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GOOGLE TRENDS DATA AS A PROXY FOR INTEREST IN LEADERSHIP

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GOOGLE TRENDS DATA AS A PROXY FOR INTEREST IN LEADERSHIP

By

FINLEY W. WALKER

A doctoral dissertation submitted to the
College of Education
in partial fulfillment of the requirements
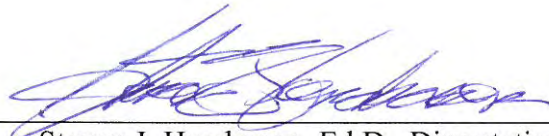for the degree Doctor of Education
in Organizational Leadership

Southeastern University
February, 2019

GOOGLE TRENDS DATA AS A PROXY FOR INTEREST IN LEADERSHIP
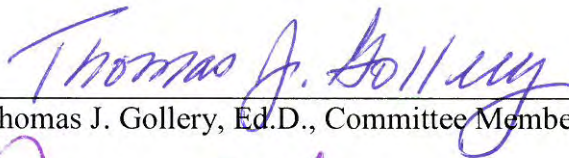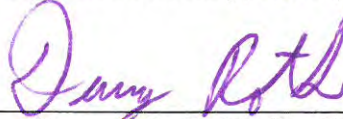
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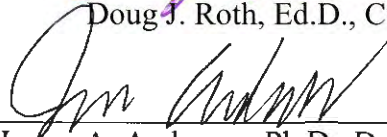
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DEDICATION

      This dissertation is dedicated to my King, Jesus, who leads me; to the love of my life, Carmen, who gives me the courage and inspiration to lead; and to all those who pursue that noble calling to lead.

ACKNOWLEDGMENTS

No dissertation belongs to just one person.

The following study does not really address why someone pursues leadership. I cannot say for certain why someone else is interested in leadership, but I can say why I am interested in leadership: it is because of those that I acknowledge here, the ones who have inspired me. I am a dwarf standing on the shoulders of giants—*nanos gigantum humeris insidentes*.

I would like to thank Dr. Henderson for being my guide through this long journey. I could not have navigated the course successfully without a proper captain. I would like to thank Dr. Gollery for his humble expertise in methodology. He helped hone the direction of my research questions and analysis when the point of all this research was unclear. I would like to thank Dr. Roth for being there from the beginning until the end and for being a role model of excellence. It seems fitting to celebrate the closure of my doctoral studies with the professor I first began with at orientation years ago. I would like to thank Dr. Campbell for her diligence and patience in helping me to edit and revise my dissertation. If anything to follow is intelligible, it is due to her. Finally, I would like to thank all my professors and peers who have contributed to making my doctoral journey such a blessed one. It has been a pleasure to be in the midst of a cohort so brilliant and passionate. I thank Southeastern University for crafting a culture of servant leadership and for giving me the opportunity to pursue something more. All remaining errors are my own.

ABSTRACT

The purpose of this quantitative study was to investigate the observable patterns of online search behavior in the topic of leadership using Google Trends data. Institutions have had a historically difficult time predicting good leadership candidates. Better predictions can be made by using the big data offered by groups such as Google to learn who, where, and when people are interested in leadership. The study utilized descriptive, comparative, and correlative methodologies to study Google users' interest in leadership from 2004 to 2017. Society has placed great value into leadership throughout history, and though overall interest remains strong, it appears that the expression of that interest may have changed over time. Key findings revealed that interest in leadership often peaks during the spring and fall seasons while dipping during the summer and the winter holiday seasons. Leadership interest also appears to be more concentrated in geographic locations that home certain universities and political arenas.

Keywords: predicting leadership, leadership interest, leadership profile, big data, Google Trends

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I. INTRODUCTION

"Here is a trustworthy saying: Whoever aspires to be an overseer desires a noble task" (1 Timothy 3:1, New International Version); or as The Message paraphrases, "If anyone wants to provide leadership in the church, good!" To want to be a leader is to want a good thing. Yet this axiom begs a question: Who is the whoever? Though the desire to be a leader may be a good thing, why is there the desire? Why does someone aspire to be a leader? Why are people interested in leadership in the first place? Is there a type of person who is more likely to be interested in leadership? A concept which initially seems obvious quickly becomes an epistemological conundrum. Some questions may not have readily available answers. Some of the answers are perhaps beyond this astral plane; they are certainly beyond the scope of this current study.

However, if the pursuit of leadership is accepted as noble, then the pursuit to better understand what causes humanity to be interested in and aspire to leadership is also a worthwhile endeavor. Determining the exact "why" of someone's interest may prove elusive, and therefore, was not breached in this current study. Perhaps the pursuit would be better served by beginning with "who" is interested. Examining factors that relate to a person's interest in leadership may offer a look into the contextual crucible in which leaders are born. By exploring the temporal and spatial circumstances of a person's interest, perhaps society can better aspire to that noble

task. The researcher of this current study aimed to investigate the topic of leadership by utilizing what has become one of the most ubiquitous tools ever used by civilization: Google.

The following dissertation attempted to determine "a temporal or spatial pattern of interest" (Mohebbi et al., 2011, p. 1) in the term *leadership* by using Google users' search behavior as a proxy for interest. This first chapter introduces the study, presents the background of the study, specifies the problem of the study, describes its significance, and provides an overview of the methodology used. The chapter concludes by noting the delimitations of the study and defining some special terms used.

Background of the Study

On September 27, 2018, Google celebrated its 20th birthday, and in just two decades, the search engine behemoth has irrevocably changed the world of information. If Google were a person, he or she would be an undergrad in college: wide-eyed, mystified, and full of potential. As was said regarding its genesis:

A little more than one decade ago, Google was founded with an ambitious goal: to organize the world's information. Its success is well-documented. There is a little-discussed side effect of Google's staggering success: Google not only finds and organizes existing information; its existence has created important new information. How people interact with the world's great information database is itself immensely informative.…It does not seem extreme to call Google search queries the most impressive dataset ever collected on the human psyche. (Stephens-Davidowitz, 2013, p. 1)

The use of Google has become so prevalent that the name has become irretrievably tied to the concept of a search engine. People no longer talk about searching the Web. They simply say, "Google it." Google is used as a noun and a verb; it is both a thing and an idea. Google, as

one of the newest eponyms, has become the veritable Band-Aid, the Kleenex, the Scotch Tape, or the Xerox of search engines. By 2015, over 75% of Americans had home access to the Internet (Ryan & Lewis, 2017). According to comScore (2016), over 60% of searches by this time were performed on Google. Around the world, Google users conduct 40,000 search queries every second, 3.5 billion searches every day, and 1.2 trillion searches every year (Google Search Statistics, 2017). Therefore, to say that Google has much to reveal about humanity is no stretch of the imagination. Google not only impacts the Internet and how people obtain information; it also impacts how people understand human thought and behavior. With the help of search engine data, researchers can gain insights into people's perceptions, interests, and values. The topic of leadership is one area of social science that researchers can explore with Google data. This study seeks to be a first step of many in the journey.

The following subsections outline some historical and theoretical contexts for utilizing Google as a platform and instrument for research. Factors considered when conceptualizing and executing this current study included societal factors, intellectual factors, professional factors, and research factors (Joyner, Rouse, & Glatthorn, 2013).

Societal Factors

Technology changes society. Technology changes the way people think; it changes what is expected and considered normal. Ten years ago, few people saw the value of a smartphone. Today, most people would find it difficult to imagine not having their smart devices. Technology in general, and the Internet specifically, exposes human nature in a way that few things can.

Every time we type into a search box, we reveal something about ourselves. As millions of us look for answers to questions or things to buy or places to meet friends, our

searches produce a map of our collective hopes, fears, and desires. (Vedantam, 2017,

para. 7)

Google acts as a sort of anonymous confessional booth. It serves as a proxy for humanity's

innermost proclivities. The context of a search box means that Google can reveal the implicit

bias that may normally go unnoticed by traditional research methods.

Intellectual Factors

Digital data offers us insights into insights—to help us know what we did not even know

that we did not know. We may have thought we knew, but we did not. Researchers have used

surveys for years to glean meaningful information. However, the social desirability bias in

surveys is often too strong to really get anything of value (Vavreck, 2007). The results are often

too complicated by uncontrolled variables such as nonresponse bias (Stephens-Davidowitz,

2012). Google can help even the playing field, so to speak, and uncover the crux of the matter.

Researcher Stephens-Davidowitz (2017) wrote,

The microscope showed us there is more to a drop of pond water than we think we see.

The telescope showed us there is more to the night sky than we think we see. And new

digital data now show us there's more to human society than we think we see. (p. 16)

Professional Factors

Google Trends was released in 2006. What was first seen as just another marketing tool

at best and a toy at worst is now becoming a powerhouse in research. Google Trends allows the

user to look at search engine data on a macro scale. Researchers can track the relative volume of

searches conducted for a particular word or phrase from year to year, and they can see how

queries compare from state to state or country to country. Researchers can also observe the

overall trend in use over time and discover when interest peaks. Marketers can easily use this

information to help them know when, what, and how to advertise their products. This information can help researchers to observe and predict people's behavior.

Google Correlate is another online program useful to researchers. Researchers at Google have used the Correlate instrument to produce accurate models of influenza activity and home refinance rates in the United States (Mohebbi et al., 2011).

Several other professional factors are relevant to pursuing an understanding of interest in leadership including a continuing concern for next-generation leaders, increasing research into leadership practices, the expanding role of technology in business, and technology's impact on cognitive development.

Research Factors

Stephens-Davidowitz is a pioneer in the use of Google data for research. He used evidence from Google search data to help determine phenomena such as the cost of racial animus on a black candidate, predicting voting turnout, and determining the impact of economic downturns on unreported victims of abuse (Stephens-Davidowitz, 2013).

Using Google data as a methodology for research is still at a relatively young stage. However, the field and practice are quickly growing. Research suggesting Google data can be useful in social science includes Askitas and Zimmermann (2009), Choi and Varian (2009a), Ginsberg et al. (2009), Scheitle (2011), Seifter, Schwarzwalder, Geis, and Aucott (2010), and Stephens-Davidowitz (2013a). The value of and argument for search engine data are undeniably strong. Time and again, the predictions prove more robust than other available indicators (Stephens-Davidowitz, 2013a).

Overview of the Literature

Studying a topic like personal interest can be deceptively difficult, especially if considering that the underlying motivations for that interest may not be ostensible. Therefore, this current study did not purpose to look into any deeper motivations for pursuing leadership. The current study only focused on using online search behaviors as a proxy for determining interest in leadership. Primarily, research has focused on building a psychological profile of a leader (Francis, Gubb, & Robbins, 2009; Francis, Robbins, & Ryland, 2012; Powell, Robbins, & Francis, 2012). Stein, Papadogiannis, Yip, and Sitarenios (2009) found that leaders tend to display higher levels of emotional intelligence compared to their followers. Other studies have shown that leaders exhibit high levels of social interest (Knutson & Miranda, 2000; Knutson, Miranda, & Washell, 2005).

At a more basic level, researchers have investigated the characteristics of what is perceived as good leadership. Litzenberg and Schneider (1989) identified interpersonal characteristics and communication skills as the most important skills for effective leaders. Furthermore, knowledge, interpersonal skills, emotional intelligence, and vision have been found as critical to the success of aspiring leaders (Taylor, Taylor, & Stoller, 2008). Beginning in the 1950s, researchers at Ohio State University developed the Leader Behavior Description Questionnaire (LBDQ) to make statements about leadership potential (Fisher College of Business, 1962; Stogdill, 1963). In the 1960s, the managerial or leadership grid was developed by management theorists Blake and Mouton (1994) as a framework for assessing leadership potential. The authors distinguished between leadership styles that are concerned with people versus leadership styles that are concerned with results.

Beyond creating personal profiles and characterizations for leaders, some researchers have also looked at sociological aspects. For example, an interest in leadership may be tied to social normalizing such as gender bias and generalization (Hunt, Gonsalkorale, & Zadro, 2014). In other words, people become interested in leadership simply because society has either facilitated the interest or expected the interest of certain groups (e.g., white, upper-class males). Continuing with the cultural context, Nowell and Harrison (2010) noted that leadership capacities are most prominently rooted in the organizational and institutional contexts even more so than passion, knowledge, and leadership skills. Meindl, Ehrlich, and Dukerich (1985) also explored the prominence of the concept of leadership in society's collective consciousness.

Research has also emphasized factors that relate to a person's pursuit of leadership roles. Galdames and Gonzalez (2016) found indications that age, professional training, and opportunities to exercise leadership were relevant variables in understanding the level of interest of teachers to become principals. Other studies found that self-esteem was strongly linked to leadership aspirations (Hernandez Bark, Escartin, Schuh, & Dick, 2016; Mason, Mason, & Mathews, 2016).

Theoretical Foundations and Conceptual Framework

The prime theoretical foundations for this current study were derived from Engel's (1977) biopsychosocial model and Bronfenbrenner's (1979) ecological systems theory. These foundations are cornerstones in their respective fields to understanding human development, cognition, and behavior. The two theoretical foundations were then combined with an extensive review of the literature to envision a conceptual framework (seen in Figure 1) displaying the major factors that foster an interest in leadership.

Need for the Study

As shown in the conceptual framework, a person's interest in leadership is a result of several interacting factors: innate characteristics/abilities, personality profile, societal/cultural expectations, and environmental opportunities. Of these factors influencing the aspiring leader, ecological circumstances lend well to research by way of online search behavior. Therefore, this current study focused solely on environmental factors such as time and space. As a relatively new method for collecting and analyzing data, Google provides insights into the

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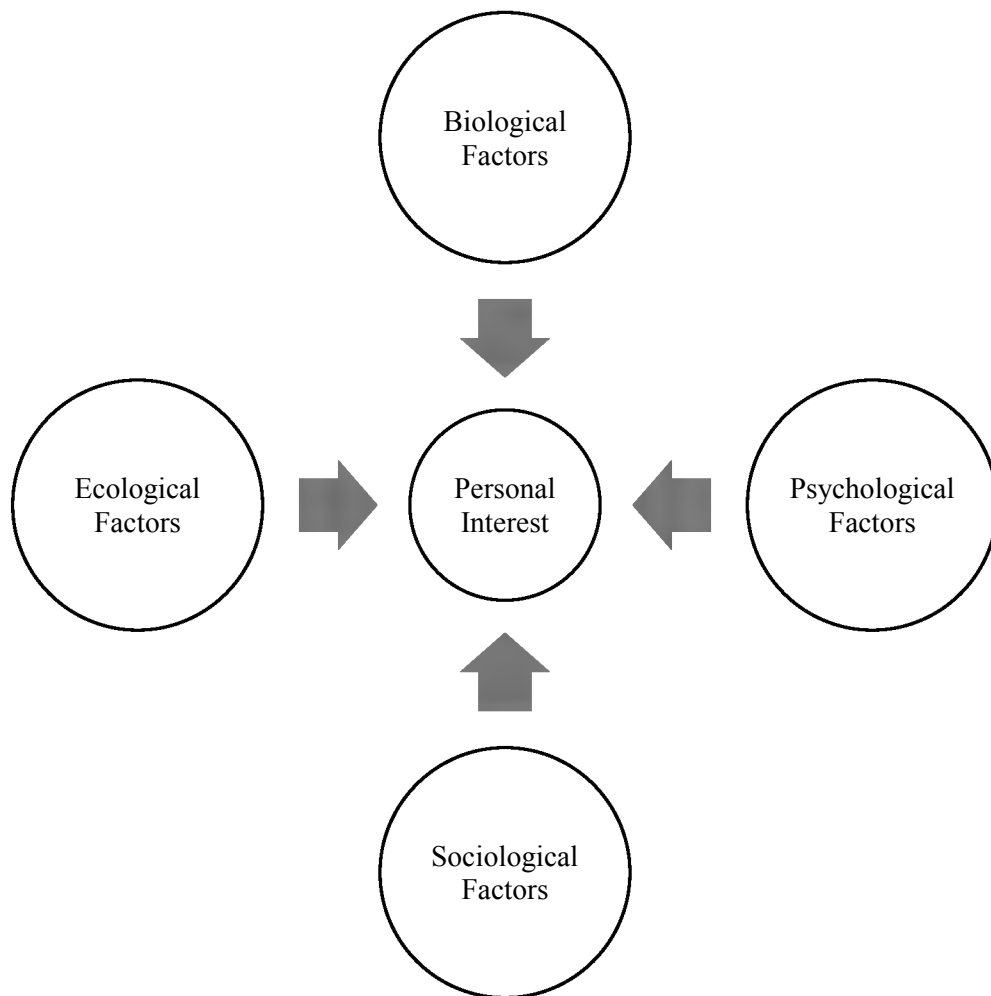
Figure 1. Conceptual framework displaying the various and interrelated factors that may contribute to a person's overall interest in leadership.

temporal and spatial patterns of interest of its users. Here, interest is to mean the frequency of

search queries conducted by Google users. In other words, the knowledge base of leadership

research can be bolstered by looking at the time and space—the when and where—of Google

users who are interested in the topic of leadership. Since interest in leadership was the focus of

the research, the review of the theoretical and empirical literature in Chapter 2 reviews published

studies on the characteristics and factors for interest in leadership. The researcher of this current

study implemented a conceptual organizational pattern to the review by identifying the major

concepts or factors appearing in the literature and then organizing the review accordingly.

<div align="center">**Problem Statement**</div>

Voluminous pages have been devoted to the purposes, practices, methods, and strategies

of leadership. This current study is not intended to add to the "what makes a good leader"

discussion. Rather, the objective is simply to gain some insights into variables which are related

to a person's interest in leadership. More specifically, the current study used online search

behavior as a proxy for interest to investigate components of Google users' interest in leadership.

The research topic, problem, and statement can be delineated as follows:

- Research topic: leadership

- Research problem: lack of research concerning interest in leadership

- Problem statement: Given the lack of research and limited understanding of what
  factors contribute to a person's interest in leadership, what variables (e.g., timespan,
  geographic location, political spectrum) are related to an interest in leadership using
  Google data?

Purpose of the Study

The purpose of this current study was to examine variables which are correlated with an interest in leadership. The study observed and compared relationships between Google searches for the term *leadership* and the demographics of time of year, geographic region, and municipal politics. The study was of a descriptive, comparative, and correlational nature in analyzing Google data as they relate to an interest in the topic of leadership. In this current study, interest refers to the relative volume of online searches for the term leadership as provided by Google Trends.

Research Questions

Research questions were framed around the temporal spans of January 1, 2004 (the earliest Google Trends data available), to December 31, 2017 (to demarcate a succinct time frame from which to analyze the data). Research questions were also framed around the spatial component of the 50 U.S. states and the District of Columbia. The research questions include:

1. Was interest in the topic of leadership, described as leadership interest, normally distributed during the time period of 2004 through 2017 using Google Trends?

2. Was interest in the topic of leadership, described as leadership interest, statistically significantly different from the years 2004 through 2006 in comparison to the time period of 2014 through 2016 using the Google Trends data platform?

3. Was interest in the topic of leadership, described as leadership interest, normally distributed for states during the time period of 2004 through 2017 using Google Trends?

4. Was interest in the topic of leadership, described as leadership interest, statistically significantly different for states during the time period of 2004 through 2006 in

comparison to the time period of 2014 through 2016 using the Google Trends data platform?

5. Was interest in the topic of leadership, described as leadership interest, statistically significantly different for high search volume cities only in comparison to the inclusion of low search volume cities during the time period of 2004 through 2017 using the Google Trends data platform?

6. Was interest in the topic of leadership, described as leadership interest, statistically significantly different for high search volume cities within Florida only in comparison to the inclusion of greater metro areas in Florida during the time frame of 2004 through 2017 using the Google Trends data platform?

7. To what degree does the political preference of major U.S. cities associate with and predict interest in leadership in those cities represented in the study's sample from 2004 through 2014 using Google Trends and a city conservatism score?

Research Hypotheses

Research hypotheses are defined using the null and further outlined below. In assuming that the expected values would be equal, the null hypotheses were as follows:

1. The proportion of Google searches will be evenly distributed between the months of the year. There will be no difference in interest in leadership based upon the time of year.

H_0: $P_1 = \ldots = P_{12}$

H_1: $P_1 \neq \ldots \neq P_{12}$

$\alpha = 0.05$

2. The proportion of Google searches will be evenly distributed between the two sets of time periods. There will be no difference in interest in leadership based upon the time frame.

H_0: $P_1 = P_2$

H_1: $P_1 \neq P_2$

$\alpha = 0.05$

3. The proportion of Google searches will be evenly distributed among the 51 states. There will be no difference in interest in leadership based upon the geographic state.

H_0: $P_1 = \ldots = P_{51}$

H_1: $P_1 \neq \ldots \neq P_{51}$

$\alpha = 0.05$

4. The proportion of Google searches will be evenly distributed among the 51 states between the two sets of time periods. There will be no difference in interest in leadership based upon the geographic state and time frame.

H_0: $P_1 = P_2$

H_1: $P_1 \neq P_2$

$\alpha = 0.05$

5. The proportion of Google searches will be evenly distributed between low search volume cities and high search volume cities. There will be no difference in interest in leadership based upon the search volume.

H_0: $P_1 = P_2$

H_1: $P_1 \neq P_2$

$\alpha = 0.05$

6. The proportion of Google searches will be evenly distributed between high search volume cities in Florida and the greater metro areas in Florida. There will be no difference in interest in leadership based upon the search volume.

H_0: $P_1 = P_2$

H_1: $P_1 \neq P_2$

$\alpha = 0.05$

7. The proportion of Google searches will be evenly distributed among the cities identified as politically conservative and the cities identified as politically liberal. There will be no difference in interest in leadership based upon political ideology.

H_0: $P_1 = P_2$

H_1: $P_1 \neq P_2$

$\alpha = 0.05$

Professional Significance of the Study

The current study has the potential for what is known as professional significance (Joyner et al., 2013). This study of Google search behavior as a proxy for interest in leadership makes a small contribution to the knowledge of leadership studies and the use of archival Web browser search data in research. Though there have been many anecdotal reports from leadership pundits and Fortune 500 executives on where leadership begins, such reports lack the scope, breadth, and data-driven analysis of this study. The significance of the current study includes the following four points. First, there is a lack of literature on the topic of using online search data to evaluate leadership interest. Second, this current study advances knowledge in the field of leadership research as it suggests relationships between phenomena and extends the predictive power of psychological profiling. Third, the study examines a real-world setting and, therefore, affects

organizations, as the results can be valuable to practitioners. Fourth, the methodology and instrument are promising and utilize an untapped potential in social science research. Because the research topic is leadership, the results from this study have the potential to impact all sectors—public, private, and non-profit. For example, universities with leadership programs may modify their recruiting methods based upon high-volume search results in certain regions of the country.

Overview of the Methodology

The Statistical Package for the Social Sciences (SPSS) was used to conduct statistical analyses on queried data collected from Google Trends. Preliminary data was drawn from Google Correlate, YouTube, Amazon, and other sources to provide further descriptive statistics and to provide a foundational basis for using online data. The research perspective, type, subtype, and method can be demarcated as follows:

- Research perspective: quantitative, positivist epistemology

- Research types: descriptive, comparative, and correlational

- Research subtypes: K-S test, t test, Pearson correlation coefficient

- Research method: observations and analyses of archival time series

The sample was selected using Google Trends data which, among many variables, reports on search engine data of all 50 states and the District of Columbia going back to 2004. Data were also utilized from Tausanovitch and Warshaw's (2014) findings which established normalized scores for major U.S. cities depending on whether they leaned conservative or liberal politically. Predictor variables included the nominal and categorical variables of specific state and the time of the year, as well as the variable of conservative-liberal score. The outcome variable was "interest in leadership" and was determined by the discrete volume of Google

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queries. In this current study, interest was defined as the relative frequencies of Google searches for the term leadership. The geographic state and month of the year were measured using a K-S test and a *t* test. The political score was measured using a Pearson product-moment correlation coefficient (*r*).

