 20 - 29 | 96 | 325 | 35.00 | 73 | 74 | 1 | 6.63 | 6.63 | 0.00 | 5.63 | 6.25 | 0.63 | H | M | H | Challenge |
| 30 - 39 | 47 | 374 | -14.00 | 67 | 60 | -7 | 6.13 | 5.88 | -0.25 | 6.00 | 6.50 | 0.50 | M | H | M | Charity |
| 30 - 39 | 44 | 385 | -55.00 | 64 | 66 | 2 | 6.13 | 6.13 | 0.00 | 6.13 | 5.75 | - | M | H | M | Challenge |
| 30 - 39 | 34 | 278 | 21.40 | 68 | 83 | 15 | 6.13 | 6.38 | 0.25 | 4.50 | 3.50 | 1.00 | M | L | M | Challenge |
| 30 - 39 | 37 | 339 | -19.10 | 62 | 59 | -3 | 5.50 | 5.38 | -0.13 | 5.88 | 5.50 | - | L | H | L | Challenge |
| 50 - 59 | 35 | 405 | -45.00 | 74 | 66 | -8 | 6.13 | 6.00 | -0.13 | 4.75 | 5.25 | 0.50 | M | L | H | Health |
| 40 - 49 | 61 | 330 | -30.00 | 70 | 72 | 2 | 6.75 | 6.50 | -0.25 | 5.38 | 5.13 | 0.25 | H | M | M | Challenge |

| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 - 39 | 12 | 237 | 2.85 | 67 | 68 | 1 | 5.88 | 5.88 | 0.00 | 4.88 | 5.13 | 0.25 | L | L | M | Other |
| 40 - 49 | 11 | 273 | 6.68 | 40 | 41 | 1 | 5.00 | 5.50 | 0.50 | 6.88 | 7.00 | 0.13 | L | H | L | Challenge |
| 30 - 39 | 11 | 322 | -22.00 | 68 | 67 | -1 | 6.50 | 5.88 | -0.63 | 6.13 | 5.63 | -0.50 | H | H | M | Challenge |
| 40 - 49 | 32 | 277 | -37.00 | 64 | 59 | -5 | 4.38 | 6.00 | 1.63 | 6.13 | 6.00 | -0.13 | L | H | M | Other |
| 30 - 39 | 10 | 252 | 18.00 | 64 | 66 | 2 | 4.38 | 5.63 | 1.25 | 3.25 | 5.00 | 1.75 | L | L | M | Challenge |
| 30 - 39 | 16 | 279 | 1.00 | 75 | 70 | -5 | 5.88 | 5.50 | -0.38 | 6.00 | 6.75 | 0.75 | L | H | H | Challenge |
| 40 - 49 | 23 | 285 | 15.00 | 56 | 59 | 3 | 5.63 | 5.86 | 0.23 | 5.00 | 5.38 | 0.38 | L | M | L | Challenge |
| 20 - 29 | 9 | 328 | -12.80 | 62 | 66 | 4 | 6.13 | 5.50 | -0.63 | 5.13 | 4.75 | -0.38 | M | M | L | Other |
| 40 - 49 | 9 | 356 | -26.00 | 74 | 64 | -10 | 6.13 | 6.13 | 0.00 | 4.13 | 4.63 | 0.50 | M | L | H | Challenge |

| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 - 39 | 9 | 312 | -32.00 | 66 | 62 | -4 | 4.50 | 4.63 | 0.13 | 4.63 | 5.38 | 0.75 | L | L | M | Other |
| 30 - 39 | 9 | 317 | -17.00 | 55 | 60 | 5 | 5.50 | 5.75 | 0.25 | 6.00 | 6.00 | 0.00 | L | H | L | Challenge |
| 50 - 59 | 41 | 318 | 12.23 | 62 | 69 | 7 | 5.13 | 5.88 | 0.75 | 6.14 | 6.13 | -0.02 | L | H | L | Challenge |
| 30 - 39 | 20 | 295 | 4.00 | 42 | 51 | 9 | 4.50 | 5.50 | 1.00 | 5.38 | 4.88 | -0.50 | L | M | L | Challenge |
| 20 - 29 | 6 | 294 | 11.00 | 59 | 73 | 14 | 5.63 | 6.50 | 0.88 | 4.50 | 4.38 | -0.13 | L | L | L | Other |
| 30 - 39 | 7 | 304 | -3.92 | 75 | 74 | -1 | 6.38 | 6.25 | -0.13 | 5.00 | 4.00 | -1.00 | M | M | H | Challenge |
| 20 - 29 | 20 | 278 | 22.00 | 73 | 75 | 2 | 6.00 | 5.88 | -0.13 | 5.88 | 6.25 | 0.38 | M | H | H | Charity |
| 20 - 29 | 20 | 330 | -30.00 | 50 | 70 | 20 | 5.88 | 6.25 | 0.38 | 7.00 | 5.88 | -1.13 | L | H | L | Challenge |

| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 - 49 | 6 | 285 | 15.00 | 58 | 66 | 8 | 5.88 | 5.50 | -0.38 | 5.13 | 4.75 | - | L | M | L | Challenge |
| 30 - 39 | 6 | 273 | 27.10 | 65 | 66 | 1 | 6.50 | 6.63 | 0.13 | 4.88 | 4.75 | 0.38 | H | L | M | Other |
| 30 - 39 | 6 | 264 | 6.00 | 66 | 59 | -7 | 5.25 | 5.63 | 0.38 | 4.75 | 5.13 | - | L | L | M | Challenge |
| 20 - 29 | 4 | 349 | -49.00 | 81 | 81 | 0 | 6.63 | 5.75 | -0.88 | 5.13 | 5.25 | 0.13 | H | M | H | Challenge |
| 30 - 39 | 31 | 257 | -17.02 | 69 | 63 | -6 | 6.13 | 6.50 | 0.38 | 4.88 | 4.75 | 0.38 | M | L | M | Challenge |
| 20 - 29 | 24 | 302 | 58.18 | 56 | 56 | 0 | 3.88 | 4.63 | 0.75 | 6.38 | 6.00 | - | L | H | L | Challenge |
| 50 - 59 | 55 | 377 | -47.03 | 67 | 68 | 1 | 6.00 | 5.88 | -0.13 | 5.38 | 4.63 | 0.75 | M | M | M | Health |
| 30 - 39 | 32 | 243 | -10.00 | 69 | 77 | 8 | 6.38 | 5.75 | -0.63 | 2.63 | 2.88 | 0.25 | M | L | M | Challenge |

| Age | Days | Comp Time | Comp Time Delta | G1 | G2 | GD | L1 | L2 | LD | P1 | P2 | PD | LGO | PGO | GSE | Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 - 29 | 6 | 340 | 20.00 | 57 | 73 | 16 | 5.63 | 6.50 | 0.88 | 4.88 | 5.13 | 0.25 | L | L | L | Other |

Appendix J - Cronbach Alpha Raw Data

| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 4 | 4 | 4 | 4 | 2 | 2 | 3 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 |
| 4 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 4 | 4 | 5 | 5 | 4 | 5 | 3 | 2 | 4 | 4 | 5 | 3 | 5 | 5 | 5 | 5 |
| 4 | 4 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 4 | 2 | 5 |
| 4 | 2 | 3 | 2 | 3 | 2 | 4 | 4 | 4 | 2 | 4 | 4 | 2 | 1 | 5 | 2 | 4 |
| 5 | 3 | 4 | 5 | 4 | 3 | 5 | 3 | 5 | 5 | 4 | 5 | 3 | 5 | 5 | 5 | 5 |
| 5 | 2 | 4 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 4 |
| 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 5 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 |
| 4 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | 5 | 4 | 4 | 3 | 5 | 5 | 5 | 5 |
| 4 | 4 | 4 | 5 | 5 | 4 | 5 | 5 | 3 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 4 |
| 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 4 |
| 5 | 1 | 4 | 4 | 3 | 4 | 5 | 3 | 5 | 4 | 4 | 4 | 4 | 2 | 5 | 5 | 5 |
| 5 | 5 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| 2 | 2 | 4 | 4 | 2 | 3 | 4 | 2 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 5 | 4 | 2 | 4 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 3 | 4 |
| 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 5 |
| 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 2 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4 | 4 | 4 | 4 | 4 | 5 | 2 | 3 | 4 | 5 | 5 | 5 | 2 | 4 | 5 | 4 |
| 4 | 2 | 5 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 3 | 5 | 3 | 5 | 5 | 5 | 5 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 5 |
| 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 5 | 4 | 4 |
| 4 | 2 | 4 | 5 | 5 | 4 | 5 | 4 | 2 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 |
| 5 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| 4 | 4 | 4 | 4 | 5 | 3 | 4 | 3 | 4 | 4 | 2 | 3 | 3 | 3 | 4 | 4 | 4 |
| 4 | 5 | 5 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| 4 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 2 | 4 | 3 | 5 | 4 | 4 | 4 | 4 | 5 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 5 | 4 | 5 |
| 4 | 3 | 4 | 5 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 5 | 5 | 5 |
| 3 | 2 | 2 | 4 | 3 | 2 | 4 | 4 | 2 | 4 | 2 | 5 | 3 | 3 | 4 | 4 | 5 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 2 | 4 | 4 | 5 | 4 |
| 5 | 5 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 2 | 4 | 2 | 2 | 4 | 5 | 4 | 5 |
| 5 | 5 | 5 | 4 | 5 | 2 | 4 | 4 | 5 | 4 | 5 | 5 | 4 | 2 | 4 | 5 | 5 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 4 | 2 | 4 | 4 | 2 | 2 | 4 | 2 | 2 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 |
| 3 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 5 |
| 4 | 4 | 4 | 2 | 2 | 4 | 1 | 4 | 5 | 4 | 1 | 4 | 3 | 2 | 5 | 4 | 4 |
| 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 |
| 5 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 |
| 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 5 | 5 | 5 | 3 | 5 | 2 | 5 | 4 | 5 | 1 | 3 | 2 | 1 | 1 | 4 | 1 | 5 |
| 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 5 | 5 | 5 | 5 |
| 1 | 3 | 1 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 2 |
| 5 | 5 | 4 | 4 | 4 | 2 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 4 |
| 3 | 2 | 4 | 4 | 4 | 2 | 4 | 3 | 2 | 5 | 4 | 4 | 3 | 3 | 4 | 4 | 4 |
| 5 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 |
| 4 | 2 | 4 | 5 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 |
| 3 | 1 | 4 | 4 | 3 | 4 | 3 | 3 | 2 | 4 | 5 | 3 | 4 | 5 | 5 | 3 | 5 |

| | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 4 | 5 |
| | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| | 3 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 4 | 5 | 4 | 5 | 5 |
| | 4 | 2 | 4 | 2 | 2 | 4 | 4 | 3 | 2 | 4 | 2 | 2 | 3 | 3 | 4 | 2 | 4 |
| | 4 | 3 | 4 | 4 | 3 | 5 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 2 | 4 | 4 | 4 |
| | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 2 | 4 | 5 | 5 |
| | 4 | 2 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 1 | 5 | 4 | 2 | 4 | 1 | 1 | 3 | 4 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 |
| | 4 | 2 | 3 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 4 |
| | 4 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 5 | 5 |
| | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 5 | 4 |
| | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 3 | 4 | 5 | 5 | 3 | 5 | 5 | 4 | 5 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 |
| | 4 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 5 |

| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 4 | 4 | 1 | 5 | 5 |
| 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 |
| 5 | 4 | 5 | 2 | 4 | 4 | 4 | 3 | 4 | 4 | 2 | 4 | 4 | 5 | 5 | 5 | 5 |
| 4 | 5 | 4 | 5 | 4 | 3 | 4 | 3 | 5 | 4 | 3 | 4 | 1 | 5 | 4 | 5 | 5 |
| 4 | 4 | 4 | 4 | 4 | 1 | 2 | 3 | 4 | 3 | 1 | 4 | 3 | 4 | 5 | 4 | 5 |
| 5 | 2 | 5 | 5 | 4 | 2 | 4 | 3 | 5 | 5 | 4 | 3 | 3 | 5 | 5 | 5 | 5 |
| 4 | 2 | 3 | 4 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 4 | 2 | 2 |
| 4 | 4 | 4 | 5 | 3 | 4 | 4 | 4 | 4 | 3 | 5 | 4 | 4 | 4 | 5 | 4 | 5 |
| 4 | 4 | 4 | 5 | 4 | 4 | 2 | 4 | 4 | 4 | 2 | 2 | 4 | 4 | 5 | 4 | 5 |
| 5 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| 4 | 2 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 3 | 5 | 4 | 4 |
| 4 | 4 | 5 | 2 | 2 | 5 | 5 | 3 | 5 | 2 | 4 | 4 | 4 | 1 | 5 | 4 | 5 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 3 | 4 | 2 | 5 | 4 | 2 | 5 | 4 | 4 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 4 | 4 | 4 | 4 | 2 | 4 | 3 | 2 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 |
| 4 | 2 | 4 | 4 | 4 | 2 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 5 |
| 3 | 2 | 4 | 2 | 2 | 2 | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 2 | 3 | 4 | 4 |
| 3 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 4 | 3 | 3 | 4 | 2 | 2 | 3 | 2 |
| 4 | 2 | 4 | 4 | 2 | 3 | 4 | 4 | 2 | 4 | 4 | 5 | 4 | 2 | 5 | 4 | 4 |
| 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 5 |
| 2 | 3 | 3 | 4 | 4 | 4 | 5 | 2 | 2 | 2 | 4 | 4 | 3 | 2 | 5 | 4 | 5 |
| 5 | 2 | 5 | 5 | 5 | 2 | 4 | 4 | 3 | 3 | 5 | 4 | 3 | 5 | 4 | 5 | 5 |
| 4 | 4 | 3 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 2 | 4 | 3 | 2 | 4 | 4 | 4 |
| 3 | 4 | 3 | 4 | 4 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 3 | 2 | 3 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 3 | 1 | 3 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 5 | 5 |

| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 5 |
| 5 | 5 | 5 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 5 |
| 4 | 4 | 4 | 4 | 4 | 2 | 4 | 2 | 4 | 3 | 4 | 4 | 3 | 5 | 4 | 4 | 4 |
| 4 | 4 | 4 | 5 | 5 | 2 | 4 | 4 | 4 | 4 | 2 | 4 | 2 | 4 | 4 | 4 | 5 |
| 5 | 5 | 4 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 2 | 4 | 4 | 4 | 3 | 2 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 5 | 3 | 5 | 3 | 5 | 4 |
| 5 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 5 | 4 | 4 | 5 | 5 | 2 | 4 | 3 | 4 | 4 | 5 | 5 | 5 | 2 | 5 | 5 | 5 |
| 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 |
| 4 | 5 | 5 | 5 | 5 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 |
| 4 | 3 | 4 | 4 | 4 | 2 | 4 | 4 | 2 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4 | 4 | 5 | 5 | 4 | 4 | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 4 | 3 | 1 | 3 | 2 | 1 |
| 3 | 3 | 5 | 5 | 4 | 3 | 4 | 4 | 5 | 5 | 3 | 4 | 4 | 2 | 4 | 4 | 5 |
| 3 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 5 | 4 | 5 |
| 3 | 5 | 4 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 3 | 5 | 2 | 4 | 4 | 5 | 5 |
| 2 | 2 | 4 | 5 | 5 | 4 | 4 | 3 | 2 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 |
| 4 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 4 | 2 | 2 |
| 5 | 2 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 3 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 5 |
| 4 | 2 | 3 | 4 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 3 | 4 | 4 | 4 | 2 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 4 |
| 4 | 2 | 4 | 5 | 2 | 2 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 5 | 5 |
| 4 | 2 | 4 | 4 | 4 | 4 | 2 | 4 | 2 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 |
| 5 | 3 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 |
| 5 | 4 | 4 | 4 | 4 | 4 | 3 | 5 | 4 | 4 | 4 | 5 | 5 | 2 | 4 | 4 | 5 |
| 5 | 4 | 1 | 5 | 1 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 2 | 5 | 5 | 5 | 5 |
| 4 | 1 | 2 | 4 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 4 | 1 | 4 | 4 | 2 | 4 |
| 4 | 3 | 4 | 4 | 4 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 2 | 5 | 4 | 3 | 4 | 3 | 4 | 4 | 5 |
| 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 5 |
| 5 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 3 | 4 | 5 | 5 |
| 4 | 2 | 4 | 4 | 4 | 2 | 4 | 2 | 2 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 4 | 3 | 4 | 5 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 4 |
| 4 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 3 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 |
| 3 | 4 | 4 | 4 | 3 | 2 | 2 | 4 | 4 | 3 | 4 | 3 | 3 | 2 | 4 | 3 | 4 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 4 | 2 | 4 | 4 | 3 | 3 | 5 | 2 | 2 | 3 | 5 | 4 | 3 | 5 | 5 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 |
| 3 | 2 | 4 | 4 | 5 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | 4 | 5 | 5 | 5 |
| 4 | 3 | 4 | 4 | 4 | 2 | 4 | 3 | 2 | 2 | 4 | 2 | 3 | 2 | 4 | 4 | 4 |
| 4 | 2 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 4 |
| 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 1 | 4 | 5 | 5 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| 4 | 4 | 4 | 5 | 4 | 3 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | 4 | 5 | 4 | 4 |
| 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 4 | 4 | 2 | 2 | 3 | 2 | 3 |
| 4 | 4 | 3 | 4 | 4 | 3 | 2 | 3 | 4 | 2 | 2 | 4 | 3 | 4 | 5 | 4 | 4 |
| 4 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 2 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 5 | 5 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 |
| 4 | 2 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 4 | 3 | 4 | 3 | 3 | 5 | 5 | 5 |
| 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 2 | 4 | 4 | 4 | 5 | 5 | 5 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | 5 | 4 | 5 |
| 4 | 2 | 4 | 4 | 3 | 2 | 2 | 4 | 4 | 1 | 1 | 2 | 3 | 2 | 4 | 4 | 4 |
| 4 | 4 | 3 | 4 | 4 | 2 | 3 | 4 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 4 |
| 4 | 3 | 4 | 4 | 4 | 2 | 4 | 3 | 4 | 4 | 1 | 2 | 3 | 3 | 4 | 4 | 5 |
| 4 | 2 | 5 | 4 | 4 | 5 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 |
| 5 | 5 | 4 | 5 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 5 |
| 4 | 2 | 4 | 5 | 4 | 4 | 5 | 3 | 2 | 4 | 4 | 5 | 4 | 5 | 4 | 5 | 4 |
| 4 | 4 | 4 | 4 | 4 | 3 | 4 | 2 | 3 | 4 | 4 | 4 | 3 | 5 | 4 | 5 | 5 |
| 2 | 2 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 |
| 4 | 3 | 4 | 4 | 2 | 4 | 4 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 |
| 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 4 | 5 | 4 | 5 |
| 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 5 |
| 4 | 5 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 5 | 5 | 5 | 5 |
| 4 | 5 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 5 | 5 | 5 | 5 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2 | 1 | 4 | 4 | 3 | 2 | 4 | 2 | 2 | 4 | 4 | 4 | 4 | 2 | 2 | 3 | 5 |
| 4 | 5 | 5 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 4 | 2 | 2 | 5 | 5 | 5 | 5 |
| 4 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 5 | 4 | 5 |
| 2 | 5 | 3 | 4 | 2 | 4 | 3 | 4 | 5 | 3 | 1 | 2 | 3 | 2 | 5 | 4 | 4 |
| 5 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 4 | 3 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 |
| 4 | 1 | 4 | 4 | 4 | 2 | 4 | 5 | 2 | 5 | 1 | 5 | 5 | 2 | 3 | 5 | 4 |
| 4 | 1 | 3 | 4 | 4 | 4 | 5 | 3 | 2 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 4 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4 | 4 | 5 | 4 | 4 | 2 | 2 | 2 | 4 | 5 | 2 | 4 | 5 | 5 | 5 | 5 |
| 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 |

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| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 5 | 2 | 5 | 4 | 4 | 5 | 5 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 |
| 2 | 1 | 3 | 2 | 1 | 3 | 2 | 3 | 2 | 2 | 4 | 3 | 2 | 3 | 3 | 3 | 4 |
| 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 5 |
| 4 | 3 | 4 | 5 | 5 | 5 | 5 | 2 | 1 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 |
| 5 | 2 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 5 | 2 | 4 | 5 | 5 | 2 | 4 | 4 | 2 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 4 |
| 4 | 1 | 4 | 4 | 3 | 2 | 3 | 3 | 5 | 3 | 4 | 4 | 3 | 3 | 4 | 2 | 5 |
| 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 1 | 4 | 3 | 5 | 5 |
| 4 | 1 | 4 | 5 | 4 | 2 | 3 | 2 | 2 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 4 |
| 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 5 |
| 4 | 2 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 4 | 4 | 3 | 4 | 4 | 4 | 5 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