There are no participants in the study per se; rather the study focused on archival examination of aggregate, anonymous Google search data from users in the United States. Data can be exported from Google as normalized scores (Google, 2011, 2018).

The topic of methodology is more fully discussed in Chapter 3. The discussion is organized in the following manner:

1. Type of research and specific subtype

2. Context and access

3. Participant selection

4. Instrumentation

5. Data collection

6. Data analysis

Overview of Analysis

The data analysis process included organizing, reducing, analyzing, explicating, and displaying the data collected. Descriptive statistics included frequency counts, percentages, means, measures of central tendency, and variability. The analysis centered on looking at relationships between the variables and an interest in leadership. An alpha level of $p < .05$ was used as the threshold for evaluating the statistical significance of findings. A correlational analysis is appropriate for the final research question of this current study because, as Field (2013) described,

Correlational research provides a very natural view of the question we're researching because we are not influencing what happens and the measures of the variables should not be biased by the researcher being there (this is an important aspect of ecological validity). (p. 13)

Limitations and Delimitations of the Study

The limitations and delimitations of a study describe "the boundaries of the study and ways in which the findings may lack generalizability" (Joyner et al., 2013, p. 209). These boundaries are discussed below.

Limitations

The main parameter placed on the method is that raw data were not collected and used for the purposes of this analysis. Instead, standardized scores were used based upon search queries conducted over time and by geographic location. Another limitation of the study is that the data cannot speak to the motives and intentions of particular users conducting Google searches. Researchers cannot know why the searches are conducted, only that they were conducted and how those searches relate in volume to other searches. Therefore, the current study is limited by what information Google has and provides about the inquirer; information collected by Google includes only certain demographics such as when and where the search originated. To recapitulate, this study is not about motivations or the where interest stems from. The study is only about when and where search activity is taking place.

Delimitations

The nature and size of the sample are not precisely defined. As a research instrument, Google is a dynamic tool that is constantly changing as it is used and updated every day.

Nevertheless, the sample represents Google searches for the topic of leadership, and thus represents millions of queries.

The setting for this current study is unique because it does not take place at an institution, a lab, or an office. Rather, the lab setting takes place across the United States within the intimacy and candidness of people's own personal devices. The archived data to be collected and analyzed spans from 2004 to 2017. The current study has also been delimited by not addressing the deeper "why" questions of leadership. The study only focused on the real-time behaviors of searchers due to the lack of insight that Google is able to provide about the personal reasons for information seeking behavior.

Cautions

Some cautions to note when using Google data to conduct research include:

- Individual search rates are based on unknown and unpredictable reasons. Therefore, insights into the motivations of users are difficult to decipher, and researchers must be careful not to overemphasize what is measurable.

- As Google has grown and gained users over time, the very composition of searchers has changed. For this reason, Stephens-Davidowitz (2013a) found that "comparing the size of changes in different areas and studying high-frequency changes usually lead to meaningful conclusions, whereas studying long-term national trends very often do not" (p. 79).

- Search data are limited by volume. Google Trends does not report absolute search volume, but only reports searches normalized to give a relative volume. Therefore, other tools such as Google Correlate and AdWords may be needed to supplement future research.

- When using Google search data, researchers may need to explore alternative explanations for changing search trends. Omitted-variable bias often plays a crucial role in preventing a correlation from being described as a causation. For example, changing media attention can throw off analyses. "Google data can most fruitfully be used when combined with other data sources. If both Google searches and an extreme, always reported outcome show similar trends, this is more convincing evidence than either data point alone can provide" (Stephens-Davidowitz, 2013, p. 95).

- Important to remember is the curse of dimensionality when utilizing such large data sets. Problems quickly arise when too many variables are used to try and find just one correlation. "If you test enough things, just by random chance, one of them will be statistically significant" (Stephens-Davidowitz, 2017, p. 248). The issue of multi-dimensionality is related to the concept of an error of the first kind, also known as a false positive finding or the look-elsewhere effect.

Assumptions of the Study

This current study assumed that Google queries for the term leadership represents a population of users who are actually interested in leadership. For the purposes of this study, Google search behavior was used as a proxy for user interest in leadership. In totality, the relative search volumes for information seeking on leadership was only understood as a component of overall interest. The study also assumed that Google's search algorithms were working properly at the time of the data collection.

Definitions of Key Terms

- *Big data* typically, though not exclusively, refers to any collection of massive, unstructured digital content. The Internet is a common example of big data.

- *Correlational studies* attempt "to understand patterns of relationships among variables. Although such studies cannot prove causation, they are useful in predicting one variable from another or building a theory about a complex phenomenon" (Joyner et al., 2013, p. 119).

- *Descriptive studies* are "used to describe the characteristics of a population by directly examining samples of that population" (Joyner et al., 2013, p. 120).

- *Ecological validity* is defined as "evidence that the results of a study, experiment or test can be applied, and allow inferences, to real-world conditions" (Field, 2013, p. 874).

- *Google Correlate* is an extension of Google Trends that "finds search patterns which correspond with real-world trends" (Google, 2011, para. 1).

- *Google Trends* is a feature of Google's services first made available in 2006 that provides data on search engine trends (Google, 2018a).

- *Nonresponse bias* is the distinctive bias generated by the subset of a sample population which is either more likely or less likely to respond to a survey voluntarily.

- *Outcome variable* is defined as "a variable thought to change as a function of changes in a predictor variable" (Field, 2013, p. 8). This variable is also known as the dependent variable.

- *Predictor variable* is defined as "a variable thought to predict an outcome variable" (Field, 2013, p. 8). This variable is also known as the independent variable.

- *Social desirability bias* is the inborn bias generated by individuals within a sample population who answer questions based upon social desirability rather than fact.

- The *World Wide Web*, or just *Web* for short, is the most commonly used protocol to find, access, and share content on the *Internet*. Technically speaking, the Internet and the Web are distinct entities. The Internet is the immense network infrastructure that allows computers to connect and communicate with each other. The Web is an information-sharing tool that is utilized within the Internet structure. Today, however, the two terms are often used identically, and thus the terms will be used interchangeably in this current dissertation.

Summary

In précis, this current study ventured to begin a scholarly investigation of those who may aspire to leadership—or at the very least, those who seek to know more about leadership. The researcher of this study examined how an interest in leadership is related to the variables of time of year, geographic region, and designated political penchant. By utilizing Google search data, this current study contributed to the literature by building onto the profile of an aspiring leader. Through gaining this knowledge, two principal benefits arise: (a) universities and businesses will have a model for more reliable recruitment of potential leaders; and (b) researchers will have another ingredient in building the profile of what makes a good potential leader.

In this first chapter, an overview of the study that took place was described. Chapter Two details a review of the literature. A fuller explanation of the methodology used is provided in

Chapter Three, and the results of the analyses conducted are provided in Chapter Four. Finally,

Chapter Five contains a discussion of the findings along with some concluding thoughts.

II. REVIEW OF LITERATURE

The following review presents a summary of using search engine data, and Google in particular, in modern research. The review of literature also provides some of the key theoretical and empirical literature on the subject of leadership interest. Major themes and subthemes are discussed within the context of a conceptual framework.

Overview of the Chapter's Organization

As briefly noted in Chapter One, a person's interest in leadership is a result of several interacting factors. Of these factors influencing the aspiring leader, the use of online search behavior is one area of research that can add to the literature. Online search data can be utilized as a proxy to discover temporal and spatial characteristics of users interested in leadership. The literature review contains an overview of how researchers have utilized Google data in their studies to provide a strong theoretical basis for using Google Trends data within the current study.

Furthermore, since interest in leadership is the focus of the current research study, this chapter contains a review of published studies on the characteristics of aspiring leaders, motivations of aspiring leaders, and the background of leaders. In this endeavor, the current researcher implemented a conceptual organizational pattern to the literature review. By conducting a conceptual analysis of the literature, major concepts or factors appearing in the

literature were identified and then organized accordingly. Topics include the biological, psychological, sociological, and environmental factors that influence a person's interest in leadership. The review concludes with a summary section.

Literature Using Google Data

This first section of the literature review discusses the uses and potential uses of Google data as a methodological instrument. The literature using search engine data, especially that of Google data, has seen exponential growth over the past decade (Choi & Varian, 2009a; Ginsberg et al., 2009; Mohebbi et al., 2011; Stephens-Davidowitz, 2017). Web search activity has especially been shown useful for providing estimates of real-world activity in health and economics (Mohebbi et al., 2011).

Search engine data has been used to measure investor attention and predict stock trajectory (Da, Engelberg, & Gao, 2011), to measure voting intention in different parts of the United States (Stephens-Davidowitz, 2013b), to look at racially charged language to estimate the votes a candidate loses due to bigotry (Stephens-Davidowitz, 2014), to detect regional trends in youth and adult tobacco use (Cavazos-Rehg et al., 2015), to track dengue outbreaks (Gluskin, Johansson, Santillana, & Brownstein, 2014; Strauss et al., 2016; Yang et al., 2017), and to track the Zika virus outbreak (Majumder et al., 2016; McGough, Brownstein, Hawkins, & Santillana, 2017).

Before Google Trends was released, Eysenbach (2006) forged a method for using online user behavior to research environmental phenomena. Eysenbach (2006) correlated data from the 2004-2005 Canadian flu season with ad campaign measures and the number of user clicks in hopes of quickening public health response to outbreaks. He labeled this method of syndromic surveillance as information epidemiology or "infodemiology" (Eysenbach, 2006, p. 244).

Choi and Varian (2009a) were probably the first to show the true potential of Google

Trends data. The researchers used Google Trends to present current prediction patterns for retail

sales (motor vehicle and parts dealers), automotive sales (by make), home sales, and travel (visits

to destinations). The researchers lamented how government data on economic conditions

typically take a month or more to be released. Moreover, these reports are not only slow, but

they are also only available with a lag of often several weeks. In contrast, "Google Trends

provides *daily and weekly* reports on the volume of queries related to various industries" (Choi &

Varian, 2009a, p. ii). The researchers hypothesized that

> This query data may be correlated with the *current* level of economic activity in given
>
> industries and thus may be helpful in predicting the subsequent data releases. We are not
>
> claiming that Google Trends data help predict the future. Rather we are claiming that
>
> Google Trends may help in *predicting the present.* (Choi & Varian, 2009a, p. ii)

For instance, the current weekly volume of searches for a specific brand of automobile may

prove beneficial in predicting the sales for that brand when the report is released the following

month.

In another paper, Choi and Varian (2009b) applied their previous methodology to a U.S.

unemployment time series. They compared initial claims for unemployment with two labor-

market related categories in Google Trends—searches related to "Jobs" and "Welfare &

Unemployment"—and found a positive correlation.

Ginsberg et al. (2009) used search engine query data for the early detection of possible

influenza epidemics. The authors described the clear benefit of using Google data in research:

> Harnessing the collective intelligence of millions of users, Google Web search logs can
>
> provide one of the most timely, broad-reaching influenza monitoring systems available

today. Whereas traditional systems require 1-2 weeks to gather and process surveillance

data, our estimates are current each day. (Ginsberg, et al., 2009, p. 1014)

Inaccurate results of the original Google Flu system were eventually discovered, and these flaws

were discussed by Lazer, Kennedy, King, and Vespignani (2014). A corrected influenza model

was then presented by Yang, Santillana, and Kou (2015).

Askitas and Zimmermann (2009) investigated the potential of using Google data in

econometrics. The researchers conducted unemployment forecasting utilizing monthly German

data with Google data. The authors demonstrated strong correlations between keyword searches

and unemployment rates (Askitas & Zimmermann, 2009).

Hulth, Rydevik, and Linde (2009) showed further potential for the use of Web queries as

an accurate, cheap, and labor-extensive source for syndromic surveillance. They analyzed search

logs within a Swedish medical Web site during two influenza seasons and discussed how earlier

detection can lead to earlier interventions which help lower morbidity and mortality and help

with geographic containment.

Numerous other studies have looked at the utility of Web-based data in epidemiology.

Pelat et al. (2009) compared search trends based on a list of Google queries related to three

infectious diseases: influenza-like illness, gastroenteritis, and chickenpox. Wilson and

Brownstein (2009) also proposed using Internet surveillance tools to find search trends of

specific terms in assisting in the early detection of disease outbreaks. They found a search spike

for listeriosis nearly a month before the official outbreak announcement in Canada in 2008.

Brownstein, Freifeld, and Madoff (2009) investigated the peanut butter associated outbreak of

salmonella in 2008-2009 and discussed the potential of harnessing the Web for public health

surveillance. Finally, Seifter et al. (2010) used Google Trends to research lyme disease and seasonality predictions.

Soon after the potential of Google Trends was realized, Google Flu Trends was launched in 2008 to help predict impending influenza epidemics (Influenza, 2018). Following the success of Google Flu Trends, Google Correlate was created. Google Correlate is a generalization of Flu Trends that allows for automated query selection across millions of candidate queries for any temporal or spatial pattern of interest. Similar to Google Trends and Google's Insights for Search, Google Correlate is an online system and can surface its results in real time. The correlate tool currently provides two different databases:

- *us-weekly* (temporal only): weekly time series data for the United States at a national level

- *us-states* (spatial only): state-by-state series data for the United States summed across time

Google Correlate is like Google Trends in reverse in that a user can enter a data series and get back queries whose trend follows a similar pattern as the target (Google Correlate Tutorial, 2011). For example, if a researcher has a data set which can be broken down by state, uploading it to Google Correlate may give insight into some of the driving factors behind the data.

The objective of Google Correlate is to surface the queries in the database whose spatial or temporal pattern is most highly correlated (R^2) with a target pattern. Google Correlate employs a novel approximate nearest neighbor (ANN) algorithm over millions of candidate queries in an online search tree to produce results similar to the batch-based

approach employed by Google Flu Trends but in a fraction of a second. (Mohebbi et al., 2011, p. 2)

Researchers at Google have used the Correlate instrument to produce accurate models of influenza activity and home refinance rates in the United States (Mohebbi et al., 2011). The authors note that while Internet users do not represent a random sample of the United States population, this population has become increasingly less biased over time and now represents anywhere from 75% to 90% of the adult population. They suggest three prime benefits of modeling real-world activity using Web search data (Mohebbi et al., 2011):

1. It is timelier.

2. It has good temporal and spatial resolution.

3. It is relatively inexpensive compared to traditional data collection methods.

Developing countries are in especial peril as they face surveillance system problems like delay and loss of data (Strauss et al., 2016). Data researcher Stephens-Davidowitz (2017) proposed four unique powers of big data: (a) what typically constitutes as data can be reimagined to find new insights, (b) online data acts as a digital truth serum because people have no incentive to lie, (c) large pools of data can be zoomed in on to look at sub-populations, and (d) the Internet provides a vast laboratory where experiments can be conducted almost anywhere, anytime. The advantages of search engine data are further illustrated by Carriere-Swallow and Labbe (2013):

The delay in data releases of key macroeconomic variables presents a limitation for decision-makers by restricting their ability to accurately assess current conditions. These lag times make nowcasting—or the prediction of the present—an important practice.…The availability of data that would allow decision-makers to observe trends as

they unfold may improve the quality of economic assessments and, in turn, the decisions they inform. (p. 289)

Another huge advantage that Internet-based data have over traditional methods is in how tools like Google can help reveal implicit bias within surveys such as personal experience bias, self-report bias, and social desirability bias. Wilson and Brownstein (2009) also outline a few key advantages and disadvantages of Internet-based surveillance:

Advantages:

- Possibility of earlier detection of disease outbreaks than with use of traditional reporting mechanisms

- Does not require voluntary reporting on the part of governments or local officials

- The systems can provide information outside traditional communication channels

- Information is freely available

- Systems are relatively inexpensive to operate

- Systems can be automated, and the information can be disseminated in near real-time

- Potentially allows the public to have greater access to health surveillance information

Disadvantages:

- Information is often unstructured and difficult to interpret and requires advanced computational techniques to effectively implement

- The sensitivity is unclear, and the percentage of outbreaks that can be identified by these strategies needs to be identified

- The specificity is unclear, and a high false-positive rate could create workload issues because of the need for verification

- Availability of information to the public may create challenges in risk communication

- Privacy concerns for strategies that have the potential to identify individual Internet activity (Wilson & Brownstein, 2009, p. 830)

Vanderkam, Schonberger, Kumar, and Rowley (2011) presented asymmetric hashing as the technique used in Google Correlate and how it can be adapted to fit the specific needs of the product. Google Correlate "searches across millions of candidate query time series to find the best matches, returning results in less than 200 milliseconds. Its feature set and requirements present unique challenges for Approximate Nearest Neighbor (ANN) search techniques" (Vanderkam et al., 2011, p. 1).

In a pioneering study, Stephens-Davidowitz (2013a) examined three areas using evidence from Google data: (a) approximating the cost of racial animus on a black candidate, (b) predicting voter turnout, and (c) determining unreported victims of an economic downturn. In the first essay, Stephens-Davidowitz (2013a) found evidence supporting that "prejudice cost Obama 4.2 percentage points of the national popular vote in 2008 and 4.0 percentage points in 2012" (p. 5). If accurate, racism may have cost Obama significantly more votes than predicted by surveys. This finding diverges from other research such as the study conducted by Mas and Moretti (2008) who concluded that "racial attitudes did not play a major role in determining the outcome of the 2008 Presidential election" (p. 2).

Secondly, Stephens-Davidowitz (2013a) found that examining online searches for voting-related terms was a better proxy for predicting area-level turnout than traditional polls. He

showed that the change in search rates, compared to the previous election, for "vote" and "voting" in the month prior to an election is predictive of voter turnout.

> The theory that Google can capture changes in turnout intention over time is compelling: the marginal voter, the individual who only votes in certain elections, is likely to need information prior to voting.…The predictive power is little affected by controlling for changes in registration rates, early voting rates, or a state's having a Senate race, three other sources of information available prior to an election that might be used to predict turnout. (Stephens-Davidowitz, 2013a, pp. 42-43)

> Lastly, Stephens-Davidowitz (2013a) found evidence to help explain why recessions have

been shown to decrease the reporting rates of child maltreatment due to unreported cases and budget cuts. To overcome bias in reporting rates, the researcher used two alternative proxies for area-level maltreatment rates:

> [The] rates of child mortality from neglect and the fraction of Google searches that include the phrase 'child abuse' or 'child neglect'.…The motivation for the Google proxy is that it can capture community-level suspicion of child maltreatment, including many cases that are never actually reported. Both proxies comparatively *increased* in hard-hit areas. (Stephens-Davidowitz, 2013a, p. 65)

These results would suggest that the recession caused an increase in actual mistreatment despite a decrease in reported cases. Stephens-Davidowitz's work appears to be the first paper to suggest using Google to study crime, in this case, child abuse. Contrary to official data sources, his work showed that the previous economic downturn significantly increased child maltreatment in the United States.

Carriere-Swallow and Labbe (2013) proposed the use of Google Trends for predicting the present, termed nowcasting, by exploring the utility of observing Internet browsing habits to inform practitioners about aggregate consumer behavior in an emerging market. The simple theory is that Internet behavior correlates with consumer purchases in a market. Using Google search query data, the authors examined online interest in automobile purchases in Chile and tested whether it improved the fit and efficiency of nowcasting models for automobile sales.

> Our results show that models incorporating Google search results outperform competing benchmark specifications in both in- and out-of-sample nowcasting exercises, improving in-sample efficiency by up to 14%. The Google data have a number of characteristics that should make them particularly attractive to decision-makers in emerging markets: (i) they are derived directly from micro user data; (ii) they contain information on a large proportion of Internet users, which is a far more extensive sample than is commonly employed by surveying agencies; and (iii) they are released at high frequency and at regular intervals. (Carriere-Swallow & Labbe, 2013, p. 297)

While creating a framework for adaptive mobile interfaces, researchers found they needed the input of non-expert developers such as teachers to advise in the development of mobile-learning applications (Almeida, Orduna, Castillejo, Lopez-de-Ipina, & Sacristan, 2013). The researchers also needed to obtain mobile market data to generate the functions required for the educational tools development. They used Google Trends as a popularity metric to estimate the market of mobile devices since the data regarding the real sale volume for most mobile devices is unavailable and because popularity and value can change drastically over time and from one location to another. The proposed method allowed the model to state the market share in different periods of time as well as to localize the results to adapt them to diverse markets.

Fond, Gaman, Brunel, Haffen, and Llorca (2015) explored trends generated by keyword searches associated with suicide, depression, and bipolarity and found general trends that could be identified as indicators for use in suicide prevention policies. "Searches for depression keyword [*sic*] are correlated with those for suicide. However, bipolar disorder searches seem more impacted by media announcements, which we called the 'Zeta-Jones effect'" (Fond, Gaman, Brunel, Haffen, & Llorca, 2015, p. 917).

Saiz and Simonsohn (2008) proposed that the relative frequency of documents discussing a phenomenon can be proxied by the corresponding frequency of occurrence, and they considered how judgments made by large numbers of people aggregated into a single estimate are often remarkably accurate. The phenomenon of large groups making accurate judgments or predictions is often referred to and has been popularized as "the wisdom of crowds" as Surowiecki (2005) described in his titular work. Assuming that the more often a phenomenon occurs, the more likely somebody is to write about it, the researchers used the search engine Exalead and the newspaper data-bank Newsbank to show that document-frequency is correlated with the relative occurrence-frequency (Saiz & Simonsohn, 2008).

Rodriguez-Mazahua et al. (2015) explored implications for the enormous and growing amount of structured and unstructured data often referred to as big data. They specifically homed in on twelve domains: (a) Computer Science; (b) Engineering; (c) Mathematics; (d) Business, Management and Accounting; (e) Physics and Astronomy; (f) Biochemistry, Genetics and Molecular Biology; (g) Social Sciences; (h) Material Sciences; (i) Medicine; (j) Decision Sciences; (k) Multidisciplinary; and (l) Arts and Humanities. The researchers provided a comprehensive review of big data literature from 2010 to 2014 by analyzing and classifying 457 papers concerning big data.

The term of Big Data is mainly used to describe massive, heterogeneous, and often

unstructured digital content that is difficult to process using traditional data management

tools and techniques.…Big Data can be described using the 5V model: Volume (the era of

size), Velocity (the era of streaming data), Variety (the era of unstructured data), Value

(the era of cost associated with data), Veracity (the era of data pollution that needs

cleansing). (Rodriguez-Mazahua et al., 2015, p. 3075)

Goel, Hofman, Lahaie, Pennock, and Watts (2010) attempted to predict consumer

behavior based upon online search habits. They used the collective future behavior forecasting

to predict the opening weekend box-office revenue for feature films, the first-month sales of

video games, and the rank of songs on the Billboard Hot 100 chart. All cases found search

counts highly predictive of future outcomes, though song rank was less so.

Scheitle (2011) assessed the potential of Google's Insights for Search tool—the

predecessor of Google Trends—for use in social science research. He compared social

phenomena as defined by time and geography within search engine data with existing data

sources and found that the data sources corresponded quite closely. In particular, Scheitle (2011)

looked at existing measures of issue salience and religious adherence.

Kim et al. (2014) used large Web-based data to identify public interest and trends related

to endangered species. They used search log data from a six-year period for 246 endangered

species as determined by the Ministry of Environment of Korea. Essentially, the relative search

volumes for the species were correlated with the status of conservation practices. Kim et al.

(2014) found a positive relationship between relative search volume and the number of printed

media articles and a negative relationship between the length of the common name of a species

and the number of printed media articles. The authors then discussed the implications of using

such Web-based research to increase public and social community participation in effective conservation strategies for endangered species.

Brigo and Erro (2016), utilizing Eysenbach's terminology, conducted an infodemiological study of information-seeking behaviors to help answer the question "Why do people Google movement disorders?" Brigo and Erro collected daily Wikipedia article views in conjunction with the Google Trends service to examine peak traffic and to identify possible correlations with published news headlines. The highest peaks of searches were related to news reports about celebrities suffering from a movement disorder as well as specific mass-media events, news about pharmaceutical companies, and scientific discoveries on movement disorders.

Mellon (2014) used Google search data to measure issue salience, proposing that Internet search data are proxies for public opinion. Notably, the author assessed the content validity and criterion validity of the method against existing measures. Google search data were tested against Gallup's "most important problem" question, and four issues measured weekly in the United States were found to be valid proxies for public opinion when using search engine data: fuel prices, economy, immigration, and terrorism. Mellon (2014) began his method with 20 search indices that met the criteria for face validity. Then six indices were removed for lacking content validity, while eight out of the remaining 14 indices were adjusted for seasonality. Finally, nine more search indices were rejected because they could not demonstrate criterion validity, leaving five indices covering four issues.

> The reduction from 20 indices to five shows that simply assuming validity would have been misleading and have led to erroneous conclusions: If researchers use invalid measurements in research, they are not answering the questions they believe they are answering. Importantly, however, only one search index out of six was rejected at the

criterion validity testing stage, suggesting that the content validity analysis was successful in removing many time series that were not suitable measures of issue salience. The method also led to the successful measurement of four of the seven issues. (Mellon, 2014, p. 63)

By looking at the sharp increases in unemployment in Spain caused by economic crisis, Vicente et al. (2015) showed promising results in improving nowcasting and forecasting performance of economic statistics with Google Trends. Along similar economic lines, Naccarato et al. (2017) combined Google Trends data with official data to forecast the Italian youth unemployment rate.

Jun, Yoo, and Choi (2017) evaluated ten years' worth of research using Google Trends to describe how the scope of research has developed and expanded. The researchers conducted a network analysis of 657 research papers that had used Google Trends. The authors found that Google Trends has been used to analyze various variables within a wide range of fields such as information technology, communications, medicine, health, business, and economics. This trend in research shows a shift to attempt forecasting changes or predicting behavior, rather than simply describing and diagnosing social outcomes. Jun et al. (2017) provided insights for researchers who rely on various sources of big data to compare social trends and identify new areas for research. The authors described that their goal was

> to provide implications regarding research on the utilization and application of big data. In achieving this goal, Google Trends has fully demonstrated its advantages in terms of economy, immediacy, and objectivity, and there has been an expansion in research areas using this source.…In addition, compared to surveys, limitations such as cognitive dissonance and construal level theory are relatively less of a problem, and the objectivity

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is relatively high, since the number of users is close to that of the population. (Jun et al., 2017, p. 16)

At a minimum, researchers can conclude that Google Trends allows researchers to identify the current interests of searchers. Search activity seems most predictive in cases such as illness and purchases because these activities require immediacy. In areas where the motivation of search is more ambiguous, the search data are less helpful and may even cause statistical errors.

Pollett et al. (2017) studied Internet-based bio-surveillance methods for vector-borne diseases such as Zika, dengue, other arthropod-borne viruses, malaria, leishmaniasis, and lyme disease. Their work in digital epidemiology provides several key learning points including: (a) Web-based data streams can supplement traditional sentinel surveillance of diseases, (b) the accuracy of these surveillance systems varies, but spatial and temporal scales, disease burden, and seasonality are likely strong predictors, and (c) user-friendly, free platforms that combine digital and nondigital data streams are now available and enhance surveillance methods.

Regarding big data and leadership, Jones and Olken (2009) studied the effects of assassinations of national leaders on the politics, economics, and populations of their countries. Although the authors did not use Google data per se, they were still able to utilize a large online database to study the impact of leadership. The results showed that, on average, countries moved toward democracy after a successful assassination of a world leader autocrat. Assassinations also affected national and international conflicts, helping to resolve wars quicker. Results coincided with Jones and Olken's (2005) previous analysis of a self-obtained data set in which they found that the death of world leaders can directly impact the economic growth of a country.

Theoretical Foundations

Bronfenbrenner's (1979) ecological systems theory, also known as human ecology theory, is a developmental theory that considers a person's overlapping contexts of life to help explain his or her development and behavior. According to ecological systems theory, multiple environmental contexts overlap and influence the unique development of an individual (Bronfenbrenner, 1979; Woodside, Caldwell, & Spurr, 2006). Specifically, Bronfenbrenner proposed that five interrelated ecosystems (seen in Figure 2) extend from the individual self to create a complex map of their personhood.

1. Individual self: may include factors such as personal temperament and genetics.

2. Microsystem: immediate environment and personal relationships such as the nuclear family and close friends.

3. Mesosystem: the relationships between the various microsystems such as how one's parents and teachers may interact with each other.

4. Exosystem: the larger environmental context and other indirect influences such as how a parent's employment affects one's socioeconomic outcomes.

5. Macrosystem: the most distant relationships that may still exercise some influence of one's development such as cultural mores and beliefs.

6. Chronosystem: incorporates the permeating dimension of time and how one's age may impact different societal milestones such as a graduation or significant events like the loss of a loved one.

Ecological systems theory is an appropriate theoretical basis because this current study proposed that there are certain environmental circumstances, such as time of year and geographic location, that may influence a person's leadership interest. In terms of the different ecological

dimensions, this current study chiefly explored superficial facets of the exosystem and the chronosystem. Table 1 illustrates some of the other key theoretical foundations from which this current study was established:
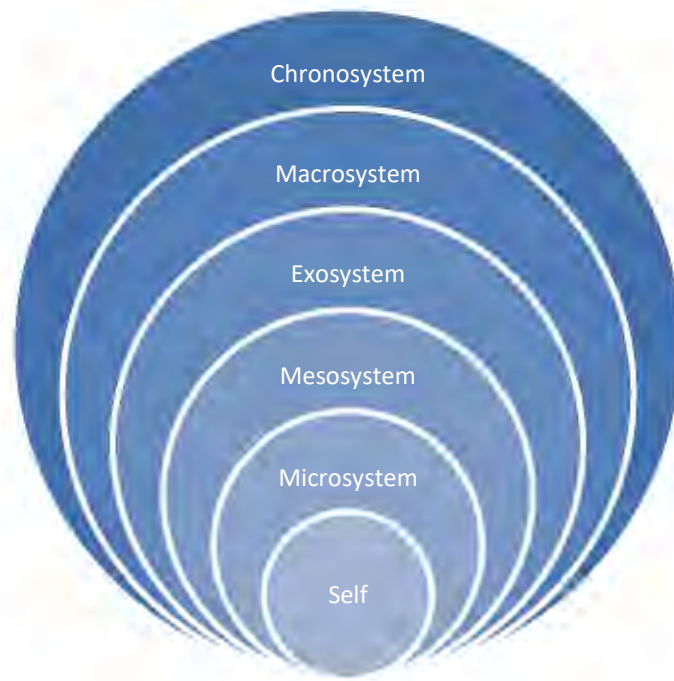
Figure 2. A model showing the overlapping layers of the ecological systems theory.

Table 1

Theoretical Foundations

Theory/Model/Framework	Progenitor/Reference
Biopsychosocial Model	George Engel (1977)
Multiple Intelligences Framework	Howard Gardner (2011)
Psychological-Type Theory	Carl Jung (1976)
Role-Motivation Theory	John Miner (1993)
Social Development Theory	Lev Vygotsky (1978)
Social Identity Theory	Henri Tajfel (1978)
Systems Theory	Ludwig von Bertalanffy (2015)
Systems Thinking of Learning Organizations	Peter Senge (2006)
Trait Theory	Gordon Allport (1961)

Conceptual Framework

Although not the purview of the current investigation, it is important to know that motivation is an important factor in leadership interest. What makes a person interested in leadership? What makes a person interested in anything for that matter? To answer these sorts of questions requires a degree of existential examination beyond the scope of this current study. If researchers assume that people's interests are founded in who they are, then deeper, murkier questions quickly arise such as: What forms a personality? and What makes people who they are? These questions are not easy to answer, if they are answerable at all. The central question of this current study was: By proxy of Google search behavior, what are observable characteristics of a person who is interested in leadership? In other words, are people from certain backgrounds or demographics more likely to be interested in leadership? Are certain temperaments or social classes more likely to be interested in one topic as opposed to another?

For example, Winter (2002) proposed three major motivations driving leadership pursuit:

1. Power – concern with having impact, control, or influence over others or the world

2. Achievement – concern with excellence

3. Affiliation – concern with establishing, maintaining, or restoring relations among people

Given these motives, Winter explained that many people may have a desire to lead but lack the requisite cognitive, emotional, and technical skills to lead well. Conversely, some people may have the sociopolitical skills to lead, and yet, they have little motivation to lead. Whatever the circumstances, Winter stated that this interplay between motivation and ability is crucial to good, healthy leadership. "The motives of leadership are a little like fire: they can

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cook our food and keep us warm, but they must always be controlled, trimmed back, and guarded—lest they burn and destroy our homes, our institutions, and ourselves" (p. 136).

Cohn and Moran (2011) composed a seminal text in reference to predicting leadership. The authors condensed two decades of research and experience into seven key indicators of what makes an effective leader. These indicators also doubled as predictors for good leadership when evaluating potential leadership applicants. The seven predictors were:

1. Integrity

2. Empathy

3. Emotional intelligence

4. Vision

5. Judgment

6. Courage

7. Passion

Essentially, Cohn and Moran (2011) contributed "an overall framework for making leadership selection decisions" (p. 7). The authors also distinguished between what they called leadership competencies, such as good communication and innovation, and the seven leadership attributes. The competencies were mostly learnable traits that ultimately are derived from the core seven attributes. As the authors noted, these competencies "focus more on what leaders *do* rather than the underlying attributes that allow them to do it" (p. 13).

To further explore why one might be interested in leadership, this literature review discussed several overlapping facets of what researchers have observed about human nature. However, a caveat is needed at this juncture. There is a gap in the literature regarding a person's journey from the initial interest in leadership, to the pursuit of leadership, to the obtained

position of leadership, and then to the final practice of leadership. Much of the leadership

scholarship focuses on the effectiveness of leadership and the traits of a good or bad leader

(Kotter, 2012; Kouzes & Posner, 2017; Northouse, 2016; Yukl, 2013). Therefore, when

considering the current study on leadership interest, a degree of reverse engineering was

warranted. This literature review formed an a posteriori argument to determine the

characteristics of and the factors influencing the pre- or proto-leader, meaning an individual who

shows an earlier inclination towards leadership or someone in the early stages of pursuing

leadership. Essentially, if established leaders are observed, then assumptions can be drawn that

those observed most likely held an interest in leadership before obtaining their position of

leadership. Researchers can then trace these leaders' characteristics back to find influences of

interest in the proto-leader. Based on the literature, this study developed a conceptual framework

(seen in Figure 3) for potential factors influencing an interest in leadership.
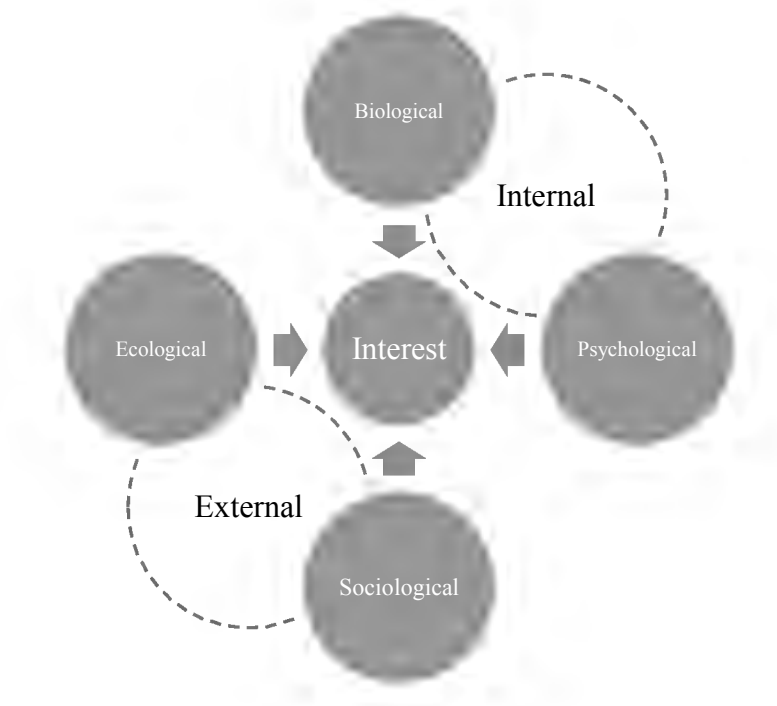
Figure 3. Conceptual framework for factors influencing a person's interests.

Biopsychosocial – Internal and External Influences

The conceptual framework shown in Figure 3 is built on the groundwork of the biopsychosocial model, which is a general framework for guiding theoretical and empirical pursuits first popularized by Engel (1977). Primarily, the biopsychosocial model is used to understand diseases as they relate to a person's biological, psychological, and social factors. Biological factors include genetics, biochemicals, and other physical traits. Psychological factors include personality, behavior, emotions, and mood. Social factors include culture, family relationships, community, and socioeconomic status. At the time, Engel (1977) was responding to and critiquing the more commonly used biomedical model in his field. He advocated the use of a new model that took a more holistic approach to diagnosing and caring for patients. The biopsychosocial model attempts to take into consideration the whole person—not just physiology—and how different factors play a role in the person's overall well-being. For example, the model looks at how a person's emotional resilience and family support structure may help him or her cope with a debilitating condition such as heart disease.

Though originally intended for the medical and psychiatric health fields, the model can be used in terms of causation to better understand human thinking and behavior in general. The biopsychosocial model is greatly influenced by systems theory (Bertalanffy, 2015), and the model emphasizes complex, hierarchical structures that flow on a continuum. The model opposes reductionist viewpoints, opting rather for an approach that recognizes that scenarios are most usefully understood at several levels, not just one (Engel, 1980). This philosophy stems from an understanding that people are themselves complex, and their choices are rarely reducible to simple, predictable patterns.

In developing an understanding of leadership interest, this literature review examined the biopsychosocial factors that may influence a person's interest in leadership. Beyond the biopsychosocial influences, this study also implements Bronfenbrenner's (1979) work to suggest that there is a fourth, unique sphere: ecology or environment. Unlike the social sphere factors which stem primarily from human relationships, the environmental factors stem from non-relational influences such as circumstantial opportunities. Ecological factors might include specific training, geographic climate, and unexpected life circumstances. Although the sociological sphere is closely related to the ecological sphere, this study distinguishes between the two. Therefore, the conceptual framework consists of four distinct spheres—two of which are internal influences, and two of which are external influences—which help to determine a person's interest in leadership. Although more general interests extend beyond the scope of this current study, it may also be proposed that this conceptual framework can apply to a person's interests in general, not just leadership.

Important to note is that these four spheres are not to be understood as rigid compartments. Rather, the spheres are interconnected and interrelated. They overlay and bleed together in a way that is not easy to separate. Humans are complex and must also be conceptualized in that complexity. Many of the resources used in the current literature review can readily fit in several categories. However, for the purposes of this study and for the sake of conciseness, the subsections to follow will be limited in discussion to certain, isolated themes. Future research may further define and describe the conceptual framework outlined in this current study, of which, from henceforth will be referred to as the bioecopsychosocial (BEPS) model.

Biological Factors – Innate and Acquired Abilities

In this review, biological factors primarily refer to those abilities often seen as either inborn or requiring targeted and recurring conditioning. Thus, physical attributes and forms of intelligence are included in this sphere. Although the lines between innate and acquired abilities can be blurry in terms of biology, this review positions them in the same section for conciseness and clarity. Additionally, gender is discussed later in terms of socialization norms and roles, rather than as a biological construct. Future refinement of the conceptual framework may provide for better distinguishing from the nature-versus-nurture aspects of a person's biology. Special attention is also given to the role of emotional intelligence.

For over four decades, *Bass and Stogdill's Handbook of Leadership* has been esteemed as an indispensable textbook for students of leadership. Stogdill (1974) composed the original work that Bass (2008) would later collaborate on and then expand on after Stogdill's passing. Among the many topics covered such as transformational leadership, technical skills, and ethics, the authors discussed the personal traits, tendencies, attributes, and values of leaders. Characteristics correlated with leadership emergence included an individual's level of cognitive ability, conscientiousness, self-confidence, energy/activity level, values, and tolerance for stress. The authors drew from numerous fields such as the social, political, and business sciences to break down the personal attributes of leaders and leadership and the process of learning leadership. On average, the person who occupies a position of leadership exceeds in intelligence, scholarship, dependability in exercising responsibilities, activity and social participation, and socioeconomic status. However, the qualities, characteristics, and skills of leaders are often determined by the demands of the situation that are placed on them. Other characteristics considered in the formation of leaders are philosophical ideologies,

competitiveness, self-esteem, and risk-taking (Bass, 2008). The authors also suggested a relationship between higher self-esteem and propensity for leadership.

Lord, De Vader, and Alliger (1986) conducted a meta-analysis to reexamine the relationship between personality traits and leadership emergence and perceptions. The authors contended that leadership traits better pertain to predicting leadership emergence rather than applying to leadership performance. Results supported the expectation that intelligence, gender norms, and dominance were significantly related to leadership perceptions. "In short, personality traits are associated with leadership perceptions to a higher degree and more consistently than the popular literature indicates" (p. 407).

Yukl (2013) observed that "One of the earliest approaches to studying leadership was the trait approach, which involved a search for traits and skills that predict whether a person will attain positions of leadership and be effective in these positions" (p. 139). The trait approach has been studied by many researchers with varying levels of both sophistication and success. Leadership development is a multibillion-dollar business. For example, researchers have investigated which traits and skills might predict whether a person will pursue a leadership career or emerge as an informal leader within a group (Lord et al., 1986; Stogdill, 1974). Synthesizing these various studies, Yukl (2013) described several traits that appear to be related to potential leaders and leadership effectiveness:

- High energy level and stress tolerance

- Moderately high self-confidence

- Internal locus of control

- Emotional stability and maturity

- Personal integrity

- Socialized power motivation

- Moderately high achievement orientation

- Moderately low need for affiliation

However, the author also noted that traits research has been shown to be weak in finding strong and consistent correlations with leadership outcomes due to such factors as a lack of attention given to situational variables and the complications of relational interactions among leaders and followers.

Bray, Campbell, and Grant (1974) conducted a groundbreaking and widely-known, longitudinal research project in the 1950s on leadership aspirations, motivations, and abilities with the American Telephone & Telegraph (AT&T) company. The authors produced a major report from the Management Progress Study on the life of managers in the Bell System. The findings were based on analyses of data obtained by methods including management games, tests, interviews, and questionnaires. Data were collected on managers at different points in time to determine if assessments completed early in a manager's career were valid predictors of performance years later.

For example, when recruits were rated on 25 presumed managerial qualities to predict which individuals would reach third level management within ten years, early success was predicted in 40% of cases. The correctly predicted leaders tended to fit certain popular stereotypes of young businessmen who were "eager to get ahead, willing to work hard, yet interested in security and not very independent. They looked to the future with highly favorable expectations—the company would be a fine place to work, and they would succeed in it" (p. 46). Also, 64% of overall predicted leaders reached management while only 32% not predicted reached management. For the researchers, these results meant that "It is possible to improve

substantially on the selections made by ordinary college recruiting processes. It also means that personal characteristics displayed on the day of employment are definitely related to later success" (p. 70). The results also indicated the importance of early selection because "The average recruit did not improve in his management abilities, even after eight years on the job" (p. 186).

Twenty years after the AT&T study began, Howard and Bray (1988) continued to find indicators of leadership strengths and weaknesses as well as predictors for performance. The researchers' ongoing investigation specifically looked at the question of which is more important: selection or development? This research helped promote the concept that early aspirations and abilities in leadership help to predict future leadership and management success. Results found predictive measures for two types in particular: high-potential managers and well-adjusted managers. "The high-potential candidates apparently looked beyond the company in terms of furthering their careers, while the well-adjusted persons were more concerned with loyalty to and identification with their current employer" (p. 389).

Genes have also been argued to play a role in leadership development (Bass, 1997; Rose, 1995). Rose (1995) explored genetics and human behavior, both the pros and cons of such a pursuit, and how these ambitions may interact with concepts such as leadership. The researcher pointed out that the direct and simple explanations for human behavior offered by behavioral genetics are quite alluring for many researchers. The controversy is in its oversimplification of complex social phenomena and a fear of revived eugenics. Genetics may play a role in leadership interest, but the research is inconclusive, and what is more, it seems difficult to decipher exactly how genetics matter and to what extent (Rose, 1995).

Atwater, Dionne, Avolio, Camobreco, and Lau (1999) conducted a longitudinal study to track leadership development in male cadets at an unspecified military college from matriculation through graduation. The researchers "tracked changes in individual characteristics as well as assessed the extent to which leader emergence and effectiveness could be predicted by individual characteristics assessed early in an individual's development" (Atwater et al., 1999, p. 1544). The qualities cited were cognitive ability, conscientiousness, self-esteem, hardiness, moral reasoning, physical fitness, prior influence experiences, and scores on a leader potential index. Among these qualities, "physical fitness and prior influence experiences were predictive of leader effectiveness. Cognitive ability, physical fitness, prior influence experiences, and self-esteem were relevant to predicting leader emergence" (Atwater et al., 1999, p. 1557). Overall, the study demonstrated predictive measures for leadership effectiveness and emergence based upon individual traits.

Taylor, Taylor, and Stoller (2008) conducted an exploratory study among physicians to better understand the perceived leadership needs of aspiring and established leaders. The researchers used a qualitative, inductive, and structured interview-based design to examine a purposeful sample of current and aspiring leaders from which four themes emerged: knowledge, emotional intelligence, vision, and organizational altruism—all deemed as essential characteristics to the success of aspiring leaders. Although within the specific context of health care, the researchers' findings corroborated what are commonly regarded as leadership competencies (Bass, 2008; Senge, 2006). The researchers recommended that leadership training programs should reduce formal didactics in favor of curricula that include emotional intelligence competencies as well as more interactive and problem-based learning scenarios (Taylor et al., 2008).

Regarding the construct of leadership, the views of participants in the Taylor et al. (2008) study contained two components: "the first being knowledge and skills and the second being personal attributes that may be considered innate, or at least learned early in development" (p. 751). This construct reinforces the idea that many leaders are not just taught how to lead but are in some way born with certain leadership tendencies. Qualities and competencies cited as innate included charisma, vision, energy, caring, and empathy. Qualities and competencies cited as teachable included strategies for dealing with groups, knowledge of finances and regulations, knowledge of organizational priorities, networking, and planning skills (Taylor et al., 2008).

Creativity, conceptualized as a "confluence of personal attributes" (Matthew, 2009, p. 30), was found to be a predictor for leading change in an organization, specifically for both novices and early- to mid-career Army officers. Though less influential than creativity, social-emotional competency was also a significant predictor. Creativity is essentially understood as problem-solving—generating new knowledge from past experiences or applying skills in combined ways. "Leadership is indisputably a multidimensional phenomenon" (Matthew, 2009, p. 31).

Sosik and Megerian (1999) indicated correlations between the self-awareness of managers and their emotional intelligence, leader behavior, and performance. Based on the study, self-awareness appears to be a foundation of effective leadership. Leaders categorized as self-aware by subordinate ratings on transformational leadership behavior were positively related to having qualities such as purpose in life, personal efficacy, interpersonal control, and social self-confidence (Sosik & Megerian, 1999). Furthermore, a person's public self-consciousness led to mixed results as related to self-estimations. Participants labeled as over-estimators were often publicly self-conscious—who "play the game"—and they were looked upon favorably by

superiors for adhering to established norms (p. 386). However, these "fast-track" candidates are often seen by subordinates as self-serving, duplicitous, and uncaring (p. 386).