| G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2 | 1 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 4 | 3 | 4 | 3 | 2 | 4 | 4 | 5 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 5 | 5 | 3 | 6 | 5 | 6 |
| 6 | 6 | 6 | 2 | 5 | 3 | 5 | 5 | 7 | 6 | 6 | 7 | 5 | 7 | 7 | 7 |
| 6 | 1 | 7 | 2 | 5 | 2 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 7 | 5 | 2 | 6 | 6 | 6 | 5 | 4 | 5 | 5 | 3 | 5 | 3 | 5 | 5 | 3 |
| 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 7 |
| 7 | 7 | 7 | 6 | 7 | 6 | 6 | 7 | 7 | 6 | 5 | 6 | 6 | 6 | 6 | 6 |
| 6 | 5 | 5 | 7 | 3 | 4 | 4 | 3 | 7 | 6 | 6 | 6 | 6 | 6 | 7 | 6 |
| 7 | 5 | 7 | 6 | 4 | 5 | 3 | 4 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 7 |
| 6 | 2 | 5 | 2 | 5 | 3 | 5 | 5 | 7 | 5 | 5 | 7 | 6 | 7 | 7 | 7 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 6 | 6 | 5 | 4 | 5 | 3 | 6 | 2 | 7 | 7 | 4 | 7 | 3 | 7 | 6 | 6 |
| 4 | 5 | 6 | 6 | 6 | 7 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 7 | 5 | 6 | 6 | 7 | 5 | 6 | 7 | 7 | 7 | 6 | 7 | 6 | 7 | 7 | 5 |
| 7 | 7 | 4 | 5 | 5 | 6 | 2 | 5 | 6 | 6 | 5 | 7 | 6 | 6 | 7 | 7 |
| 5 | 7 | 5 | 6 | 6 | 6 | 7 | 3 | 6 | 7 | 7 | 7 | 5 | 7 | 7 | 7 |
| 7 | 3 | 5 | 1 | 6 | 6 | 6 | 7 | 7 | 3 | 6 | 7 | 3 | 7 | 7 | 7 |
| 7 | 6 | 6 | 7 | 7 | 5 | 6 | 7 | 5 | 5 | 5 | 5 | 3 | 5 | 5 | 3 |
| 6 | 5 | 6 | 6 | 7 | 6 | 4 | 6 | 7 | 6 | 6 | 7 | 5 | 7 | 6 | 6 |
| 6 | 6 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 5 | 6 | 5 | 6 | 6 | 6 |
| 4 | 5 | 6 | 7 | 6 | 3 | 6 | 5 | 6 | 6 | 5 | 6 | 6 | 5 | 6 | 6 |
| 6 | 2 | 6 | 6 | 7 | 6 | 5 | 7 | 7 | 5 | 5 | 7 | 7 | 6 | 7 | 5 |
| 6 | 3 | 4 | 5 | 2 | 5 | 3 | 7 | 6 | 4 | 6 | 7 | 6 | 4 | 7 | 7 |
| 5 | 6 | 6 | 7 | 4 | 5 | 5 | 3 | 4 | 6 | 6 | 6 | 5 | 7 | 7 | 6 |
| 4 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 6 | 5 | 6 | 6 | 5 | 5 | 5 | 5 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 4 | 5 | 5 | 6 | 5 | 5 | 5 | 7 | 6 | 6 | 7 | 6 | 6 | 7 | 7 |
| 6 | 5 | 7 | 6 | 7 | 3 | 4 | 4 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 |
| 6 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 5 | 6 | 6 | 4 | 6 | 6 | 5 |
| 6 | 6 | 6 | 6 | 6 | 5 | 6 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 |
| 6 | 4 | 6 | 6 | 6 | 6 | 4 | 4 | 6 | 6 | 6 | 6 | 7 | 6 | 7 | 7 |
| 6 | 5 | 6 | 5 | 6 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 5 |
| 5 | 3 | 5 | 5 | 6 | 5 | 6 | 6 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | 6 |
| 7 | 7 | 6 | 6 | 7 | 3 | 6 | 6 | 5 | 6 | 5 | 6 | 4 | 6 | 5 | 6 |
| 6 | 5 | 6 | 6 | 5 | 5 | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 3 | 3 | 7 | 7 | 5 | 7 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 7 | 5 | 6 | 3 | 7 | 6 | 6 | 7 | 7 | 7 | 3 | 5 | 6 | 7 | 6 | 7 |
| 5 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 6 | 6 | 6 | 5 | 6 | 5 |
| 5 | 3 | 4 | 2 | 6 | 5 | 5 | 5 | 7 | 6 | 7 | 7 | 5 | 6 | 7 | 6 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 5 | 6 | 4 | 3 | 6 | 4 | 5 | 5 | 4 | 6 | 7 | 6 | 6 | 7 | 6 |
| 6 | 6 | 6 | 7 | 6 | 6 | 5 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 7 | 5 | 6 | 5 | 7 | 6 | 6 | 7 | 7 | 7 | 5 | 7 | 5 | 6 | 7 | 7 |
| 2 | 7 | 6 |   | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 1 | 4 | 4 | 2 | 5 | 7 | 4 | 5 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 3 | 6 | 6 | 6 | 3 | 5 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 5 |
| 4 | 6 | 7 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 6 | 7 | 6 | 7 | 7 | 6 |
| 7 | 6 | 5 | 5 | 6 | 5 | 6 | 6 | 7 | 5 | 6 | 7 | 7 | 6 | 6 | 7 |
| 5 | 3 | 5 | 5 | 5 | 3 | 3 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 |
| 7 | 6 | 6 | 5 | 4 | 5 | 5 | 4 | 6 | 6 | 6 | 7 | 4 | 7 | 7 | 6 |
| 6 | 5 | 4 | 5 | 5 | 3 | 4 | 5 | 6 | 6 | 5 | 6 | 5 | 6 | 6 | 7 |
| 6 | 6 | 6 | 6 | 6 | 4 | 6 | 6 | 5 | 6 | 5 | 6 | 4 | 7 | 7 | 6 |
| 4 | 3 | 3 | 5 | 5 | 3 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 3 | 5 | 1 | 4 | 2 | 2 | 4 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 |
| 6 | 5 | 6 | 5 | 5 | 6 | 5 | 3 | 4 | 3 | 4 | 6 | 3 | 5 | 5 | 5 |
| 3 | 5 | 6 | 7 | 7 | 5 | 5 | 7 | 6 | 6 | 6 | 6 | 5 | 7 | 7 | 7 |
| 7 | 6 | 6 | 5 | 7 | 5 | 5 | 6 | 7 | 5 | 6 | 7 | 5 | 6 | 7 | 6 |
| 5 | 5 | 3 | 4 | 5 | 5 | 4 | 4 | 6 | 5 | 5 | 6 | 5 | 5 | 6 | 6 |
| 5 | 5 | 5 | 7 | 5 | 4 | 5 | 4 | 4 | 3 | 6 | 6 | 3 | 6 | 6 | 2 |
| 6 | 5 | 6 | 5 | 6 | 6 | 6 | 3 | 6 | 6 | 5 | 5 | 6 | 6 | 5 | 4 |
| 6 | 6 | 5 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 |
| 5 | 2 | 3 | 6 | 5 | 5 | 3 | 3 | 7 | 5 | 6 | 7 | 6 | 6 | 7 | 6 |
| 5 | 4 | 5 | 5 | 6 | 4 | 5 | 5 | 7 | 5 | 7 | 7 | 4 | 5 | 7 | 5 |
| 6 | 5 | 5 | 7 | 7 | 5 | 5 | 7 | 6 | 7 | 6 | 6 | 6 | 7 | 6 | 5 |
| 6 | 6 | 6 | 5 | 6 | 5 | 6 | 7 | 7 | 7 | 6 | 6 | 5 | 7 | 7 | 7 |
| 6 | 6 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | 6 |
| 6 | 6 | 6 | 7 | 6 | 6 | 6 | 6 | 6 | 7 | 5 | 6 | 5 | 7 | 6 | 5 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 6 | 5 | 3 | 1 | 6 | 4 | 4 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 6 |
| 6 | 5 | 5 | 6 | 5 | 5 | 5 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 5 | 6 | 6 | 5 | 7 | 6 | 6 | 7 | 5 | 6 | 5 | 7 | 4 | 6 | 7 | 7 |
| 6 | 5 | 2 | 4 | 7 | 5 | 5 | 6 | 7 | 6 | 6 | 7 | 6 | 6 | 7 | 6 |
| 7 | 7 | 7 | 2 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 |
| 7 | 6 | 6 | 7 | 7 | 5 | 6 | 6 | 6 | 6 | 5 | 6 | 4 | 5 | 6 | 6 |
| 5 | 5 | 5 | 4 | 5 | 3 | 5 | 6 | 6 | 6 | 5 | 7 | 5 | 6 | 7 | 6 |
| 6 | 6 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 6 | 6 | 7 | 5 | 6 | 7 | 7 |
| 6 | 3 | 5 | 5 | 6 | 6 | 5 | 6 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 |
| 5 | 4 | 2 | 3 | 5 | 2 | 2 | 5 | 7 | 7 | 7 | 7 | 6 | 6 | 7 | 7 |
| 7 | 7 | 7 | 7 | 7 | 5 | 5 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 |
| 6 | 2 | 4 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 7 | 4 | 6 | 7 | 7 | 4 | 2 | 1 | 4 | 3 | 4 | 7 | 7 | 4 | 4 | 1 |
| 6 | 5 | 6 | 6 | 6 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |

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| L8 | L7 | L6 | L5 | L4 | L3 | L2 | L1 | P8 | P7 | P6 | P5 | P4 | P3 | P2 | P1 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 6 | 6 | 5 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 5 | 6 | 5 | 6 | 5 | 6 |
| 6 | 7 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 7 | 6 | 7 | 6 | 6 | 6 | 6 |
| 5 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 |
| 4 | 6 | 5 | 5 | 6 | 5 | 5 | 4 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 5 | 7 | 7 | 5 | 7 | 6 | 3 | 6 | 6 | 5 | 3 | 4 | 5 | 4 | 5 | 6 |
| 6 | 7 | 7 | 5 | 7 | 5 | 6 | 7 | 7 | 5 | 5 | 7 | 6 | 6 | 3 | 7 |
| 7 | 7 | 7 | 7 | 7 | 5 | 4 | 7 | 6 | 5 | 6 | 6 | 5 | 6 | 5 | 7 |
| 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 6 |
| 5 | 6 | 6 | 3 | 5 | 3 | 5 | 5 | 6 | 6 | 4 | 6 | 6 | 6 | 6 | 6 |
| 6 | 6 | 6 | 5 | 6 | 5 | 6 | 6 | 7 | 7 | 6 | 7 | 6 | 6 | 7 | 6 |
| 6 | 6 | 6 | 5 | 6 | 5 | 5 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 6 | 7 | 6 | 7 | 7 | 4 | 7 | 7 | 6 | 4 | 7 | 7 | 6 |
| 7 | 7 | 6 | 6 | 7 | 6 | 6 | 6 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 6 |
| 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 1 | 5 | 3 | 7 | 5 | 3 | 3 | 2 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 7 | 7 | 7 | 6 | 7 | 7 | 5 | 7 | 7 | 6 | 7 | 7 | 6 | 6 | 6 | 7 |
| 6 | 6 | 6 | 5 | 5 | 5 | 6 | 3 | 5 | 6 | 3 | 6 | 6 | 6 | 6 | 5 |
| 5 | 5 | 5 | 5 | 6 | 6 | 5 | 7 | 7 | 7 | 6 | 7 | 6 | 7 | 7 | 6 |
| 5 | 5 | 5 | 5 | 4 | 3 | 5 | 5 | 6 | 5 | 4 | 6 | 5 | 6 | 6 | 4 |
| 5 | 5 | 3 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 6 | 7 | 5 | 5 | 7 | 6 |
| 6 | 4 | 6 | 2 | 5 | 2 | 6 | 6 | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 7 |
| 5 | 5 | 5 | 6 | 4 | 5 | 3 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 7 | 4 | 3 | 5 | 7 | 2 | 5 | 7 | 7 | 7 | 5 | 6 | 5 | 7 | 6 | 5 |
| 6 | 5 | 7 | 6 | 7 | 5 | 5 | 6 | 7 | 7 | 6 | 6 | 5 | 7 | 7 | 6 |
| 6 | 5 | 5 | 7 | 7 | 3 | 5 | 7 | 7 | 7 | 6 | 7 | 6 | 7 | 7 | 6 |
| 6 | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 6 | 5 | 5 | 4 | 5 | 6 | 6 | 5 |
| 7 | 4 | 6 | 2 | 6 | 6 | 6 | 7 | 7 | 6 | 6 | 6 | 5 | 7 | 7 | 7 |
| 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 4 | 7 | 7 | 5 |
| 7 | 6 | 7 | 5 | 6 | 6 | 7 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 7 | 2 | 2 | 2 | 6 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 5 | 6 | 7 | 6 |
| 5 | 2 | 2 | 6 | 6 | 6 | 4 | 6 | 7 | 6 | 4 | 7 | 5 | 7 | 7 | 4 |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 |
| 6 | 5 | 6 | 7 | 6 | 5 | 7 | 7 | 7 | 5 | 6 | 7 | 6 | 7 | 6 | 5 |
| 5 | 5 | 5 | 4 | 2 | 6 | 5 | 4 | 6 | 6 | 6 | 7 | 5 | 6 | 7 | 6 |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 5 | 5 | 6 | 5 | 6 | 6 | 5 |
| 6 | 6 | 6 | 7 | 7 | 3 | 6 | 7 | 7 | 6 | 6 | 7 | 5 | 7 | 7 | 7 |
| 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 |
| 6 | 1 | 3 | 6 | 5 | 2 | 3 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 7 | 5 | 6 | 5 | 6 | 6 | 6 | 7 | 7 | 6 | 5 | 6 | 6 | 6 | 6 | 5 |
| 6 | 5 | 5 | 3 | 4 | 5 | 6 | 4 | 6 | 6 | 6 | 7 | 5 | 6 | 7 | 6 |
| 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | 7 |
| 5 | 6 | 5 | 3 | 6 | 5 | 6 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 |