Competency assessments rather than intelligence tests may be more predictive for later occupational success, especially among high-level executives (McClelland, 1998). Still yet, general cognitive ability and conscientiousness are attributes related to team effectiveness in decision making (LePine, Hollenbeck, Ilgen, & Hedlund, 1997). The interactions and dynamics of a group or team can impact the leader and vice versa. Individual differences, as well as the specific task, influence team performance.

However, Fox and Spector (2000) found that general intelligence is only one factor important for interview success. General intelligence, practical intelligence, positive affectivity, empathy, and non-verbal behavior all played a role in persuading interviewers (Fox & Spector, 2000). Extending even further beyond the notion of general intelligence is the concept of multiple intelligences. Popularized by Gardner (2011), the theory of multiple intelligences comprises of eight or more distinct intelligences, including linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, and naturalistic.

In terms of different kinds of intelligence, one area perhaps deserving more attention is emotional intelligence. Studies have suggested that emotional intelligence is one of the most often cited qualities admired in leaders (Law, Wong, & Song, 2004; Taylor et al., 2008). Law et al. (2004) defined emotional intelligence as "a four-dimensional construct, comprising the ability to understand one's own and others' emotions, to regulate one's emotions, and to use one's emotions" (p. 494). When understood as a set of abilities, this definition distinguishes emotional intelligence from personality traits and behavioral preferences.

One of the most common methods for assessing emotional intelligence is the Bar-On Emotional Quotient Inventory (EQ-i) (Bar-On, 2004). This self-report approach to assessing emotionally and socially intelligent behavior was utilized by Stein et al. (2009) to examine the emotional intelligence scores of two high-profile executive groups in comparison with the general population. The researchers also investigated how the executive group's scores related to various organizational outcomes such as profit, growth, and employee retention. The EQ-i was administered to a sample of 186 executives, and the results showed that top executives differed significantly from the normative population. "Findings showed that executives tend to have a different EI composition from the rest of the population and use a variety of EI skills in order to meet the challenges that they may face" (Stein et al., 2009, p. 97).

The researchers continued the ongoing interest in the relationship between emotional intelligence and leadership. The results of the Stein et al. (2009) study support the notion that high emotional intelligence skills are present in leaders. In comparison to the general population, aspiring leaders may expect to score higher in the areas of intrapersonal skills, general mood, and adaptability, as well as empathy, self-regard, reality testing, and problem-solving. Interestingly, the executive group scored significantly lower than the general population on the subscales of social responsibility and impulse control (Stein et al., 2009), which disagrees with other findings (Knutson & Miranda, 2000; Knutson, Miranda, & Washell, 2005).

At the individual level, emotional intelligence can facilitate social adaptation and learning. At the organizational level, emotional capability can facilitate radical change (Huy, 1999). Again, emotional intelligence is related to but also distinct from personality. Furthermore, emotional intelligence appears to have predictive capabilities of life satisfaction and job performance ratings (Law et al., 2004).

Research has shown that training in emotional intelligence can improve stress management and overall health and work performance (Slaski & Cartwright, 2003). Furthermore, Van Rooy and Viswesvaran (2004) examined 69 independent studies to measure the relationship between emotional intelligence and performance outcomes. The correlation between emotional intelligence and performance ($p = .23$) was not as high as one may have thought, but still higher than other selection methods such as letters of reference and may even be a better predictor than personality alone (Van Rooy & Viswesvaran, 2004).

Psychological Factors – Personality Profile

Using personality profiling, psychological factors influencing an interest in leadership are probably the most heavily studied. In this review, psychological factors primarily refer to traits associated with personality. Thus, emotions, mood, and temperament are included in this sphere.

Garcia, Duncan, Carmody-Bubb, and Ree (2014) utilized the prevalent Big Five Personality Traits (Daft, 2018; Digman, 1990) and the Full Range Leadership Model (Bass & Avolio, 1997, 2000) to study the relationship between perceived personality traits and leadership styles. The Big Five profiles a person's personality on a spectrum of openness, conscientiousness, extroversion, agreeableness, and neuroticism (OCEAN). The Full Range Leadership Model distinguishes between transformational, transactional, and passive-avoidant leadership styles. The researchers based the study on followers' perceptions and found that the personality and leadership style projected by principals impacted teachers' perceptions. Extroversion was not a strong predictor of leadership style. Both openness and emotional stability were equated to both transformational and transactional leaders. Agreeableness was linked to transformational leaders as well. Participants rated high on conscientiousness and emotional instability were perceived as passive-avoidant leaders.

The most frequent predictor for the entire Full Range Leadership Model was Neuroticism. The more Emotionally Stable and more active the teachers/paraprofessionals perceived the principals, the more Transformational and Transactional they rated the principal. The more Emotionally Unstable the teachers/paraprofessionals perceived the principals, the more Passive-Avoidant they rated the principal. Openness was the second most frequent predictor of both Transformational and Transactional Leadership. The more imaginative, had excellent ideas the teachers/paraprofessionals perceived the principals, the more Transformational and Transactional they rated the principal. (Garcia et al., 2014, p. 209)

Psychological-type theory, commonly attributed to Jung (1976), further provides an interesting framework for assessing the personality profile of leaders.

According to psychological-type theory, there are four indices on which individual differences can be assessed. Two orientations, styled introversion and extraversion, are concerned with where energy is drawn from. The two perceiving functions, sensing and intuition, are concerned with how information is gathered. The two judging functions, feeling and thinking, relate to how decisions are made. The two attitudes toward the outer world, judging and perceiving, address how a person prefers to deal with the outer world. (Powell, Robbins, & Francis, 2012, pp. 905-906)

A common method for indicating psychological type is the Myers-Briggs Type Indicator (Briggs Myers & Myers, 1995; Myers, 1998). The mother and daughter team of Katherine Briggs and Isabel Briggs Myers developed and refined Jung's initial theories into a practical self-report instrument for indicating psychological types. Another common instrument used in determining psychological type, especially within the religious context, is the Francis

Psychological-Type Scale (Francis, 2005a). Both instruments utilize the same four paired

indices in defining psychological type, although differing theories will emphasize different

aspects of each personality trait. The eight indices, along with their corresponding abbreviations,

can be seen in Table 2.

Table 2

Myers-Briggs Type Indicator

Index	Abbreviation
Extroversion	E
Introversion	I
Intuitive	N
Sensing	S
Feeling	F
Thinking	T
Judging	J
Perceiving	P

The first pair, extroversion (E) and introversion (I), mainly refers to the orientation in

which a person derives their energy. A person may feel more energized by being in a social

setting in which case he or she is more extroverted. Conversely, a person may feel more

energized by having a time of solitude, in which case he or she is more introverted. The second

pair, intuitive (N) and sensing (S), mainly refers to the way in which a person perceives or learns

about the world. A person who is more contemplative about the world is more intuitive. For

example, this person might ponder and admire the ocean from the shore to better understand it.

In contrast, a person who experiences the world tangibly is described as more sensory. This

person would rather learn about the ocean by jumping in it. The third pair, feeling (F) and

thinking (T), mainly refers to the way decisions are made. Someone who decides to wait until

the next day to go to the grocery store for milk because he or she is tired is more of a feeler. The person who decides to get the milk that evening because he or she needs it for breakfast the next day may be described as more of a thinker. Finally, the fourth pair, judging (J) and perceiving (P), mainly refers to the way people prefer to organize their life. A person who likes to keep detailed plans and schedules would be considered more on the judging spectrum. The person who prefers to live spontaneously and not commit to any prior engagement would be considered more on the perceiving spectrum. All together, these four pairs are combined to create 16 unique personality profiles commonly represented by using initials such as ENFP or ISTJ. Often, the literature communicates that a person tends to have a preferred style or personality type. Here, the use of the term prefer does not necessarily indicate a personal preference. Rather, prefer, is to indicate that a person's personality type is on a spectrum (Francis, 2005a). Therefore, even though two people may both be described as having the same personality type, they may display those types in very different ways. To clarify, if a person is said to prefer thinking, this preference does not mean that he or she does not also have feeling attributes.

Much of the literature on personality and leadership focuses on the interplay between personality type and religious leadership (Francis, 2005a; Oswald & Kroeger, 2014). Within this realm, researcher Leslie Francis has contributed much to the discussion. Francis (2005a) looked at the interaction of faith and psychology within the individual and the Church as a whole. When discussing personality types of church leaders and clergy, the overall observation was that leaders can display all the many different personality types. Although, research also indicated that different denominations and specific church cultures do tend to attract more leaders of certain personality types than others. For example, the ISFJ type was most prevalent for male clergy in the Church in Wales, which was an appropriate type given an ISFJ's tendency to lend

stability, devotion, loyalty, conscientiousness, and responsibility. "While no one psychological type preference is clearly the best fit for ministry, different type preferences are likely to be better for different churches" (p. 109).

Francis has also collaborated on a series of studies with other scholars. For instance, male evangelical church leaders were found to more likely possess either the ESFJ or ISFJ personality type (Francis & Robbins, 2002).

> Leaders with these personality characteristics bring clear strengths to pastoral ministry. They are individuals who prize order, structure, and discipline in their outer lives. They have warm pastoral hearts and a keen eye for detail and for the material context in which they conduct their ministry. They are likely to respect the tradition to which they belong and to love the people whom they are called to serve. (Francis & Robbins, 2002, p. 219)

Using the Myers-Briggs Type Indicator, the psychological types of male missionary personnel training in England were found to be predominantly either ESTJ (24%) and ISTJ (15%) (Craig, Horsfall, & Francis, 2005). In contrast, Christian youth workers were more likely to embody the very different ENFJ type (Francis, Nash, Nash, & Craig, 2007).

Using the Francis Psychological-Type Scales, differences based on gender were evaluated among church leaders in the United Kingdom (Craig, Francis, & Robbins, 2004). Female church leaders preferred ESFJ, and male church leaders preferred ISTJ. This study also supported the often-observed preferences for sensing and judging among both clergy and laity (Craig et al., 2004). The same team later examined the psychological-type profile of Anglican churchgoers, showing women leaning towards either ESFJ or ISFJ and men leaning towards ISTJ (Francis, Robbins, & Craig, 2011).

Psychological types of male and female evangelical lay church leaders in England were compared with the United Kingdom population norms (Francis, 2005b). Female leaders preferred either ESFJ or ISFJ, and male leaders preferred INTJ. Interestingly, among evangelical lay church leaders, intuitive types were significantly over-represented compared to the United Kingdom population norms (Francis, 2005b).

Using the Myers-Briggs Type Indicator, psychological-type preferences of Roman Catholic priests in the United Kingdom were shown to be introversion over extroversion, feeling over thinking, and judging over perceiving (Craig, Duncan, & Francis, 2006b). Sensing and intuition were near equal, but a clear preference for feeling and judging arose among ordained clergy (Craig et al., 2006b). Another study found a similar yet also distinct finding among Roman Catholic priests who preferred either ISFJ or ISTJ, with 27% profiled as ISTJ compared to 16% of the general population (Burns, Francis, Village, & Robbins, 2013).

Psychological-type preferences of male vergers in the Church of England were evaluated using the Myers-Briggs Type Indicator (Craig, Duncan, & Francis, 2006a). Vergers tended to prefer introversion over extroversion, sensing over intuition, thinking over feeling, and judging over perceiving for a profile type of ISTJ (Craig et al., 2006a). Women priests, on the other hand, seem to prefer INFJ (Francis, Robbins, & Whinney, 2011).

Another study looked at the profile of 626 Church of England clergymen, finding an overall preference for INTJ, INFJ, and ISTJ types (Francis, Craig, Whinney, Tilley, & Slater, 2007). These types see clergymen as comprising significantly higher proportions of intuitive types, feeling types, and judging types when compared with the United Kingdom general population (Francis, Craig, et al., 2007). A notable finding was the higher rate of intuition types among clergy compared to their congregations (Francis, Craig, et al., 2007). This difference may

be due to intuitive types being more proactive in terms of change and development, while sensing types among the average churchgoer desire consistency and stability.

The relationship between work-related psychological health and psychological type among clergy serving in the Presbyterian Church (USA) was evaluated to show clergy preferring INFJ (Francis, Wulff, & Robbins, 2008). The researchers also found work-related stress was higher among these introverted clergies, which is consistent with the theory that the extroverted nature of ministry is more taxing for introverted clergy, causing a loss of energy and mental rewards (Francis et al., 2008).

However, these results are incongruous with other findings (Francis, Robbins, Kaldor, & Castle, 2009). The researchers evaluated the psychological type and work-related psychological health among clergy in Australia, England, and New Zealand. In general, clergy preferred ISFJ, and clergy who preferred introversion and thinking experienced lower levels of work-related psychological health than clergy who preferred extroversion and feeling (Francis, Robbins, et al., 2009). In contrast to the Francis et al. (2008) study, this finding would suggest that introverted, thinking types are able to center themselves and find spaces of peace to combat stress.

Using the Francis Psychological-Type Scales, the psychological-type profile of lead elders within the Newfrontiers network of churches in the United Kingdom were examined (Francis, Gubb, et al., 2009). Within the Newfrontiers leadership, the most frequently reported types were ISTJ (16%) and ESTJ (13%), while among Church of England clergymen the most frequently reported types were INTJ (11%) and ISTJ (10%) (Francis, Gubb, et al., 2009). Then, Francis, Robbins, et al. (2012) compared this earlier data to test the relationship between lead elders and the wider leadership team. The researchers found that the larger leadership teams

reflected rather than complemented the strengths of the lead elders. The leaders showed a

preference for ESTJ (Francis et al., 2012).

Powell et al. (2012) examined the psychological-type profiles of 845 lay church leaders

from a range of 24 different denominations and movements in Australia. Participants completed

the Francis Psychological-Type Scales (Francis, 2005a) within the context of the 2006 Australian

National Church Life Survey. The profiles of these church leaders were almost identical to the

type profiles of 1,527 Australian churchgoers.

> The predominant types among female lay church leaders were ISFJ (21%), ESFJ (21%),
>
> and ISTJ (18%). The predominant types among male lay church leaders were ISTJ
>
> (28%), ISFJ (17%), ESTJ (13%), and ESFJ (12%). The SJ temperament accounted for
>
> 67% of the female lay church leaders and for 70% of the male lay church leaders. (Powell
>
> et al., 2012, p. 905)

Studying lay church leaders can present an interesting opportunity to better understand

aspiring leaders because this group contributes voluntarily. Lay leaders help maintain and

develop church life over time often beyond paid clergy. "They hold positions of influence and

can shape the cultural style and ministry directions of a local church—either formally or

informally" (Powell et al., 2012, p. 909). The researchers drew three main conclusions from the

data. First, the psychological-type profiles of lay church leaders reflected the congregations

from which they were drawn, and such compatibility offers both potential strengths and potential

weaknesses. Second, the two types ISFJ and ISTJ were strongly represented among these

leaders. Third, sensing and judging attributes were especially evident. The research suggested

that a disparity exists between professional clergy and lay church leaders.

While the professional clergy may wish to lead their churches to try new things and to run the risk of adventure, the SJ preferences of the lay church leaders may collude with the church congregations to prefer a more familiar and more conventional approach to church life. (Powell et al., 2012, p. 916)

Overall, based on the personality profiles of religious leaders, the studies conducted by Francis and others suggest that church leaders are more likely to have sensing and judging personality traits as well as a stronger tendency towards introversion. Caution is needed here, however, because there is no simple explanation or profile for a leader. All profile types embody leadership qualities, and different leaders can utilize the different strengths and weaknesses of each type. What appears more important than personality style is the context in which that style is situated, or the capacity to adapt one's style to a different demand and circumstance (Cohn & Moran, 2011).

The other reason that personality is a bit of a thorny issue is that personality type is not an accurate predictor of leadership potential….A misconception continues to persist that individuals with a charismatic personality, for example, are more likely to be effective leaders than those who have a more taciturn or reserved personality. But research does not support this conclusion. (Cohn & Moran, 2011, p. 205)

Moving beyond the religious context, Litzenberg and Schneider (1989) provided 74 characteristics of agribusiness leaders. Top U.S. agribusiness executives from 543 firms ranked qualities important for future leaders. These executives identified interpersonal skills such as self-motivation, positive work attitude, and high ethical standards as the most important for success. Communication skills and business skills were also seen as highly essential. Although

still rated as important, technical skills were viewed as the least vital (Litzenberg & Schneider, 1989).

Nowell and Harrison (2010) investigated how collaborative partnerships and leadership facilitate capacity-building in the field of public health. The researchers compared prominent leaders in three regional health partnerships, looking at informal leadership when no one is officially in charge, the roles those leaders play, and the specific characteristics that enable those roles. As in other studies, attributes such as passion, knowledge, and leadership skills were deemed important. However, the most prominent capacities noted were rooted in the specific organizational context that the leader was in (Nowell & Harrison, 2010).

Other traits removed from the personality profile models have also shown to be related to leadership predictions (Rubin, Munz, & Bommer, 2005). Emotion recognition, positive affectivity, and agreeableness have positively predicted for transformational leadership behavior (Rubin et al., 2005).

First, leaders with high positive affect were more likely to perform transformational leadership behavior but not more or less likely to engage in contingent reward behavior. Second, results showed that agreeableness, but not extroversion, predicted transformational leadership behavior and contingent reward behavior. (Rubin et al., 2005, p. 853)

Overall, based on the literature regarding psychological factors, the research does not indicate a clear pattern of whether certain personality types are more likely than others to be interested in leadership based purely on a personality profile. Despite massive research efforts over the years, results have often been either contradictory or simply inconclusive (Yukl, 2013). Certain overlapping attributes may be predictive of leadership interest such as interpersonal skills

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and a generally optimistic demeanor. Ultimately, leaders, and those interested in leadership, cover a diverse range of personality types.

Sociological Factors – Culture

In this review, sociological factors primarily refer to external influences deriving from social relationships. Much of the sociological factors can be understood in light of Vygotsky's (1978) social development theory or sociocultural theory of cognitive development. Vygotsky's concepts of the zone of proximal development and scaffolding are relevant here. Thus, community, culture, and societal expectations are included in this third sphere. Special attention is also given to the role gender socialization plays.

Bass (1997) described leadership as a "universal phenomenon" (p. 130), and while leadership may be generalizable, it is also contextual. Culture, both within the specific organization and the greater society, influences the concepts and practices of leadership and interpersonal behavior (Bass, 1997). The GLOBE Project (Global Leadership and Organizational Behavior Effectiveness Project), for example, is an ongoing research project studying leadership values, beliefs, and practices among dozens of nations and cultures (GLOBE, 2016). As Cohn and Moran (2011) described,

> Where and how we are raised affects the way we think and behave. Some cultures and groups encourage expression; others discourage it. Some embrace competition and celebrate individual achievement; others are more collectivistic. Even within a particular culture, context takes the raw material of our inheritance and gives it texture, form, and shape. (p. 191)

Knutson and Miranda (2000) explored the relationship between leaders in learning organizations and social interest. "Social interest seems to be a catalyst for the leadership roles

needed in the learning organization….Social interest complements many of the characteristics of the learning organization and its leadership" (Knutson & Miranda, 2000, p. 207). The authors noted that leaders are often conceptualized as designers, teachers, and stewards.

Knutson et al. (2005) conducted an empirical evaluation of the theoretical position proposed by Knutson and Miranda (2000) that leaders in learning organizations exhibit social interest. The authors collected data from a convenience sample of 70 principals and 219 teachers. The authors examined the relationships between leadership, social interest, and school culture. The results revealed a relationship between social interest and leaders. Type of organization was not found to be statistically significant. "The results indicate a link between leadership social interest and the factor that identifies the use of peer reviews and the provision of feedback based on observing each other's classroom behaviors to increase individual and organizational capacity" (Knutson at el., 2005, p. 32). Furthermore, the findings supported the belief that school leaders can stimulate a culture in which "the teachers' behaviors, beliefs, and attitudes facilitate continuous learning" (Knutson et al., 2005, p. 33).

Social motivation is a huge driver of human behavior. Power motivation refers to a desire to influence others (McClelland, 1998; Miner, 1978). So, the stronger the power motivation, the stronger the desire to lead. "Therefore, power-motivated individuals should possess stronger aspirations for leadership positions and should show more effort and investments to acquire skills and qualifications that enable them to attain these positions" (Hernandez Bark et al., 2016, p. 475). These individuals may seek out the opportunities and the social relationships more.

Meindl, Ehrlich, and Dukerich (1985) explored the concept of leadership in relation to the collective consciousness and commitment of society. They looked at the popular press,

dissertations, and general business periodicals. The authors suggested an association between: (a) very good or very bad work performances and firm emphasis on leadership, (b) economic downturns and the interest of leadership among scholars, and (c) economic upswings and interest in leadership by the general business community (Meindl et al., 1985). As people attempt to make sense of life, constructs such as leadership take on a romanticized, mythological role. Society often desires neat, cause-and-effect patterns that can be understood or at least thought to be understood. Thus, groups desire leaders who will lead them to status and success. The collective consciousness of society has sought to understand and improve organizations to the point that "The social construction of organizational realities has elevated the concept of leadership to a lofty status and level of significance" (Meindl et al., 1985, p. 78).

Ultimately, Meindl et al. (1985) took a rather pessimistic view on society's preoccupation with leadership, stating that "the significance placed on leadership is a response to the ill-structured problem of comprehending the causal structure of complex, organized systems" (p. 79). They found that when people are faced with large outcomes—either positive or negative—such as an economic boom or bust, the observers are likely to infer that a leader was the main, driving cause. They continue,

> The romanticized conception of leadership results from a biased preference to understand important but causally indeterminant and ambiguous organizational events and occurrences in terms of leadership. Accordingly, in the absence of direct, unambiguous information that would allow one rationally to infer the locus of causality, the romanticized conception of leadership permits us to be more comfortable in associating leaders—by ascribing to them control and responsibility—with events and outcomes to which they can be plausibly linked. (Meindl et al., 1985, p. 80)

Other theories associated with leadership construction include role-motivation theory (Miner, 1978) and social identity theory (Tajfel & Turner, 1979; Hogg, 2001). Miner (1978) reviewed various hypotheses and found support for managerial role-motivation theory, which describes the managerial work in near-universal patterns that transcend culture. He described at least six role prescriptions and motivational patterns: (a) managers behave in ways that do not provoke negative reactions from superiors, (b) strong competitiveness exists, (c) managers are to be decisive, (d) managers must discipline and direct behavior of subordinates, (e) the position requires high visibility and thus vulnerability, and (f) routine administrative requirements are unavoidable (Miner, Twenty years of research on role-motivation theory of managerial effectiveness, 1978).

Hogg (2001) advocated for the social identity theory of leadership, meaning that leadership is a group process created by social categorization and prototype-based social identities. A reinforcing cycle or feedback loop is created when members cognitively and behaviorally conform to social norms and the prototype classifications. For example, a charismatic personality will be credited influence which further empowers his or her status and reinforces the statuses of all members (Hogg, 2001). The social identity theory of leadership views social categorization and depersonalization processes associated with social identity as the major influencer of leadership conceptualization. This depersonalization along with the behavior of followers plays a critical role in forming the conceptual prototype leader. The author stated that social constructs often do several things: (a) imbue individuals with charisma and empower them as leaders, (b) create a status differential between the leader and the followers, and (c) facilitate conditions that are conducive to abuses of power.

Rudman and Fairchild (2004) also contributed to this idea of a self-fulfilling prophecy in society and leadership. Essentially, social groups will "conspire to maintain stereotypes by policing others and themselves in order to preserve the social order" (p. 173). The consequences of the social order are that the stereotypes are reinforced, and nonconformists are rejected or ostracized.

Barnes (2016) investigated the impact of service learning on student nurses' level of leadership and interest in social justice. The results showed a small increase in perceived leadership skills and social justice interest.

In terms of societal norms and cultural expectations, perhaps no topic is more salient than that of gender equality. Of increasing interest is research into gender diversity in leadership (Damousi, Rubenstein, & Tomsic, 2014). For example, Wolbrecht and Campbell (2007) looked at what difference was made when female members of Parliament acted as political role models. Essentially, the presence of more female political leaders in an area was related to an increase in adolescent girls' political discussion and engagement (Wolbrecht & Campbell, 2007).

Hunt, Gonsalkorale, and Zadro (2014) investigated the impact that observing female leadership has on the political and leadership aspirations of those observers. Specifically, the researchers looked at female and male reactions to gender-based criticism directed towards Australia's first female prime minister, Julia Gillard. Female participants completed the Conformity to Feminine Norms Inventory (CFNI) (Mahalik et al., 2005), and male participants completed the Conformity to Masculine Norms Inventory (CMNI) (Mahalik et al., 2003). These inventories were used to assess the degree to which participants "attempt to conform to the dominant contemporary Western gender norms for their respective gender" (Hunt et al., 2014, p. 725). Based on 167 Australian undergraduate students' measures of conformity to gender norms,

results showed that female participants who scored high on conformity to feminine norms displayed a lower desire to be involved in politics after reading about Gillard's gender-based difficulties, while low conformers showed a greater desire to be involved in politics.

Hunt et al. (2014) discussed the potential "role-model" effect that female leaders have in inspiring other young women to pursue leadership roles (p. 723). However, this effect may be diluted due to traditional gender role norms. Therefore, the researchers inquired as to whether a successful female leader being criticized on the grounds of gender would result in motivating females to pursue leadership, termed a "role-model" effect, or demotivate females, termed a "backlash-by-proxy" effect in others (p. 723).

> Female participants either read a series of statements about the difficulties that Gillard faced, with deliberate attention drawn to sexism she encountered, or generic statements about difficulties leaders face. Participants' interest in a political career and belief in their own leadership capabilities were then examined. (Hunt et al., 2014, p. 724)

The results of their study confirmed that the effect of leadership, in this case, female leadership, on observers is complicated (Hunt et al., 2014). Evidence suggested women who were high on conformity to feminine norms avoided backlash and reduced their interest in a potential political career. In contrast, women low on conformity to feminine norms showed an increased desire to enter politics in the face of sexism against a female politician supporting a role-model effect. For males who read about generic leadership difficulties in the study, no relationship between conformity to masculine norms and perceived leadership capabilities was found. However, men who had previously scored high on conformity to masculine norms did show a greater belief in their own leadership capabilities "when gender was made salient through a reminder of a high-profile female politician" (Hunt et al., 2014, p. 728).

Hernandez et al. (2016) proposed and tested a model that integrates different research streams on gender and leadership. The researchers proposed power motivation and transformational leadership as two central yet opposing dynamics that underlie the relationship between gender and leadership role occupancy. The researchers tested a sample of 256 employees, resulting in observed relationships between gender and leadership role occupancy. The authors then discussed intervention strategies for reducing the gender gap in leadership.

The researchers developed the argument that power motivation and transformational leadership form opposing indirect relations between gender and leadership role occupancy. They proposed that women may be more likely to engage in transformational leadership behaviors than men because transformational leadership behaviors are more commonly associated with feminine characteristics. In contrast, the researchers also proposed that women may be less likely to exert the leadership behaviors of using power and influence over others than men because power and influence practices are typically associated with masculine characteristics (Hernandez Bark et al., 2016).

Results among the participants recruited within Spain showed that gender was "significantly related to leadership role occupancy" (Hernandez Bark et al., 2016, p. 477). Men were more likely to have a leadership role occupancy. However, women scored higher in transformational leadership.

Mason et al. (2016) tested the relationship between self-esteem, gender, patriarchal attitudes, and leadership aspirations. A sample of 112 evangelical seminary students was found to have no statistical difference in self-esteem between men and women. An online survey provided results supporting the importance of self-esteem in influencing leadership aspirations. The degree of patriarchal attitudes one holds may affect one's leadership aspirations, and this

relationship may differ for men and women (Mason et al., 2016). "For example, it seems reasonable to expect that men who hold higher patriarchal attitudes would have significantly higher leadership aspirations than women who hold high patriarchal attitudes" (p. 246).

Though there were significant interactions between self-esteem, gender, and patriarchal attitudes on levels of leadership aspirations, Mason et al. (2016) did not find women reporting lower self-esteem than men. Doctrinal belief may be one interesting variable that plays a part between men and women in terms of leadership aspiration. For example, if certain men believe it is their duty or spiritual calling or benevolent responsibility to lead, then those men are likely to pursue leadership roles regardless of their own perceived abilities or preferences or confidence (Mason et al., 2016). The research "supported the general conclusion that self-esteem is an important factor in determining leadership aspirations.…However, men who reported higher levels in patriarchal attitudes tended to have higher aspirations to lead regardless of their levels in self-esteem" (Mason et al., 2016, p. 254). Therefore, the research generally concluded that patriarchal attitudes can affect leadership aspirations in being related to a higher likelihood that men, more so than women, will aspire to leadership roles.

Koenig, Eagly, Mitchell, and Ristikari (2011) also ask the provocative question: Are leader stereotypes masculine? To answer this question, the researchers conducted a meta-analysis within three research paradigms. They did establish a strong tendency for leadership to be viewed in cultural masculine terms; however, changes over time have become clearly more androgynous.

The implications of the masculinity of leader roles for prejudice against female leaders are straightforward: Men fit cultural construals of leadership better than women do and

thus have better access to leader roles and face fewer challenges in becoming successful

in them. (Koenig et al., 2011, p. 637)

Gray and O'Brien (2007) crafted the Career Aspirations Scale (CAS), which uses two

subscales consisting of the Leadership and Achievement Aspirations Scale and Educational

Aspirations Scale. Years later, Gregor and O'Brien (2015a) would improve upon the CAS with

the Career Aspiration Scale-Revised (CAS-R), adding a third scale called Achievement

Aspiration. Specifically, the Leadership and Achievement Aspirations Subscale intends to

measure the degree to which respondents aspire to leadership positions. Participants taking the

assessment were asked to rate items on a five-point Likert scale ranging from strongly agree to

strongly disagree. An example of a positively scored item is "I hope to become a leader in my

career field," (Gregor & O'Brien, 2015b, para. 3), and an example of a negatively scored item is

"Becoming a leader in my job is not at all important to me" (para. 3). The CAS-R is an

instrument that may prove beneficial in future investigations into leadership interest.

In summary of sociological factors, research suggests that a person is especially more

likely to be interested in leadership when the surrounding culture values leadership and

reinforces leadership pursuits.

Ecological Factors – Environment and Opportunities

In this review, ecological factors primarily refer to external influences that are not

directly tied to human relationships. Thus, contextual circumstances and individual

opportunities are included in this sphere. Environmental opportunities are mainly distinguished

from social factors in that they are not inherently based on human relationships. For example, a

cultural expectation may be for employees to advance their careers and pursue higher leadership,

but some ecosystems may lack the developmental opportunities for employees to pursue those aspirations.

Bass (2008) inferred that motivation to learn leadership is directly related to the organizational environment and the motivation to learn in general. He wrote that people are "motivated to attend, to learn from training courses, and to transfer the knowledge, skills, and abilities (KSAs) they have learned to their work when they see that positive transfer from training to their job will be beneficial to them" (p. 1108). The author also pointed out several key factors related to trainees' motivation:

- Confidence about using what they have learned

- Awareness that new knowledge, skills, and abilities (KSAs) are appropriate to their job

- Belief that the new KSAs would be helpful in dealing with job demands

- Respect for the reputation of the trainers or the training organization

- Value for the managerial training courses and would recommend them to peers

Bass (2008) also highlighted the importance of social supports. Salient is the support or lack of it by the trainee's immediate superior. Furthermore, the trainee's belief in his or her self-efficacy can mediate the effects of training for better or for worse.

Much of the literature examining the evidence for leadership opportunities centers around the lack of leadership applicants within school systems (Bush, 2011; d'Arbon, Duignan, & Deirdre, 2002; Galdames & Gonzalez, 2016; MacBeath, 2011). Growing evidence implies a worldwide shortage of principal applicants (d'Arbon et al., 2002). Mulford (2003), for example, has cited the widening gap in applicants for school leadership roles beginning as early as the 1980s in the United States and the United Kingdom. An analysis in Catholic schools in New

South Wales, Australia, revealed that teachers had a high level of unwillingness to aspire to principal positions (d'Arbon et al., 2002). Most significantly, many teachers' perceptions were that becoming a principal would negatively impact family and personal life. Other factors included age, religion, gender issues, and the nature of the selection and interview process. A significant positive factor was the opportunity to make a difference in the lives of students, and the authors advocated for developing a culture of leadership in schools (d'Arbon et al., 2002).

England and Scotland also face a recruitment and retention crisis (MacBeath, 2011). The emerging phenomenon there and elsewhere is that people see school leadership positions as too stressful. The overbearing workload, external accountability, and ultimate authority for success or failure in a high-stakes policy environment are just not worth the costs to many. Add to that the pervasive sense of loneliness that has been expressed by many school leaders, and the incentives are just not there for pursuing principalships (MacBeath, 2011).

Bush (2011) highlighted issues in obtaining principals: recruitment, leadership development, networking, and diversity. He summed up the problem that not enough quality leaders are available, and that these personnel issues are facilitated and compounded by burdening socioeconomic issues (e.g., poverty, crime, and unemployment). In response, many nations are implementing national preparation programs aiming to improve both the incentive for pursuing leadership positions as well as the professional quality of leaders (Bush, 2011).

Galdames and Gonzalez (2016) studied the relationship between teachers' interest in becoming a principal and actual leadership preparation in Chilean school teachers. Their analysis supports the increasing evidence for training and preparation as a potential enhancer for principalship interest. A quantitative, online survey approach was used with a sample of 220 school teachers with no formal leadership responsibilities. The authors looked at the level of

interest in assuming a principal position, the level of leadership preparation, and the relationship between leadership preparation and teacher interest. They found a significant and positive relationship "between teachers' perception about their leadership capacities and their level of interest in becoming future principals.…These results suggest that teachers who perceive themselves more prepared also present more interest in assuming the principalship" (Galdames & Gonzalez, 2016, p. 445). The research indicated an importance for teachers to feel prepared to take on a higher role. Both the informal relationships and the formal preparation helped facilitate a higher interest in pursuing leadership, in this case, principalship (Galdames & Gonzalez, 2016). Findings also indicated that age, professional training, and opportunities to exercise leadership were relevant variables in understanding the level of interest of teachers. In particular, leadership training was identified as an important way to increase teacher interest in administrative positions (Galdames & Gonzalez, 2016).

Although preparation and support as demonstrated by Galdames and Gonzalez (2016) may help increase teacher participation in pursuing a principalship, much more incentivizing was needed to outweigh the perceived negatives of becoming a school administrator (d'Arbon et al., 2002; MacBeath, 2011). One key element that seemed to discourage teachers' interest in principalship is the perception of the leadership role as more demanding, difficult, and complex without enough compensation to make up for the personal and social costs (Galdames & Gonzalez, 2016). Evaluating the potential risks and benefits, many would-be aspiring leaders decided the position was not worth the effort.

Overall, studies show an agreement on the relevance of leadership preparation, and yet, no clear sense of implementation and practice is evident (Bush, 2011; Rhodes & Brundrett, 2006). These studies also suggest that a lack of professional development, in turn, creates a lack

of leadership candidates. Rhodes and Brundrett (2006) found that in the United Kingdom, the distribution of leadership is affected by specific school characteristics such as size. Smaller schools, for example, showed teachers working more closely together, which encouraged leadership roles, while larger schools created more silos where work was fragmented and isolated. In these cases, an interest in leadership and a desire to pursue a leadership role was directly related to the training and opportunities afforded to employees. In other words, unless teachers are given the proper opportunities to develop their leadership capacities, those teachers are unlikely to become good candidates for principalship. Consider the following analogy:

> Some travellers have already caught the train and know how to get to the next stop and are willing to change trains if necessary. These travellers are very aware that their head teachers hold the travel tickets they require and are dependent on this source of travel information. Indeed, a great deal of confidence is placed in head teachers as the guardians of the necessary route maps. Other aspirant leaders appear to be on the journey by chance rather than by design and are not yet sure where to get off. Worryingly, some potential leaders can't find the train and are desperately seeking advice and the confidence to get on-board. Travellers ask themselves, what incentives do I have to travel? A barrier to travel appears to be linked, in some cases, to difficulties in the translocation of self-conception to a new professional identity. (Rhodes & Brundrett, 2006, p. 284)

Research further suggests that a culture of leadership development and distribution must be fostered to ensure long-term organizational success (Brundrett, Rhodes, & Gkolia, 2006). "The mindset of heads and other senior leaders, the culture they have created within the school,

the static influences of context such as school size and the more flexible immediate context of school performance all appear to be influential" (Brundrett et al., 2006, p. 266).

Simkins, Close, and Smith (2009) found that informal experiences like mentoring, peer encouragement, and early leadership responsibility opportunities were probably more beneficial to leadership development in trainees than the formal professional development programs. Key themes emerged when evaluating aspiring school leaders: transition, capability, and identity which work-shadowing can help to address. Shadowing helps potential leaders to contemplate the role and frame their experiences in meaningful ways (Simkins et al., 2009). In line with this role-modeling, behavior modeling training is generally accepted as effective for developing skills and changing behavior. Learners benefit from more opportunities for self-diagnosis and self-directed learning (Pescuric & Byham, 1996).

Earley (2009) found that teachers often build their leadership identity based upon their early learned experiences and their relationships with their own principals. Key experiences to learning leadership were "on-the-job" and "hands-on" experiences. Again, culture of the organization, in this case schools, and the support of leadership development were crucial (Earley, 2009).

Candidates embodying multiple forms of intelligence are also more likely to have an interest in pursuing leadership roles, and possession of multiple forms of intelligence and multiple styles of leadership are linked to effective leadership (Gardner, 2011; Riggio, Murphy, & Pirozzolo, 2002). Thus, incorporation of multiple intelligences is important to the training of future leaders. Riggio et al. (2002) discussed the roles of these multiple intelligences on leadership styles. However, intelligence is not everything, and leadership is often based on context. Case in point, although leaders are often smarter than their followers, many of the

smartest people may never pursue leadership roles. This lack of interest in and desire to pursue leadership may simply be due to a lack of environmental opportunities, or it may be because other influential factors are more important to leadership interest than a mere intelligence quotient (IQ). Therefore, IQ alone is not very predictive of the future leader. But when considering various types of intelligence such as emotional intelligence, social intelligence, practical intelligence, and creativity, a more nuanced and deeper implication for good leadership is constructed. When multiple forms of intelligence and leadership are considered, then a better prediction model for effective leadership is formed.

> Because of situational factors, we cannot assume that the relationship between intelligence and leadership is a straightforward one. Of course, many modern theories of leadership emphasize this interaction of leader characteristics (such as intelligence) and qualities of the leadership situation.…For a long time, any scholar or informed observer of leadership has known that great and effective leaders have had something more than mere IQ going for them. (Riggio, 2002, p. 2)

The authors also highlighted how different cultures have very different thoughts and values on leadership which in turn impacts the types of leaders that arise.

The validity of the situational interview—questions based on job analysis, critical incident technique, with a dilemma that forces applicants to state their true intentions rather than socially expected ones—may be explained by cognitive ability and emotional intelligence as mediators (Sue-Chan & Latham, 2004). Researchers found that the situational interview was not correlated with cognitive ability, but it was correlated with emotional intelligence. But both the situational interview and cognitive ability predicted academic performance. Also, the situational interview predicted team-playing behavior (Sue-Chan & Latham, 2004).

Neck and Houghton (2006) evaluated self-leadership theory, a process in which a person learns to control his or her behavior through implementing behavioral and cognitive strategies. The theory is an expansion of self-management and self-control concepts. Self-leadership, along with related motivational, personality, and self-influence constructs may prove applicable in today's context.

In conclusion, two decades after its conception, self-leadership continues to show impressive potential for application in today's fast-paced and highly technical competitive environments characterized by flexible and decentralized organizational types. As organizational members at all levels are encouraged to take more and more responsibility for their own jobs and work behaviors, the ability for these workers to successfully lead themselves will become increasingly critical. (Neck & Houghton, 2006, p. 288)

People who seem more interested in leadership can learn leadership skills when given opportunities. Since leadership can be learned, leadership should be a common subject of recruiting, training, and development (Bass, 1997). Students can learn when they practice. Students' passions and pursuits can also be developed as opportunities are afforded (Barnes, 2016). Education, engagement, learning, and teaching all play a vital role in students' interests and nurturing thereof. Educational opportunities can instill the desire to achieve, build on talents and interests, empower students, and connect students with their communities and cultures, deepening their thinking while engaging the heart, mind, and soul (Scherer, 2009). In addition, Slaski and Cartwright (2003) showed that training programs can significantly increase managers' emotional intelligence. The researchers contributed to the notion that leadership skills can be

taught and learned. Furthermore, when these emotional regulation skills were learned, the

participants' overall health, well-being, and even management performance improved.

Many leadership experts have communicated the same idea—in fact, they make a living

off it with their books and speaking engagements—that leadership can be learned (Kotter, 2012;

Kouzes & Posner, 2017; Northouse, 2016; Senge, 2006; Yukl, 2013). Senge (2006) promoted

the concept that leaders are learners, and they foster continuous learning. Kaldor and McLean

(2009) utilized the National Church Life Survey, a research project taking place every five years

since 1991, to develop more effective and sustainable leadership practices while outlining a

range of leadership strengths and personal foundations. Kotter (2012) discussed the process of

creating lasting transformation. Yukl (2013) balanced theory and practice in his text while

surveying the major available research of organizational leadership.

Northouse (2016) discussed different theories and concepts of leadership, giving attention

to the development of leadership among different societies and over the past century or more.

Distinctions were drawn between leaders who are assigned their role by circumstances and

leaders who emerge from choices. "Some people are leaders because of their formal position in

an organization, whereas others are leaders because of the way other group members respond to

them" (p. 8). Also, the very ideas and practices of leadership have changed over time, and thus

the motivations and traits of leaders have changed.

Kouzes and Posner (2017) further described leadership as a skill to learn and a

relationship to be nurtured. The authors offered a classic example of how leadership can be

understood as a learned skill rather than an innate characteristic, proposing that practically

anyone can become a leader if he or she is willing to learn and follow certain practices. Vision,

or forward-thinking about the future, was a particularly strong trait in leaders. Candidates who

set clear goals and seek to accomplish them often take on leadership roles. The authors espoused that leadership is not about personality, but rather, leadership is observable and learnable. Finally, Kouzes and Posner (2017) discussed how "leadership is something you experience in an interaction with another human being" (p. 28). Leaders and their followers all vary in their personalities, experiences, and daily interactions. Therefore, potential leaders are often discovered when their abilities and personalities meet the needs and desires of a community of constituents.

Overall, based on the aforementioned literature, the research suggests that a person is especially more likely to be interested in leadership when he or she is exposed to good leaders and provided with opportunities to explore leadership roles. In other words, the more that environmental exposure to leadership exists, the more apparent interest in leadership is observed and cultivated within individuals.

Summary

Leadership has often been thought of in terms of experiential wisdom passed down or mysteriously imbued talent, but leadership has in recent decades become increasingly studied across the social sciences (Collinson & Grint, 2005). "Since the 1940s there has been an enormous outpouring of writing on leadership" (p. 5). Leaders, it appears, are not just born or made or summoned; they are deconstructed and repackaged in systematic and scientific wrapping. Yet, there is often little consensus on what leadership actually is or does. What usually is agreed upon is that leadership is important, and effective leadership is vital to the health and longevity of organizations and society (Collinson & Grint, 2005). Societies' mutually understood importance of leadership has fueled the intense expedition to either finding or creating good leaders. As Collinson and Grint (2005) lament:

Despite, or even perhaps because of, the amount of this theoretical, empirical and

practitioner-oriented material on leadership, both in the past and in the contemporary

context, there is little sense of any established conceptual commonality from amongst the

writings, let alone a sense of community between academic leadership researchers.

Leadership "research" has frequently been at best fragmented and at worst trivial, too

often informed by the rather superficial ideas of management and academic consultants

keen to peddle the latest, pre-packaged list of essential qualities deemed necessary for

individual leaders and as the prescribed solution to all leadership dilemmas. Within

business schools and management departments leadership has often remained a

"Cinderella" subject, neglected and/or underestimated by those keen to analyze and

theorize the social, political, organizational and philosophical dimensions of human

affairs. (Collinson & Grint, 2005, p. 5)

The purpose of this literature review and, by extension, this dissertation, has been to help

defragment and assemble one small aspect of leadership studies. By better understanding the

internal—biological and psychological—and external—sociological and ecological—factors that

exist in leaders, researchers can better understand the motivations of leadership and what

encourages a person to pursue leadership in the first place. The bioecopsychosocial (BEPS)

profile of those that show an interest in leadership may help researchers and practitioners better

recruit and better train prospective leaders.

As this literature review indicated, certain BEPS factors may influence a person's interest

in leadership. Overall, the research suggests that a person is especially more likely to be

interested in leadership when he or she has high cognitive abilities, high self-esteem, and high

emotional intelligence. Ergo, if a person has characteristics such as high self-esteem and high

emotional intelligence, then he or she is more likely to both be interested in leadership and pursue leadership opportunities. The literature relates to this current study in terms of seeking more concrete factors that impact leadership interest. Primarily, this current study examined the environmental input influencing an interest in leadership by using Google Trends data as a proxy of user interest. By examining the temporal-spatial context of online users searching for leadership-related content, this current study helps determine the when and where of a person's interest.

This literature review also introduced a conceptual framework for factors which contribute to an overall interest in leadership, as well as contained a discussion on the trending use of search engine data in research. In Chapter Three, the methods used to study interest in leadership are be delineated. The research methodology identified in the next chapter is used to compare Google search queries for the term leadership and the temporal-spatial context of those searches. The sample and sample selection process, as well as the instrument and procedures used to collect data, are described. A description of the results follows in Chapter Four, and a discussion of those results are in Chapter Five.

III. METHODOLOGY

This chapter contains a general description and an explanation of the methods used in completing the current study, with special emphasis placed upon the instrumentation used and the analysis of data. A logical organizational pattern is reflected in the chapter's overall structure, arranging the content in sequence and in terms of the relationships of the concepts (Joyner et al., 2013). This chapter begins with a description of the general research perspective and type. Then, a brief discussion is provided on using Google data in research. The chapter also includes the research context, the participants, the instruments and procedures used in collecting the data, the procedures used in analyzing the data, and a chapter summary.

The general research perspective is that of a quantitative study, and the research types are descriptive, comparative, and correlational. The study took place within the time and place context of Internet-based search engine data gathered from millions of online users from January 1, 2004, to December 31, 2017. The research subjects were anonymous Web users—primarily Google users. Although the researcher was aware of other variables to explore, his principal concern was with Google users within the United States. The population consisted of all 50 states plus the District of Columbia, and the sampling procedure was automatically generated by the Google Trend's report algorithm.

The descriptive statistics reported in Chapter 4 include measurements such as the:

- Normalized frequency score

- Mean, median, and mode

- Range and variance

- Standard deviation

Using Google Data

Using the Current Population Survey (CPS), the U.S. Census Bureau has collected data about computer use since 1984 and data about Internet use since 1997. In 1984, only about eight percent of households had a computer. By 2000, 51% of all households had a computer, and by 2015, 87% of households had a computer. In 1997, 18% of households used the Internet. Just one decade later, this percentage had more than tripled to 62% and then increased to 77% by 2015 (Ryan & Lewis, 2017).