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| L8 | L7 | L6 | L5 | L4 | L3 | L2 | L1 | P8 | P7 | P6 | P5 | P4 | P3 | P2 | P1 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 6 | 7 | 6 | 6 | 6 | 5 | 5 | 6 | 6 | 5 | 4 | 6 | 2 | 5 | 5 | 6 |
| 6 | 6 | 3 | 3 | 6 | 6 | 4 | 6 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 6 | 7 | 7 | 7 | 6 | 6 | 7 | 7 | 6 | 5 | 7 | 6 | 6 | 6 | 6 |
| 3 | 4 | 6 | 4 | 5 | 4 | 4 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 3 | 2 | 2 | 5 | 5 | 2 | 2 | 5 |
| 5 | 6 | 6 | 7 | 6 | 6 | 6 | 5 | 6 | 5 | 6 | 6 | 6 | 6 | 6 | 7 |
| 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 3 | 6 | 5 | 5 | 7 | 6 | 5 | 6 | 5 | 6 | 6 | 6 | 5 | 5 | 6 | 7 |
| 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 3 | 3 | 3 | 4 | 2 | 2 | 2 | 2 |
| 6 | 7 | 6 | 5 | 6 | 6 | 6 | 7 | 5 | 6 | 6 | 5 | 7 | 6 | 3 | 6 |
| 6 | 6 | 6 | 5 | 7 | 7 | 7 | 7 | 4 | 5 | 5 | 6 | 3 | 5 | 7 | 7 |
| 6 | 6 | 6 | 5 | 5 | 5 | 6 | 6 | 5 | 6 | 5 | 6 | 3 | 5 | 5 | 5 |
| 5 | 7 | 6 | 6 | 6 | 5 | 7 | 7 | 6 | 4 | 2 | 6 | 6 | 5 | 5 | 7 |
| 7 | 7 | 6 | 5 | 6 | 6 | 6 | 6 | 4 | 5 | 4 | 5 | 2 | 5 | 5 | 3 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 5 | 5 | 3 | 2 | 6 | 5 | 5 | 6 | 4 | 5 | 4 | 4 | 4 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 3 | 6 | 6 | 6 | 7 |
| 2 | 4 | 7 | 5 | 5 | 4 | 4 | 4 | 6 | 5 | 6 | 6 | 5 | 5 | 6 | 7 |
| 7 | 6 | 6 | 6 | 6 | 6 | 6 |  | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 7 | 7 | 7 | 7 | 7 | 5 | 7 | 6 | 6 | 6 | 6 | 6 | 5 | 7 | 7 | 7 |
| 6 | 3 | 4 | 5 | 6 | 4 | 4. | 6 | 6 | 6 | 5 | 6 | 5 | 6 | 6 | 3 |
| 6 | 6 | 3 | 6 | 6 | 5 | 5 | 6 | 6 | 3 | 4 | 6 | 4 | 3 | 5 | 5 |
| 3 | 3 | 6 | 6 | 5 | 3 | 5 | 5 | 6 | 5 | 6 | 6 | 5 | 7 | 5 | 5 |
| 6 | 5 | 5 | 3 | 5 | 4 | 3 | 3 | 3 | 5 | 5 | 7 | 5 | 4 | 5 | 5 |
| 5 | 5 | 6 | 5 | 6 | 3 | 5 | 5 | 7 | 7 | 6 | 6 | 7 | 6 | 6 | 6 |
| 7 | 5 | 6 | 7 | 6 | 3 | 6 | 6 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 6 |
| 5 | 6 | 6 | 5 | 6 | 6 | 7 | 6 | 6 | 7 | 6 | 6 | 5 | 7 | 6 | 5 |
| 6 | 5 | 7 | 3 | 5 | 4 | 5 | 5 | 6 | 5 | 6 | 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 5 | 6 | 6 | 6 | 6 | 5 |

| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 7 | 7 | 7 | 7 | 6 | 7 | 4 | 4 | 5 | 3 | 4 | 3 | 6 | 5 | 5 |
| 6 | 5 | 3 | 6 | 5 | 6 | 3 | 7 | 7 | 5 | 6 | 6 | 6 | 5 | 6 | 6 |
| 5 | 3 | 3 | 6 | 7 | 4 | 5 | 6 | 7 | 7 | 6 | 7 | 5 | 6 | 7 | 7 |
| 6 | 4 | 6 | 2 | 6 | 2 | 6 | 5 | 7 | 6 | 7 | 7 | 6 | 6 | 6 | 6 |
| 7 | 5 | 6 | 6 | 5 | 4 | 5 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 4 | 6 | 6 | 4 | 2 | 6 | 4 | 5 | 6 | 4 | 6 | 4 | 6 | 6 | 5 |
| 7 | 5 | 7 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 5 | 5 | 6 | 6 | 6 | 7 |
| 7 | 3 | 6 | 5 | 6 | 6 | 6 | 7 | 7 | 6 | 3 | 6 | 6 | 6 | 7 | 6 |
| 7 | 6 | 7 | 6 | 5 | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 5 | 6 | 5 | 6 | 6 | 7 | 5 | 6 | 6 | 4 | 5 | 4 | 6 | 5 | 5 |
| 6 | 4 | 5 | 5 | 6 | 6 | 5 | 6 | 6 | 6 | 4 | 6 | 4 | 7 | 6 | 6 |
| 6 | 4 | 5 | 5 | 6 | 6 | 5 | 6 | 6 | 6 | 4 | 6 | 4 | 7 | 6 | 6 |
| 7 | 5 | 6 | 6 | 7 | 2 | 6 | 7 | 5 | 5 | 5 | 6 | 3 | 3 | 6 | 2 |
| 7 | 7 | 7 | 1 | 7 | 7 | 6 | 3 | 1 | 3 | 1 | 1 | 1 | 3 | 2 | 2 |

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| L8 | L7 | L6 | L5 | L4 | L3 | L2 | L1 | P8 | P7 | P6 | P5 | P4 | P3 | P2 | P1 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 6 | 7 | 7 | 6 | 7 | 6 | 7 | 7 | 4 | 7 | 7 | 7 | 1 | 6 | 3 | 6 |
| 7 | 6 | 7 | 5 | 7 | 5 | 6 | 6 | 5 | 5 | 5 | 6 | 5 | 5 | 2 | 6 |
| 1 | 6 | 6 | 2 | 6 | 3 | 3 | 4 | 6 | 6 | 6 | 7 | 5 | 7 | 7 | 7 |
| 6 | 7 | 6 | 6 | 7 | 6 | 6 | 7 | 5 | 6 | 5 | 5 | 5 | 6 | 5 | 6 |
| 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 7 | 5 | 5 | 5 | 7 |
| 6 | 6 | 6 | 6 | 7 | 6 | 6 | 7 | 2 | 6 | 6 | 2 | 2 | 5 | 5 | 6 |
| 5 | 7 | 7 | 5 | 6 | 5 | 6 | 7 | 7 | 5 | 5 | 7 | 7 | 6 | 6 | 7 |
| 6 | 5 | 6 | 7 | 7 | 6 | 6 | 7 | 5 | 4 | 3 | 5 | 2 | 5 | 5 | 7 |
| 5 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 3 | 5 | 5 | 3 | 4 | 4 | 4 | 6 |
| 6 | 6 | 6 | 5 | 7 | 6 | 6 | 7 | 7 | 6 | 5 | 5 | 6 | 6 | 2 | 6 |
| 7 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 4 | 6 | 5 | 6 | 6 | 4 | 6 |
| 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 4 | 5 | 4 | 5 | 3 | 5 | 5 | 5 |
| 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 6 | 5 | 6 |
| 6 | 5 | 5 | 5 | 5 | 4 | 5 | 6 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |

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| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 3 | 4 | 5 | 6 | 6 | 4 | 5 | 5 | 7 | 5 | 6 | 7 | 5 | 6 | 7 | 5 |
| 2 | 1 | 3 | 4 | 2 | 2 | 2 | 5 | 7 | 6 | 7 | 7 | 5 | 6 | 7 | 6 |
| 6 | 4 | 5 | 1 | 4 | 3 | 3 | 6 | 6 | 5 | 5 | 6 | 6 | 7 | 6 | 6 |
| 5 | 4 | 4 | 5 | 5 | 4 | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 5 | 6 | 5 | 7 | 6 | 6 | 7 | 6 | 6 | 4 | 5 | 6 | 6 | 6 | 5 |
| 6 | 4 | 6 | 5 | 5 | 3 | 4 | 6 | 7 | 4 | 6 | 6 | 6 | 5 | 5 | 6 |
| 4 | 3 | 4 | 6 | 7 | 5 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 5 | 6 | 5 | 7 | 6 | 7 | 6 | 5 | 6 | 6 | 7 | 4 | 7 | 7 | 5 |
| 2 | 2 | 2 | 6 | 2 | 2 | 2 | 2 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6 | 6 | 6 | 5 | 6 | 5 | 5 | 5 | 7 | 6 | 6 | 6 | 5 | 7 | 6 | 7 |
| 6 | 4 | 6 | 6 | 4 | 4 | 6 | 4 | 6 | 6 | 5 | 6 | 5 | 6 | 5 | 6 |
| 6 | 5 | 5 | 3 | 5 | 3 | 6 | 4 | 7 | 6 | 6 | 6 | 5 | 5 | 6 | 3 |
| 5 | 5 | 6 | 7 | 6 | 3 | 5 | 5 | 5 | 5 | 6 | 6 | 4 | 6 | 5 | 6 |