In 2013, the American Community Survey (ACS) began collecting these data points on computer and Internet use. In the 2015 report, the survey showed that among all households, 78% had a desktop or laptop, 75% had a handheld computer such as a smartphone, 77% had a broadband Internet subscription, and 62% had "high connectivity," meaning they had three key computer and Internet items (Ryan & Lewis, 2017).

By 2018, the number of adults online leaped to roughly nine in 10 (Pew Research Center, 2018). Groups that are most likely to be offline are seniors, those living in rural areas, those with lower income, and those with lower academic performance (Anderson & Perrin, 2016). Although these Internet adoption gaps remain among factors such as age, race, income, education, and community type, that gap has increasingly narrowed to only a few percentage points sporadically.

Among Internet users, Google has captured a majority of those browsing the Web. Billions of searches are conducted on Google every day (Google Search Statistics, 2017). As of August 2016, with an estimated 1.6 billion unique monthly visitors, Google held 72.48% of the world's market share of searches (Ratcliff, 2016). Over the years, Google has sought to improve its services through updated algorithms and user-friendly Web applications. One such popular application is Google Trends.

Google Trends was first released in May 2006 and would undergo a few iterations over the years with Google Insights for Search launching in August 2008 and then the two services combining in September 2012 (Jun et al., 2017). Initially, the potential of Google's new tools would hardly be considered or realized. However, as big data has continually wooed many scholars, the application of using Google Trends in social science research has blossomed. Whether for the private or public sector, Google data can help users to know when, what, and how to promote their products and services, as well as to better understand information seeking behavior.

Google Trends provides an index of the volume of Google queries by geographic location and category. Google Trends data does not report the raw level of queries for a given search term. Rather, the online tool reports a *query index*. The query index starts with the *query share*: the total query volume for search term in a given geographic region divided by the total number of queries in that region at a point in time. The query share numbers are then normalized so that they start at 0 in January 1, 2004. Numbers at later dates indicated the percentage deviation from the query share on January 1, 2004. This query index data is [*sic*] available at country and state level for the United States and several other countries. (Choi & Varian, 2009a, p. 1)

Google Trends is freely available to the public, and the data are derived from Google Search. When users request trend data for a term, they are provided with a graph in which the horizontal axis represents time (available going back to 2004) and the vertical axis represents relative search volume (available either by city, region, country, or globally). The raw data undergo two transformations prior to public release (Google, 2018b):

1. Data are normalized to adjust for overall growth and usage trends of global users. "Each data point is divided by the total searches of the geography and time range it represents to compare relative popularity. Otherwise, places with the most search volume would always be ranked highest" (Google, 2018b, para. 3). Figure 4 shows a sample equation of the first data adjustment.

2. Normalized data are rescaled to an index of zero to 100 based on a term's proportion to all searches. Figure 5 shows a sample equation of the second data adjustment.

$$\frac{\# \; of \; queries \; for \; keyword}{total \; queries} = relative \; popularity$$

Figure 4. Equation for normalizing data.

$$\frac{all \; relative \; data \; points}{highest \; data \; point} = scaled \; index \; score$$

Figure 5. Equation indexing data.

By adjusting the relative search volume by time and place, Google Trends allows users to compare terms and popularity in a more meaningful way. Therefore, in the current study, interest refers to search popularity as compared to all other searches for the requested time period and region. Restated, relative search frequency was used as a proxy for Google users' interest in leadership.

Numbers represent search interest relative to the highest point on the chart for the given

region and time. A value of 100 is the peak popularity for the term. A value of 50 means

that the term is half as popular [as compared to its peak popularity]. Likewise, a score of

0 means the term was less than 1% as popular as the peak. (Google, 2018a, para. 1)

An important detail to remember is that Google Trends adjusts the output data to make

term comparisons more user-friendly. Table 3 depicts an example of how scaling takes place

when using Google Trends. A higher value represents a higher proportion of searches relative to

the total searches conducted and not a higher absolute query count of the number of searches.

The implementation of relative rather than absolute search volume is to help control for differing

population sizes and Internet access inequality among different times and regions. So, "Different

regions that show the same search interest for a term don't always have the same total search

volumes" (Google, 2018b, para. 5). For example, a smaller country may see a higher value score

for a search term even though their absolute search volume is smaller than a much larger

country's absolute volume. It is also important to mention that Google strives to protect the

privacy of its users. All personally identifiable information is removed from the data before

being made available through Google Trends (Privacy Policy, 2018).

Table 3

Example – Google Trends Scaling

	Day 1	Day 2	Day 3
Total daily search in the U.S.	1,000,000	1,000,000	2,000,000
Search volume for the keyword "leadership	3,000	2,500	2,500
Relative popularity of "leadership"	0.003	0.0025	0.00125
Scaled Google Trend score	100	83	42

One of the more promising aspects of using search engine data for social science research is that online users are more likely to provide true, unsolicited behavior patterns. Evidence suggests that Google data are unlikely to suffer from certain limitations (e.g., social censoring) of other social science methodologies since searchers are likely to be alone and under no peer influence when online (Stephens-Davidowitz, 2013a). Google may reveal meaningful and interesting social patterns because the information is aggregated from billions of searches.

For example, Stephens-Davidowitz points out that the percentage of Google searches including the word "God" can explain as much as 60% of an area's variation in belief in God, and the percentage of searches for "gun" can account for over 60% of the variation in a state's gun ownership rate. Furthermore, these high signal-to-noise ratios—meaning how useful the information available is given the entirety—hold despite searchers having various reasons for using these terms. "If a certain group is more likely to use a term on Google, aggregating millions of searches and dividing by total searches will give a good proxy for that group's area-level population" (Stephens-Davidowitz, 2013a, p. 7).

Research Questions and Hypotheses

The study's research questions and null hypotheses were stated as follows:

1. Was interest in the topic of leadership, described as leadership interest, normally distributed during the time period of 2004 through 2017 using Google Trends?

H_0: There will be no significant difference in interest in leadership, as measured by the one-sample Kolmogorov-Smirnov (K-S) test statistic, between the 12 different months of the year.

2. Was interest in the topic of leadership, described as leadership interest, statistically

   significantly different from the years 2004 through 2006 in comparison to the time

   period of 2014 through 2016 using the Google Trends data platform?

H_0: There will be no significant difference in interest in leadership, as measured by the t

   test of independent means, between the time periods of 2004-2006 and 2014-2016.

3. Was interest in the topic of leadership, described as leadership interest, normally

   distributed for states during the time period of 2004 through 2017 using Google

   Trends?

H_0: There will be no significant difference in interest in leadership, as measured by the

   one-sample Kolmogorov-Smirnov (K-S) test statistic, between the 51 geographic

   states.

4. Was interest in the topic of leadership, described as leadership interest, statistically

   significantly different for states during the time period of 2004 through 2006 in

   comparison to the time period of 2014 through 2016 using the Google Trends data

   platform?

H_0: There will be no significant difference in interest in leadership, as measured by the t

   test of independent means, between the time periods of 2004-2006 and 2014-2016

   within the different geographic states.

5. Was interest in the topic of leadership, described as leadership interest, statistically

   significantly different for high search volume cities only in comparison to the

   inclusion of low search volume cities during the time period of 2004 through 2017

   using the Google Trends data platform?

H_0: There will be no difference in interest in leadership, as measured by the t test of independent means, between low search volume cities and high search volume cities.

6. Was interest in the topic of leadership, described as leadership interest, statistically significantly different for high search volume cities within Florida only in comparison to the inclusion of greater metro areas in Florida during the time frame of 2004 through 2017 using the Google Trends data platform?

H_0: There will be no difference in interest in leadership, as measured by the t test of independent means, between high search volume cities in Florida and the ten media markets in Florida.

7. To what degree does the political preference of major U.S. cities associate with and predict interest in leadership in those cities represented in the study's sample from 2004 through 2014 using Google Trends and a city conservatism score?

H_0: There will be no significant relationship in interest in leadership, as measured by the Pearson product-moment correlation coefficient (r), between cities identified as politically conservative and the cities identified as politically liberal.

Research Context

The setting in which this research takes place is within the archived and accumulated data of Google users' search behavior. The setting is online, anywhere at any time. The setting can be at a person's home on a personal computer, at work with a company laptop, or on-the-go with a mobile device. The setting is not limited by time and space in the traditional sense of research settings.

The Population – Subjects/Participants

The population representing the focus of the study was primarily Google users in the United States. The parameter, or specific variable of interest in the study, was the level of interest in leadership as understood by measurements of Google users' information seeking behavior patterns. The sampling frame would ideally be a list of every Google user in the United States. The actual sample was a subset of users from the larger population that was provided through the Google Trends instrument. However, because of the sheer volume of users and search data, the sample can be seen as mostly representative and generalizable.

Subjects were unidentified online users—specifically, those using the Google Search online application. Subjects were not recruited or identified. In this sense, no true subjects exist in the study. Rather the study utilized archived, aggregated, and anonymous Google search data from users in the United States.

Instrumentation

The primary instrument used in this study to collect the data was Google Trends which offers free, publicly accessible data on search engine trends. Data samples can easily be exported from Google Trends as normalized scores. Data can be defined by two primary categories: (a) the general time in which Google searches took place such as by week or by month, and (b) the general location in which Google searches took place such as by state or by country.

Validity

It can be argued that "leadership is best studied in a natural setting, and that artificial experimental control will inhibit the ecological validity of research on leadership" (Stein et al., 2009, p. 98). To this end, using search engine behavior data has high validity in that it produces

real-world, real-time, authentic results. The premise behind Google Search and Google Trends is straightforward. A researcher can simply look at the search volume of a given term as relative to all other searched items. Therefore, the Google instruments measure what they intend to measure (construct validity), give evidence of effects over time and across regions (internal validity), and allow the user to make basic generalizations (external validity). Researchers can also reasonably conclude that the data generated from Google is generally an accurate representation of the inquired populations' online behavior (conclusion validity).

Reliability

Other research has contributed to the validation of Google Trends' reliability (Carriere-Swallow & Labbe, 2013; Stephens-Davidowitz, 2013a). Continued testing of the reliability of Google Trends extends beyond the scope of this current study. As mentioned previously, there is a degree of concern for reliability with Google Trends in that the user does not receive the exact same results every time a download is requested. This measurement error is due to the issue that Google data stem from trillions of data points that are not easy to represent in full form. To ensure usability and efficiency, Google Trends uses a computational model to retrieve a smaller but representative sample of the search data; otherwise, analysis of the data would not be feasible. Nevertheless, the Google data samples still represent the collective online search behavior of millions of users, as compared to traditional survey instruments, which may only sample in the hundreds. Among tests and checks, Cronbach's alpha may be used in conjuncture with multiple query downloads to determine internal consistency and reliability.

Data Collection Procedures

In completing the research design, several specific procedures were used. The procedure used in collecting the data includes three steps:

1. Navigate through a Web browser to the desired data collection site (in this case, Google Trends).

2. Submit an inquiry for the desired output (in this case, the term leadership).

3. Download and review the results through an exported file (typically a CSV file).

Relationships between search activities and another variable can be referred to as a Google predictor (Askitas & Zimmermann, 2009). In this study, the predictor for interest in leadership was the trend of search behavior for the term leadership. For the purposes of this study, no search queries other than the exact word leadership were used. Variations, synonyms, and translations were excluded. However, these terms, as well as more topical-based queries, can be explored in subsequent research.

Correlation Data

Comparison data for Research Question 7 was derived from Tausanovitch and Warshaw's (2014) findings which establish normalized scores of conservatism for major U.S. cities. Since Research Question 7 seeks to find a relationship between leadership interest and city politics, an explanation of Tausanovitch and Warshaw's data is given in this current subsection of the methodology. The current subsection also helps present how the Google data and the conservatism data relate together.

Tausanovitch and Warshaw (2014) studied the responsiveness of municipal governments and examined the relationship between the policy preferences of the mass public and municipal policy outcomes. They measured the mean policy conservatism in every U.S. city with a population above 20,000 people and found that municipal politics did appear ideological as seen by policies enacted by the cities corresponding with the liberal-conservative positions of their citizens on national policy issues. Institutional influences, such as the presence of an elected

mayor, the popular initiative, partisan elections, term limits, and at-large elections, were also considered in their final report.

Tausanovitch and Warshaw (2014) scaled the ideal points of over 275,000 people across over 1,600 municipalities, pooled from seven large-scale policy surveys—the 2006, 2007, 2008, 2010, and 2011 Cooperative Congressional Election Surveys (CCES) and the 2000 and 2004 Annenberg National Election Surveys (NAES)—to generate their measures of public policy preference in 51 cities with populations of more than 250,000. City-level policy conservatism was estimated for 51 cities with a population larger than 250,000 people using policy measures such as per capita taxes, per capita expenditures, and regressiveness of city taxation. Tausanovitch and Warshaw showed that their estimates of city policy conservatism are both internally and externally valid based upon the high correlation between their estimates of conservatism and the raw, disaggregated measures of city policy preferences from their survey data.

In analyzing the relationship between interest in leadership and city conservatism, an important note is that more populous areas tend to be more liberal in terms of policy and public preferences. As Tausanovitch and Warshaw (2014) pointed out, readers can expect this trend to be the case "because liberal policy is usually associated with more government activity and larger cities have more capacity for activity. This may also be the case for richer cities" (p. 613). Desilver (2014) also pointed out how "overall, the liberal tilt of big cities is unmistakable" (para. 3). Even cities with more conservative reputations can still be reported as somewhat liberal by Tausanovitch and Warshaw's (2014) data. For example, Dallas and Cincinnati were slightly left-of-center.

This is perhaps not surprising: As the Pew Research Center recently found, 46% of

consistent liberals said they'd prefer to live in a city, versus just 4% of consistent

conservatives. Liberals also are about twice as likely as conservatives to live in urban

areas, while conservatives are more concentrated in rural areas. (Desilver, 2014, para. 3)

Internet Sources Referenced

The main analysis of this study was based on Google Trends data. However, other

sources such as Google Correlate and YouTube were evaluated to contribute to the overall

observation of the phenomenon as well as to enhance the final discussion. Other Internet data

collection sources were used in this chapter to help show the utility of using online sources for

research. Example online sources along with their corresponding Web site addresses are shown

in Table 4. These sources would also be beneficial in future research to further elucidate online

information-seeking behavior.

Table 4

Example Internet Data Sources

Internet Source	Web site
Google Search	www.google.com
Google Trends	www.google.com/trends
Google Correlate	www.google.com/trends/correlate
Google Ngram	books.google.com/ngrams
Amazon	www.amazon.com
YouTube	www.youtube.com
Wikipedia	tools.wmflabs.org/pageviews
NewsLibrary	www.newslibrary.com

Note. All data sets were obtained on March 9 and June 16, 2018.

Google Books Ngram. The Google Ngram Viewer allows users to search through millions of digitized books for a particular word. Users can see how a word's usage has developed over time. Figure 6 shows results comparing the words leadership and management.
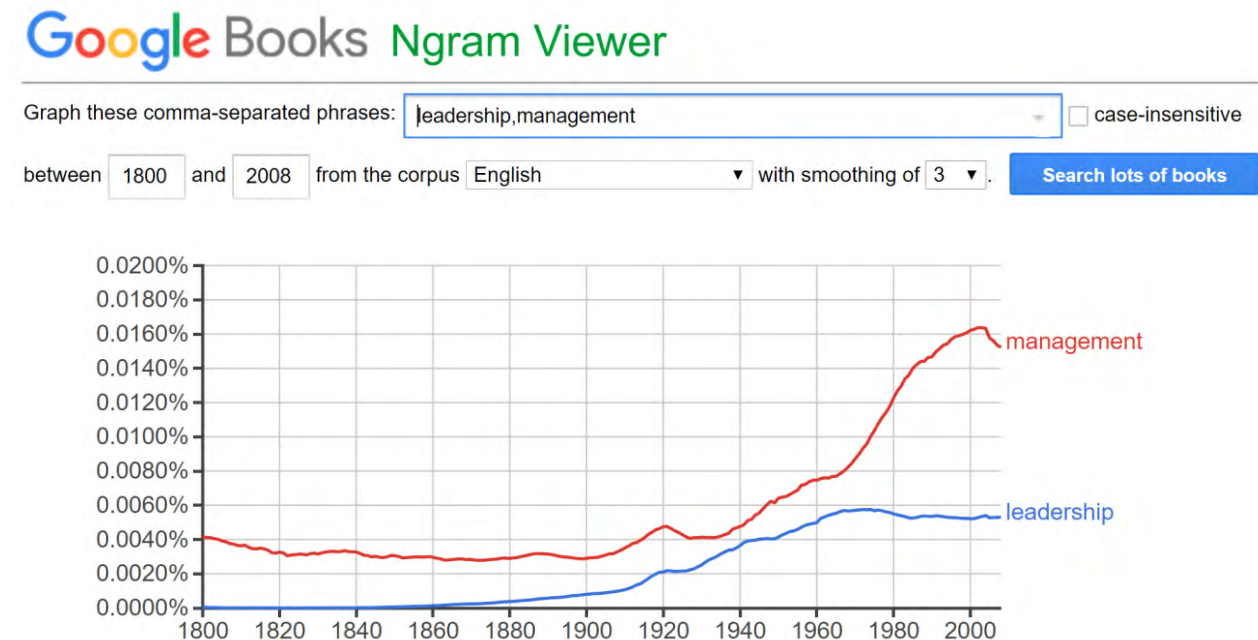
Figure 6. Ngram Viewer results comparing the terms *leadership* and *management* from the years 1800 to 2008. Data source: Google Ngram (books.google.com/ngrams).

Amazon. Table 5 shows search results from Amazon, an online shopping site which was first popularized through its bookstore. Figure 7 shows Amazon's top related searches when the term leadership was typed in the search bar on March 9, 2018.

Table 5

Amazon Search Results

Search Type	Results
All	Over 200,000
Books	Over 100,000
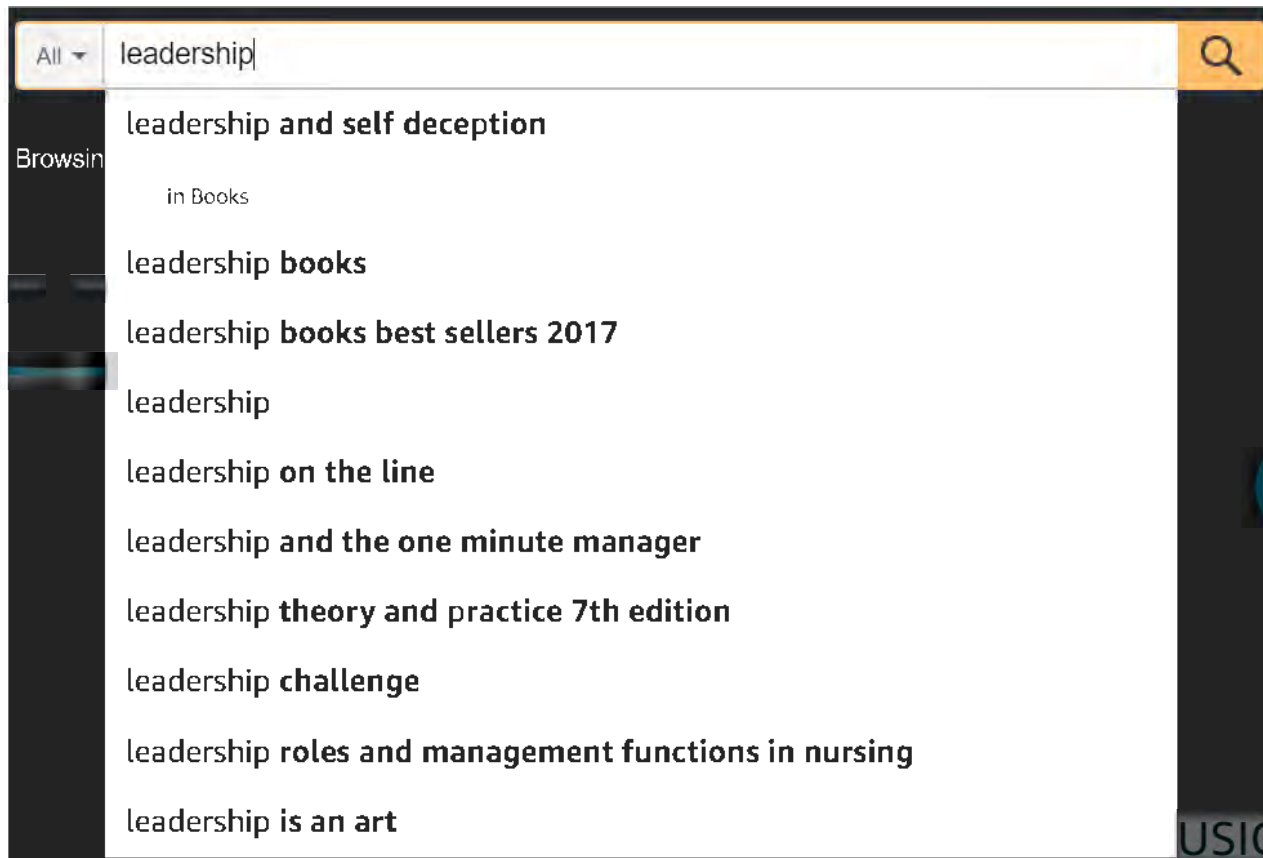
Figure 7. Autocomplete suggestions generated by Amazon when users type in the term

leadership. Data source: Amazon (www.amazon.com).

Wikipedia. The following terms are suggested by Wikipedia as being related to

information on leadership:

- Adaptive

- Performance

- Crowd Psychology

- Followership

- Leadership Accountability

- Leadership School

- Meeting Roles

- Modes of Leadership

- Multiteam System

- Narcissistic Leadership

- Nicomachean Ethics

- Professional Development

- Super-Team

- Three Theological Virtues

- Realistic Job Preview

In Figure 8, daily page views for Wikipedia's "Leadership" page for the dates July 1, 2015 to March 8, 2018 are presented. In Figure 9, monthly views for the same page from July 2015 to February 2018 are shown. Note that in both figures, at the time of the data request, Wikipedia's "Leadership" page had received over two million views with a daily average of 2,155 views, with a page view spike on December 28, 2017. With some rudimentary Web searching, it was speculated that this spike may be partially explained by an application deadline for the AAMC's Leadership and Management Foundations for Academic Medicine and Science seminar. Not surprising, it seems people use Wikipedia as a main source for preliminary research (Leadership and Management Foundations for Academic Medicine and Science, 2018).

NewsLibrary. NewsLibrary allows users to search from more than 274 million newspaper articles from thousands of U.S. publications. Searching for the term leadership produced 12,328,563 articles with leadership in the heading. Concurring with the Google Ngram results, a search for the term management produced 22,316,076 articles.
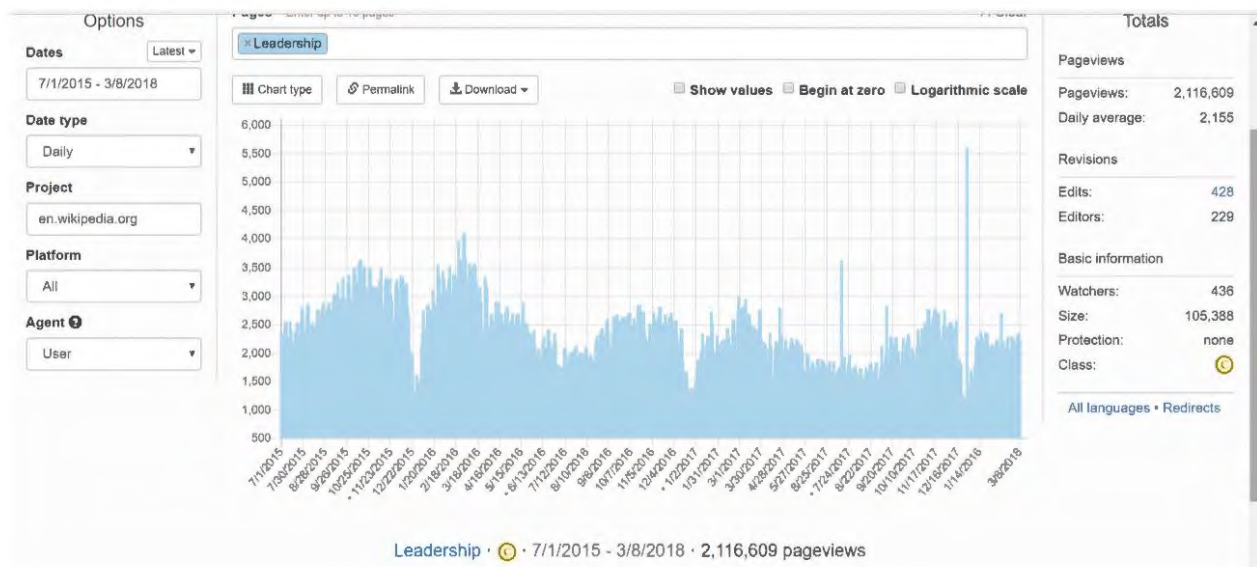
Figure 8. Chart showing daily views generated by Wikipedia's pageview tool when users type in the term leadership. Data source: Wikipedia (tools.wmflabs.org/pageviews).

Figure 9. Chart showing monthly views generated by Wikipedia's pageview tool when users type in the term leadership. Data source: Wikipedia (tools.wmflabs.org/pageviews).

YouTube. Considering the context of this current study, a query for the term leadership within the YouTube Web site generates about 23,000,000 results. Figure 10 shows YouTube's top suggested searches when a user types in the term leadership.

leadership

leadership   Remove

leadership **motivation**

leadership **training**

leadership **skills**

leadership **ted talks**

leadership **video inspirational**

leadership **styles**

leadership **speech**

leadership **video**

leadership **motivational videos**
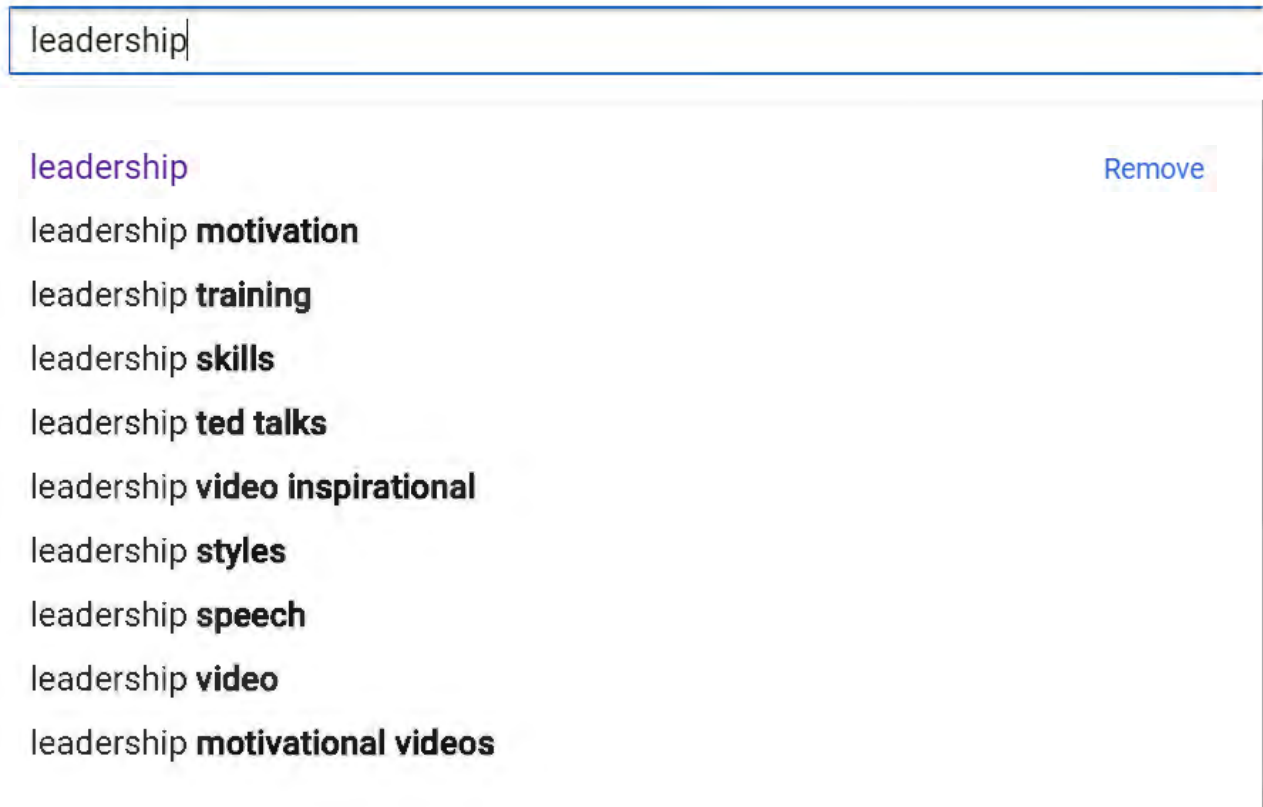
Figure 10. Autocomplete suggestions generated by YouTube when users type in the term

leadership. Data source: YouTube (www.youtube.com).

Google Search. Considering the current study, when searching for the term leadership,

the first link generated is an article titled "What is leadership?" Other searches related to

leadership as determined by Google include:

- what is leadership skills

- qualities of leadership

- leadership in management

- leadership pdf

- effective leadership definition

- leadership types

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- importance of leadership

- leadership styles

In Table 6, the approximate volume of Web page results when users query for the term leadership are illustrated in summary form. One interesting observation from the data shown in Table 6 is that the amount of information pertaining to leadership has increased over the past two decades. However, important to note is that most, if not all, topics have similarly grown as the Internet itself has expanded. Figure 11 shows Google's autocomplete suggestions when users type in the term leadership. Note that some of Google's suggestions may be related to the users' locations.

Table 6

Google Search Results

Search Type	Results
All (1998)	About 203,000
All (2018)	About 424,000,000
All	About 850,000,000
All (verbatim)	About 78,000,000
News	About 38,900,000
Videos	About 13,400,000
Books	About 27,300,000

Google Correlate. The top ten search items, along with their *r* values, correlated with the search term leadership as determined by the weekly search volumes are displayed in Table 7. Figure 12 shows a line chart generated by Google Correlate comparing the weekly search rate of the terms leadership and assessment. These data suggest that online users seeking information on leadership are also looking for leadership assessments. The top ten search items, along with their *r* values, correlated with the search term leadership as determined by the monthly search

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volumes are displayed in Table 8. Monthly search rates, as compared to weekly search rates, produced similar results with many of the same terms but to varying degrees.
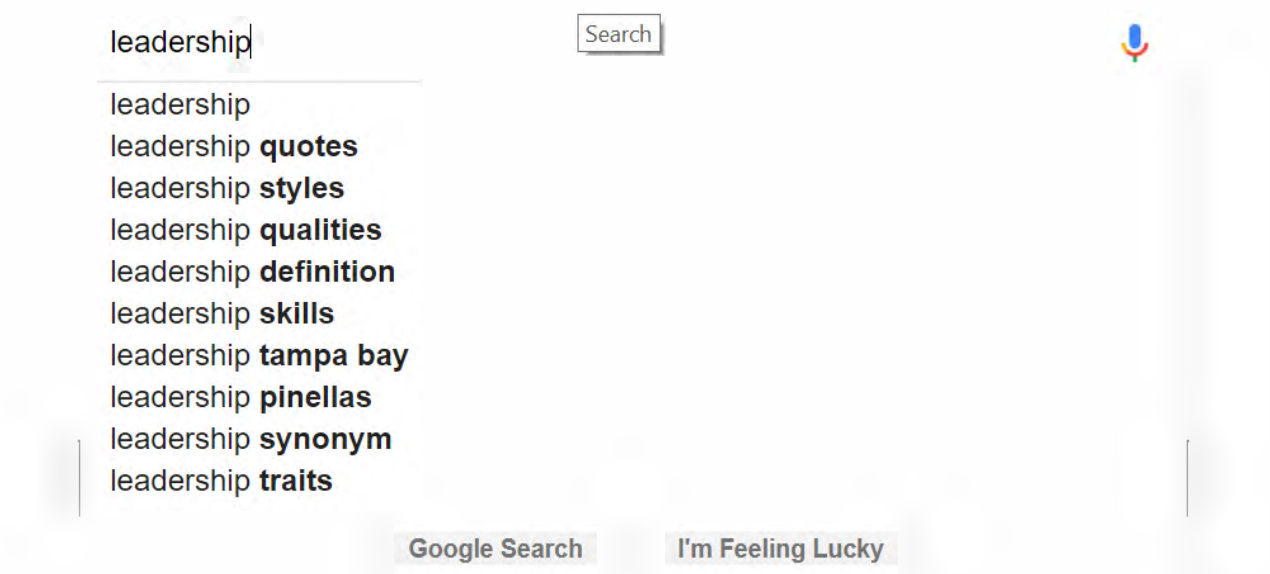
Figure 11. Autocomplete suggestions generated by Google Search when users type in the term leadership. Data source: Google Search (www.google.com).

Table 7

Top Ten Google Correlate Results for Leadership – Weekly

r	Term
0.9527	assessment
0.9404	integration
0.9308	supply chain
0.9271	cardiovascular
0.9271	competency
0.9270	experiential
0.9265	distribution
0.9260	structural
0.9255	hypertension
0.9243	assessing
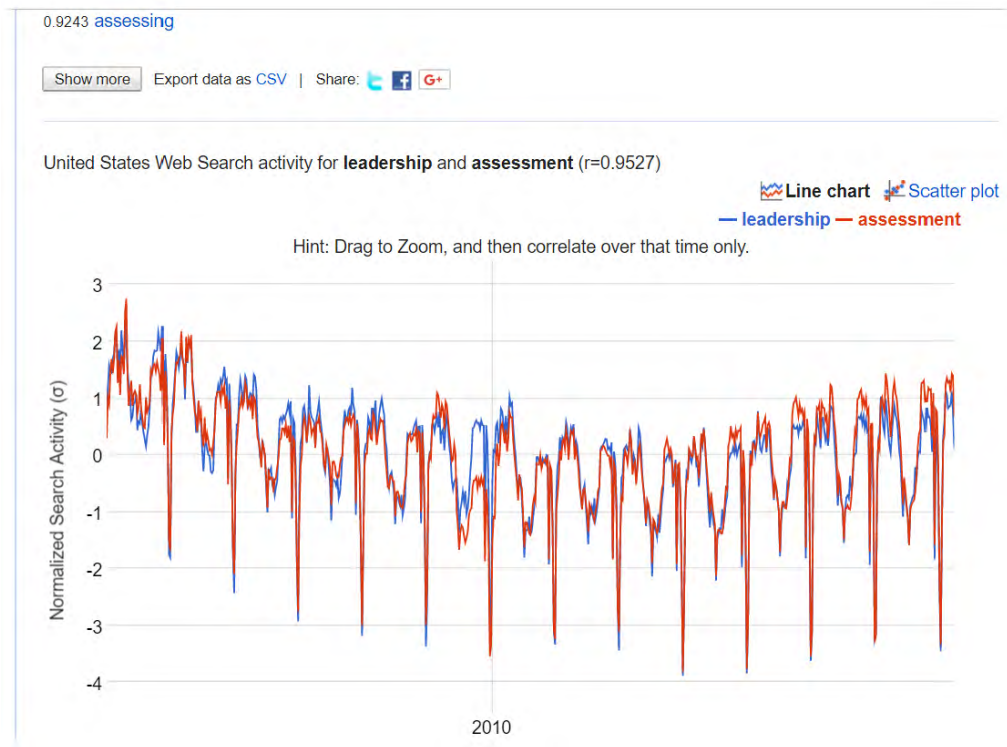
Figure 12. Weekly United States Web search activity for leadership and assessment. Data source: Google Correlate (www.google.com/trends/correlate).

Table 8

Top Ten Google Correlate Results for Leadership – Monthly

r	Term
0.9514	experiential
0.9449	assessment
0.9444	hypertension
0.9390	integration
0.9296	environments
0.9289	competency
0.9270	structural
0.9269	supply chain
0.9253	microbial
0.9240	cardiovascular

Figure 13 shows a line chart generated by Google Correlate comparing the monthly search rate of the terms leadership and experiential. Again, as is also shown by the weekly search results, these data suggest that online users seeking information on leadership are also looking for information on experiential leadership and assessments. The top ten search items, along with their *r* value, correlated with the search term leadership as determined by geographic search volumes within the states are displayed in Table 9.

Figure 14 shows a map shading chart generated by Google Correlate comparing the monthly search rate of the terms leadership and leadership conference. These data suggest that online users seeking information on leadership are also looking for leadership conferences, which would also corroborate the Wikipedia findings on upcoming leadership conferences corresponding with dramatic increases in pageviews on leadership.
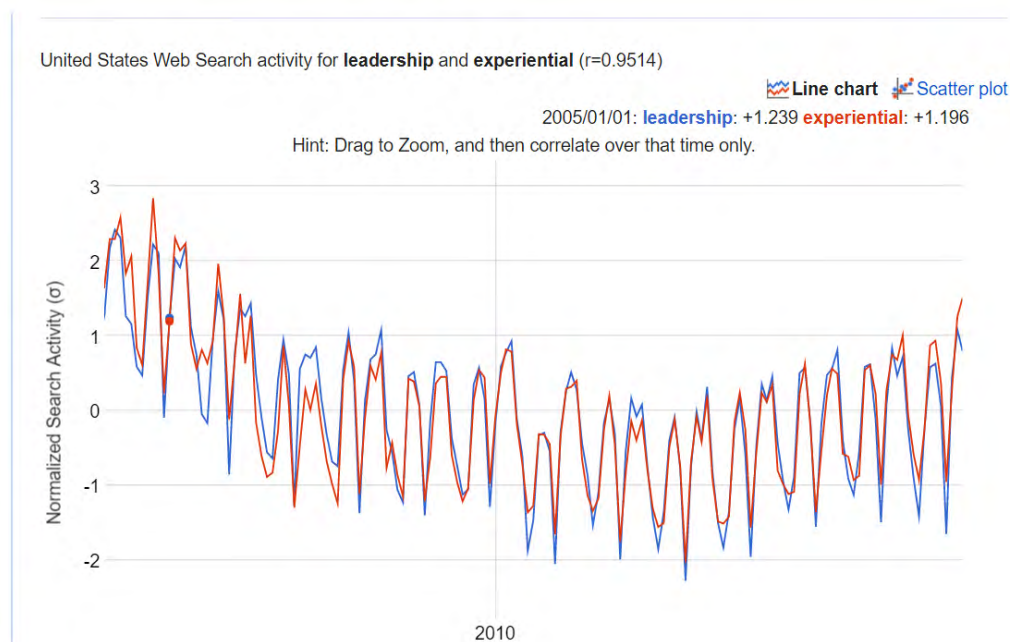
Figure 13. Monthly United States Web search activity comparing the terms leadership and experiential. Data source: Google Correlate (www.google.com/trends/correlate).

Table 9

Top Ten Google Correlate Results for Leadership – Geographic

r	Term
0.8577	leadership conference
0.8544	organization
0.8476	organizational
0.8208	small businesses
0.8129	the workforce
0.7955	strategy for
0.7926	needs analysis
0.7917	organizations
0.7893	discrimination act
0.7838	national center for education

Figure 14. United States Web search activity comparing terms leadership and leadership conference. Data source: Google Correlate (www.google.com/trends/correlate).

Google Trends. Figure 15 shows the top five related topics and the top five related queries for the term leadership as determined by Google Trends. These results also point to the similar findings produced by Wikipedia Pageviews and Google Correlate that information seeking on leadership conferences is correlated with information seeking on leadership in general.
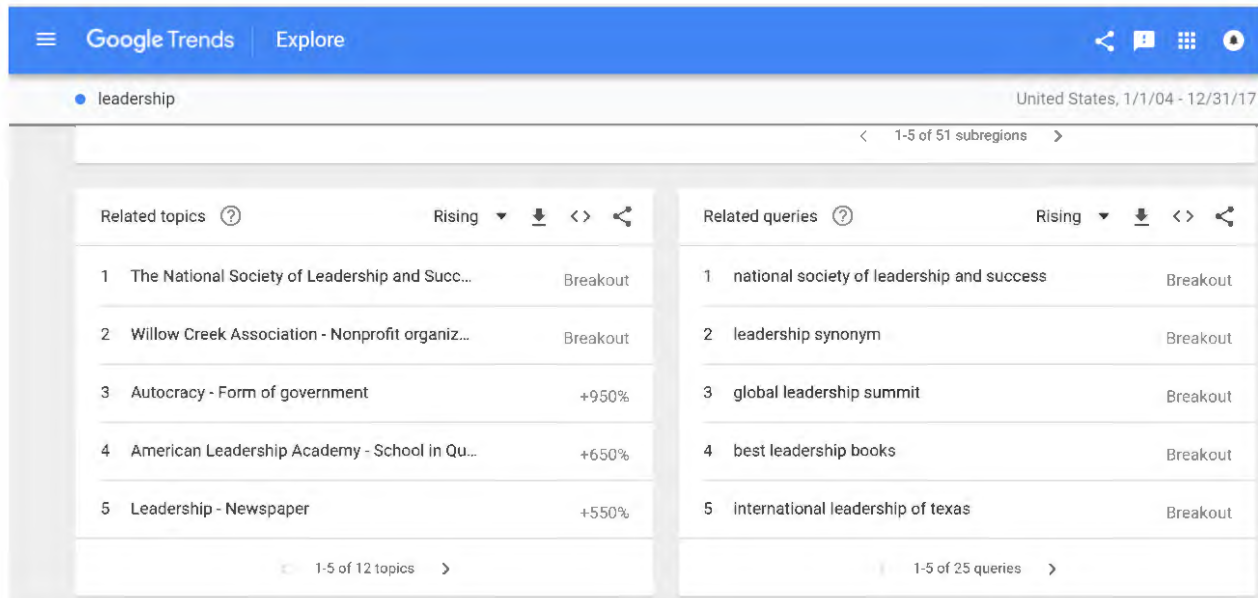
Figure 15. Top related topics and queries for leadership using Google. Data source: Google Trends (www.google.com/trends)

Analysis of Data

The data were analyzed using several strategies and included the following procedures:

1. Organized and grouped the data

2. Reported and displayed the reduced data

3. Analyzed the data to determine meaning

The data were first downloaded by using either a temporal filter query or a spatial filter query. In reference to time-related queries:

Interest over time: Numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. Likewise, a score of 0 means the term was less than 1% as popular as the peak. (Google, 2017b, sec. 1)

Distinctly, in reference to location-related queries:

Interest by subregion: See in which location your term was most popular during the specified time frame. Values are calculated on a scale from 0 to 100, where 100 is the location with the most popularity as a fraction of total searches in that location, a value of 50 indicates a location which is half as popular, and a value of 0 indicates a location where the term was less than 1% as popular as the peak. Note: A higher value means a higher proportion of all queries, not a higher absolute query count. So, a tiny country where 80% of the queries are for "bananas" will get twice the score of a giant country where only 40% of the queries are for "bananas." (Google, 2017b, sec. 2)

Data sets were exported using the filters shown in Table 10 in relation to the seven research questions. The data are displayed by a normalized score ranging from zero to 100. For example, the data for leadership queries by month for the year 2004 are shown in Table 11.

The data analysis process included organizing, reducing, analyzing, explicating, and displaying data collected. Descriptive statistics included frequency counts, percentages, means, measures of central tendency, and variability. The analyses centered on looking at relationships between the variables and an interest in leadership as measured by the proxy of Google Trends data. Predictor variables included the nominal and categorical variables of a specific state and the time of the year, as well as the variable of conservative-liberal score. The outcome variable was "interest in leadership" as determined by the discrete volume of Google queries.

Table 10

Data Sets

Research Question	Data Set
1	Sample of U.S. searches by month from 2004-2017
2	Sample of U.S. searches by month from 2004-2007 and 2014-2017
3	Sample of U.S. searches by state from 2004-2017
4	Sample of U.S. searches by state from 2004-2007 and 2014-2017
5	Sample of U.S. searches by low search volume cities and high search volume cities from 2004-2017
6	Sample of U.S. searches by high search volume cities in Florida and greater metro areas of Florida from 2004 to 2017
7	Sample of U.S. searches by city from 2004-2014 and measured score of city conservatism

Table 11

Google Trend for Leadership in 2004

Month	Trend Score
01	91
02	98
03	96
04	98
05	90
06	89
07	82
08	81
09	92
10	95
11	95
12	78

Non-parametric procedures utilized the one-sample Kolmogorov-Smirnov (K-S) test statistic. Parametric procedures utilized the *t* test of independent means and the Pearson product-moment correlation coefficient (*r*). An alpha level of $p < .05$ was used as the threshold for evaluating the statistical significance of findings.

Summary

This chapter contained an explanation of the methods used in a quantitative study of interest in leadership using Google Trends data as a proxy for user interest. Using the Google Trends instrument allows researchers to conduct an archive examination of online users' search behavior. This current study focused on aggregate, anonymous Google search data from users in the United States. The next chapter presents the results obtained using the abovementioned methods.

IV. RESULTS

The current study contains an examination of factors that are related to an interest in leadership by observing the online search behavior of Google users within the United States. Again, Google users' information seeking behaviors as measured by relative search volume was used as a modest proxy for leadership interest. The previous chapter contained an exploration of the volume of items retrieved from various Web queries for the term leadership. Results were displayed with recent outputs for Web sites such as Amazon, Wikipedia, YouTube, and Google. The current chapter contains analyses limited to data available from Google Trends. Online search data from Google Trends was downloaded for analyses. The analyses conducted delved into the temporal and spatial relationships among Google users in the United States and their interest in leadership as understood by previously mentioned assumptions (i.e., an online search for the term leadership represents an interest in the topic of leadership).

The current chapter is organized in terms of the seven research questions presented in Chapter One. Each section is then further segmented to provide three elements: (a) a generalization of the results, (b) a reference to any tables or figures provided, and (c) any specific evidence generated by the results. Throughout the following sections within this current study, leadership interest is measured by the relative search volume provided by Google Trends data. Again, this study did not intend to measure the intentions or discern the motivations of Google

users searching for the term leadership. This current study only measured the interest as determined by the Google searches.

Data Analyses and Findings by Research Question Posed

Research Question 1: Was interest in the topic of leadership, described as leadership interest, normally distributed during the time period of 2004 through 2017 using Google Trends? Google users in the United States from 2004 to 2017 gradually and slightly changed in their overall interest in leadership. Google users in 2004 appeared somewhat more interested in leadership compared to their counterparts in 2017, although this distinction was not statistically significant. As indicated in Figure 16, Google search rates for information on leadership remained fairly stable with overall rates gradually declining from 2004 to 2017. Table 12 shows descriptive statistics for the downloaded sample of Google searches for the time period of January 1, 2004, to December 31, 2017. Note that in the table, the highest month overall and the lowest month overall represent the combined total of all 13 years used in the study.
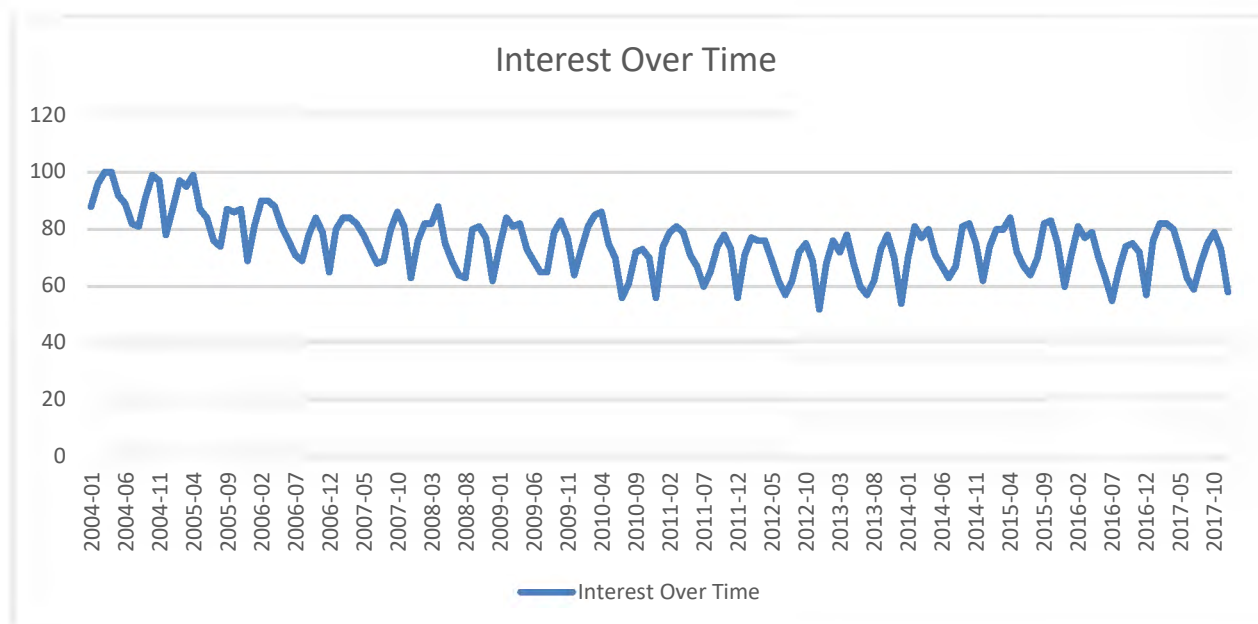
Figure 16. A sample of leadership interest over time from the time period of January 1, 2004, to December 31, 2017.

Table 12

Interest Over Time

Statistic	Value
Mean	75.11
Maximum	100 (March 2004, April 2004)
Highest Month Overall	April
Minimum	52 (December 2012)
Lowest Month Overall	December
Median	75
Mode	81
Range	48
Standard Deviation	10.10
Variance	101.92

A one-sample Kolmogorov-Smirnov (K-S) test statistic determined that interest in the topic of leadership was normally distributed during the time period of 2004 through 2017 using Google Trends (K-S $_{(168)}$ = 0.06; p = .20). The mean score for the distribution of leadership interest from 2004 through 2017 was 75.11 (SD = 10.10). The most frequently occurring (mode) level of interest during the time period of 2004 through 2017 was 81 (n = 11), closely followed by 82 (n = 9). The range of leadership interest during the time period of 2004 through 2017 was 48, with the high values of 100 manifested in both March and April of 2004 and the low value of 52 in December of 2012.

H$_0$1: The distribution of interest in the topic of leadership during the time period of 2004 through 2017 will not be statistically significant from normal using the Google Trends data platform.

Considering the non-statistically significant *K-S* finding in Research Question 1 affirming the normality of distribution of interest in the topic of leadership from 2004 through 2017 in Google Trends, the null hypothesis in Research Question 1 is retained.

Research Question 2: Was interest in the topic of leadership, described as leadership interest, statistically significantly different from the years 2004 through 2006 in comparison to the time period of 2014 through 2016 using the Google Trends data platform?

Google users during the time period of 2004 to 2006 changed in their relative interest in leadership compared with their counterparts during the time period of 2014 to 2016. The time period for which the data were obtained was measured from January 1, 2004, to January 1, 2007, and from January 1, 2014, to January 1, 2017. However, this research study identified the data set search periods as representing 2004 to 2006 and 2014 to 2016 respectively. January 1, as opposed to December 31, was the cutoff date due to how the data sets are batched and downloaded. On average, the search rates from 2004 to 2006 were higher than the search rates from 2014 to 2016. Table 13 shows descriptive statistics comparing the two time frames.

Using the t test of independent means to assess the statistical significance of mean scores between the two respective time frames on the topic of leadership interest, a search of the term leadership, on average, was greater during the time frame of 2004 to 2006 than was evident in the time frame of 2014 to 2016 (mean difference = 11.83). The mean difference in leadership interest with respect to time frame was manifest at a statistically significant level ($p < .001$). Moreover, the magnitude of effect (effect size) in the difference of mean scores favoring the time frame 2004 to 2006 is considered large ($\Delta = 1.03$). Considering the noteworthy difference in standard deviations (SD) between the two groups in the comparison, Glass' delta (Δ) was used to assess the magnitude of effect in Research Question 2. Table 14 contains a summary of findings with respect to the comparison of time frames regarding leadership interest using Google Trends.

Table 13

Compared Interest Over Time

Statistic	2004-2006	2014-2016
Mean	73.96	62.13
Max	100 (October 2004)	75 (January 2015, April 2015)
Highest Months	April	February, October
Min	35 (December 2006)	26 (December 2014)
Lowest Months	December	December
Median	76	65
Mode	76	69, 70
Range	65	49
Standard Deviation	11.51	9.76
Variance	132.46	95.75

Table 14

Comparing Leadership Interest Time Frames in Google Trends: 2004-2006 to 2014-2016

Time Period	n	Mean	SD	t	Δ
2004-2006	157	73.96	11.51	9.82***	1.03
2014-2016	157	62.13	9.76		

***$p < .001$

H$_0$2: Regarding interest in the topic of leadership, described as leadership interest, no statistically significant difference will exist from the years 2004 through 2006 in comparison to the time period of 2014 through 2016 using the Google Trends data platform.

Considering the statistically significant finding favoring the time frame of 2004 to 2006 in Google Trends, the null hypothesis in Research Question 2 is rejected.

Research Question 3: Was interest in the topic of leadership, described as leadership interest, normally distributed for states during the time period of 2004 through 2017 using Google Trends?

Google users in the United States showed varying levels of interest in leadership from state to state during the time frame of 2004 to 2017. Figure 17 shows a sample of the relative density of search volume for each state. Table 15 shows descriptive statistics for Google search rates for information on leadership by state.

A one-sample Kolmogorov-Smirnov (K-S) test statistic determined that interest in the topic of leadership was normally distributed for states during the time period of 2004 through 2017 using Google Trends (K-S $_{(51)}$ = 0.11; p = .19). The mean score for the distribution of leadership interest from 2004 through 2017 was 62.80 (SD = 8.51). The most frequently occurring (mode) level of interest during the time period of 2004 through 2017 was 66 (n = 5),
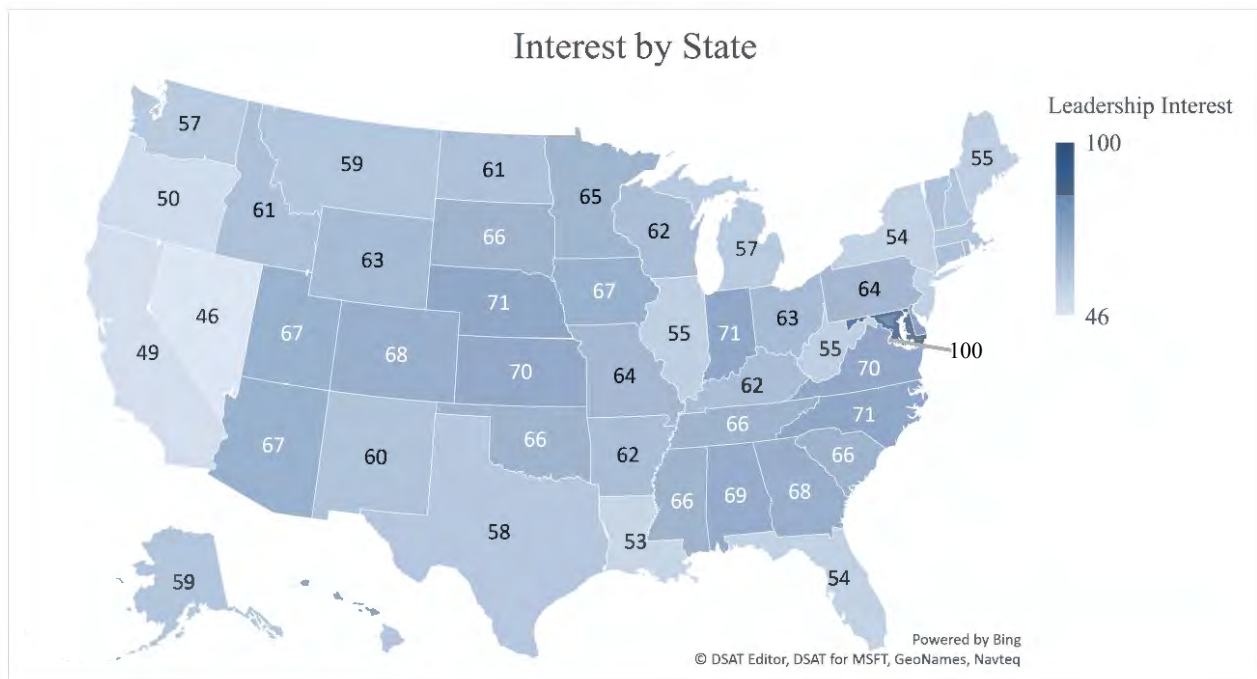
Figure 17. A sample of leadership interest compared by state from the time period of January 1, 2004, to December 31, 2017.

Table 15

Interest by State

Statistic	Value
Mean	62.80
Max (Highest State)	100 (District of Columbia)
Min (Lowest State)	46 (Nevada)
Median	62
Mode	66
Range	54
Standard Deviation	8.51
Variance	72.40

followed by 59 ($n = 4$). The range of leadership interest during the time period of 2004 through 2017 was 54, with the high values of 100 manifested in the District of Columbia and the low value of 46 manifested in Nevada.

H$_0$3: The distribution of interest in the topic of leadership during the time period of 2004 through 2017 by state will not be statistically significant from "normal" using the Google Trends data platform.

In view of the non-statistically significant K-S finding in Research Question 3 affirming the normality of distribution of interest in the topic of leadership from 2004 through 2017 in Google Trends by state, the null hypothesis in Research Question 3 is retained.

Research Question 4: Was interest in the topic of leadership, described as leadership interest, statistically significantly different for states during the time period of 2004 through 2006 in comparison to the time period of 2014 through 2016 using the Google Trends data platform?

Google users among different states during the time period of 2004 to 2006 changed in their interest in leadership compared with their counterparts during the time period of 2014 to 2016. The temporal output measured data from January 1, 2004, to January 1, 2007, and from January 1, 2014, to January 1, 2017. On average, the search rates from 2014 to 2016 were higher

than the search rates from 2004 to 2006. Table 16 shows descriptive statistics comparing the two time frames.

Table 16

Compared Interest Over Time by State

Statistic	2004-2006	2014-2016
Mean	58.35	48.35
Max	100 (District of Columbia)	74 (District of Columbia)
Min	43 (New York)	35 (Nevada)
Median	57	49
Mode	47, 52, 54, 59, 67	52
Range	57	39
Standard Deviation	10.60	6.63
Variance	112.39	43.99

Using the *t* test of independent means to assess the statistical significance of mean scores between the two respective time frames on the topic of leadership interest, search for the term leadership, on average, was greater during the time frame of 2004 to 2006 than was evident in the time frame of 2014 to 2016 (mean difference = 10.00). The mean difference in leadership interest with respect to time frame was manifest at a statistically significant level ($p < .001$). Moreover, the magnitude of effect (effect size) in the difference of mean scores favoring the time frame 2004 to 2006 is considered large ($\Delta = 0.94$). Considering the noteworthy difference in standard deviations (SD) between the two groups in the comparison, Glass' delta (Δ) was used to assess the magnitude of effect in Research Question 4. Table 17 contains a summary of findings with respect to the comparison of time frames regarding leadership interest using Google Trends.

Table 17

Comparing Leadership Interest Time Frames by State in Google Trends: 2004-2006 to 2014-2016

Time Period	*n*	Mean	SD	*t*	Δ
2004-2006	51	58.35	10.60	5.71***	0.94
2014-2016	51	48.35	6.63		

***p < .001*

H₀4: Regarding interest in the topic of leadership, described as leadership interest, no statistically significant difference will exist among the 51 states from the years 2004 through 2006 in comparison to the time period of 2014 through 2016 using the Google Trends data platform.

Considering the statistically significant finding favoring the time frame of 2004 to 2006 in Google Trends, the null hypothesis in Research Question 4 is rejected.

Research Question 5: Was interest in the topic of leadership, described as leadership interest, statistically significantly different for high search volume cities only in comparison to the inclusion of low search volume cities during the time period of 2004 through 2017 using the Google Trends data platform?

Google users in the United States showed differing levels of interest in leadership from city to city. Table 18 shows descriptive statistics for low search volume cities compared to high search volume cities.

When comparing the variable High Search Volume group to the variable Low Search Volume group by using the *t* test of independent means test statistic, the mean score difference of 3.52 was not found to be statistically significant (*p* = 0.15). Moreover, the comparison of Search Volumes yielded a small magnitude of effect (*g* = 0.23) favoring the High Search Volume group.

Hedges' *g* was the test statistic used to assess the effect size of the group comparison considering the unequal sample sizes manifested by High Search Volume and Low Search Volume groups. Table 19 contains a summary of the comparison between High Search Volume and Low Search Volume groups regarding the topic of leadership interest in Google Trends (2004 through 2017).

Table 18

Interest by City

Statistic	Low Search Volume	High Search Volume
Mean	48.35	51.86
Max (Highest City)	100 (Arlington, VA)	100 (Arlington)
Min (Lowest City)	7 (Milpitas, CA)	38 (Sacramento)
Median	46	48
Mode	47	41
Range	93	62
Standard Deviation	15.46	13.35
Variance	239.10	178.20

Table 19

Comparing Leadership Interest: High Search Volume & Low Search Volume Groups

Time Period	*n*	Mean	SD	*t*	*g*
High-Volume	50	51.86	13.35	1.46	0.23
Low-Volume	171	48.35	15.46		

H$_0$5: Regarding interest in the topic of leadership, described as leadership interest, no statistically significant difference will exist between the high search volume cities only in comparison to the inclusion of low search volume cities during the time period of 2004 through 2017 using the Google Trends data platform.

Considering the non-statistically significant finding in Research Question 5, the null hypothesis in Research Question 5 is retained.

Research Question 6: Was interest in the topic of leadership, described as leadership interest, statistically significantly different for high search volume cities within Florida only in comparison to the inclusion of greater metro areas in Florida during the time frame of 2004 through 2017 using the Google Trends data platform?

Google users in Florida cities showed differing levels of interest in leadership when compared to the greater metro areas (or media markets). Table 20 shows descriptive statistics for Florida cities compared to Florida greater metro areas.

Table 20

Interest by Region

Statistic	Florida Cities	Florida Metro Areas
Mean	31.38	62.90
Max (Highest Region)	100 (Eglin Air Force Base)	100 (Gainesville)
Min (Lowest Region)	24 (Windermere, Pembroke Pines, Opa-Locka, Winter Springs, Melbourne, Miami Gardens, Palm Beach Gardens, North Miami Beach)	40 (Mobile/Pensacola/Ft. Walton Beach)
Median	28.00	57.50
Mode	24	58
Range	76	60
Standard Deviation	11.89	18.32
Variance	141.26	335.66

Using the *t* test of independent means to assess the statistical significance of mean scores between the two respective sample areas on the topic of leadership interest, a search of the term leadership, on average, was greater during the time frame of 2004 to 2017 for those cities considered "Greater Florida Metro" than those considered "Florida Cities" (mean difference = 31.52). The mean difference in leadership interest with respect to the comparison of Florida Cities and Florida "Metro" Areas in the study's sample was manifest at a statistically significant level (*p* <.001). Moreover, the magnitude of effect (effect size) in the difference of mean scores favoring the time frame 2004 to 2017 is considered very large (*g* = 2.41). Hedges' *g* was used to assess the magnitude of effect in Research Question 6 considering the noteworthy differences in the sample sizes between the two groups in the comparison.

Table 21 contains a summary of finding with respect to the comparison of Florida Cities and Florida Metro Areas during the time frame of 2004 through 2017 regarding leadership interest using Google Trends.

Table 21

Comparing Leadership Interest in Google Trends: Florida Cities & Florida Metro Areas

Comparison	*n*	Mean	SD	*t*	*g*
Florida Cities	50	31.38	11.89	6.95***	2.41[a]
Florida Greater Metro Areas	10	62.90	18.32		

***p* < .001   [a] Very Large Effect Size (*g* ≥ 1.30)

H₀6: Regarding interest in the topic of leadership, described as leadership interest, no statistically significant difference will exist from the years 2004 through 2017 between Florida Cities and Florida Metro Areas using the Google Trends data platform.

In view of the statistically significant finding favoring the Florida Metro Areas in the study's sample, the null hypothesis in Research Question 6 is rejected.

Research Question 7: To what degree does the political preference of major U.S. cities associate with and predict interest in leadership in those cities represented in the study's sample from 2004 through 2014 using Google Trends and a city conservatism score?

Google users showed slightly different levels of interest in leadership when compared with their city's political preference understood by a conservatism score. Table 22 shows descriptive statistics for cities compared to their political score.

Table 22

Interest by City Conservatism Score

Statistic	Conservatism Score	Leadership Interest
Mean	-0.30	45.66
Max (Highest Region)	0.41 (Mesa, AZ)	100 (Arlington, VA)
Min (Lowest Region)	-1.0 (San Francisco)	29 (Los Angeles)
Median	-0.27	43
Range	1.41	71
Standard Deviation	0.32	12.82
Variance	0.10	164.40

Using the Pearson product-moment correlation coefficient (r) to assess the mathematical relationship between political preference and interest in the topic of leadership, the relationship is described as direct, weak, and statistically significant at a more liberal interpretation of $p < .10$ ($r = .22$). A correlation coefficient test statistic determined that political preference did represent a marginally statistically significant predictor of interest in the topic of leadership. The predictive model in Research Question 7 was considered marginally viable ($F_{(1, 59)} = 2.94$; $p < .10$). The independent predictor variable Political Preference accounted for 4.7% of the explained variance in the model's dependent variable Interest in Leadership ($R^2 = .047$).

Table 23 contains a summary of the predictive model's results with respect to the predictive findings for the variable Political Preference and the dependent variable of Interest in Leadership inherent in Research Question 7.

Table 23

Predicting Interest in Leadership by Political Preference in Google Trends

Model	β	SE	Standardized β
Interest in Leadership	48.22	2.20	
Conservatism Score	8.64	5.04	.22*

*$p < 0.10$

H₀7: The variable Political Preference will not represent a statistically significant predictor of the variable Interest in Leadership in the time frame of 2004 through 2014 using Google Trends.

Considering the marginally to non-statistically significant finding regarding the predictive ability of the variable Political Preference for the variable Interest in Leadership, the null hypothesis for Research Question 7 is retained.

Summary of Results Obtained

The results presented in this chapter indicated that an interest in leadership using Google peaks at certain times of the year and that an interest in leadership is more concentrated in certain states than others. In other words, observable trends and patterns in leadership interest are evident among Google users in the United States. A more detailed summary and a discussion of the findings are presented in the next chapter.

V. DISCUSSION

As previously mentioned, this study was conducted to explore the relationship between online search behavior and interest in the topic of leadership. The final chapter of the dissertation restates the research problem and reviews the methods used in the study. In the major sections of this chapter, the results are summarized, and their implications are discussed.

Restatement of the Problem

Given the lack of research on and limited understanding of what factors are related to a person's interest in leadership, Google Trends data was used as a proxy to explore temporal-spatial variables as they relate with an interest in leadership. As explained in Chapter One, the research was a descriptive, comparative, and correlational study of interest in leadership within the United States using Google Trends data. As a comparative and correlational study, this researcher primarily used a quantitative perspective, attempting to observe relationships between Google users and their patterns of interest. The study covered search trends from January 1, 2004, to December 31, 2017.

Review of the Methodology

The study relied chiefly on aggregated, anonymous, archived data sets from Google Trends. Google search data was obtained for the time period of 2004 to 2017 within the United States. Statistical tests were used to determine temporal-spatial patterns of interest among

Google users. A one-sample K-S test was used for Research Questions 1 and 3; an independent *t* test was used for Research Questions 2, 4, 5, and 6; and a Pearson correlation coefficient was used for Research Question 7.

Researcher's Insights and Summary of Results

Based on this study alone, the factors accounting for a person's interest in leadership are difficult to ascertain. However, this research does suggest that trends exist, both with the time of the year and the geographic region, that relate to an interest in the topic of leadership within the context of Google Search. In other words, consistent times of the year and specific locations show a higher relative rate of search volume for the term leadership. These higher rates suggest a higher overall interest in leadership as compared to other times of the year and other spatial locations. Although, the overall trends may also be impacted by the changing cultural expressions of interest. As information seeking behavior changes, Google Trends may prove less valuable as an independent measure. For example, as leadership search interest seems to have declined within the Google framework over the past decade, it appears that searches for leadership material have exponentially increased on YouTube and other video sharing platforms. Therefore, it may not be the general interest in leadership that has changed, but rather the preferred medium for accessing leadership material has changed.

Nevertheless, temporal-spatial patterns of interest in leadership among Google users appear to be evident throughout the study's data sets. Observing online search behavior across the United States from 2004 to 2017 revealed consistent peaks and dips in overall search volume. These patterns and trends are further discussed in the next section, which is organized by research question.

Discussion and Interpretation of Findings by Research Question

In the following subsections, the study's findings and meanings are reflected on by research question. Each subsection is presented in three parts:

1. A re-statement of the research question

2. A summary of the research question findings

3. A discussion of the research question findings

Research Question 1: Was interest in the topic of leadership, described as leadership interest, normally distributed during the time period of 2004 through 2017 using Google Trends?

Taking into consideration the non-statistically significant K-S finding in Research Question 1, affirming the normality of distribution of interest in the topic of leadership from 2004 through 2017 in Google Trends, the null (H_01) hypothesis in Research Question 1 was retained. This researcher could not conclude that there was a significant difference in the distribution of interest in leadership over time. This conclusion makes sense and lends itself to the overall impression that the peaks and pits of interest remain fairly consistent from year to year.

The distribution of interest in leadership was normal and mostly stable from the time period of 2004 to 2017, with a mean relative search volume of 75.11 out of 100 and a low relative volume of only 52 out of 100. A low search volume rate of only 52 suggests that overall interest in leadership, even at its lowest points, does not fall below half of peak interest rates. However, different data samples may produce slightly different results and may show low search volume rates as either above or below the mid-point. Nevertheless, the relative search volume for the term leadership appeared to remain relatively strong throughout the years.

The four months with the highest search rates in order from the highest to lowest were April, February, March, and October. Search rates consistently peaked during these months from year to year. This finding suggests that relative interest in leadership was highest during spring and autumn, especially the early spring months. Two possible main explanations for this consistent trend emerged. First, these months may correspond with the collegiate academic schedule, showing that students in leadership programs are searching at higher volumes when taking relevant courses and perhaps preparing for exams or papers. In addition, interest may increase when prospective students are contemplating enrollment in a leadership program for an upcoming academic semester. Second, these months appear to correspond with a few key annual leadership conferences that take place in the United States. A simple Google search for annual leadership conferences revealed several conferences which are in line with the peak search months for leadership. For example, Table 24 displays a list of leadership conferences with their corresponding locations and dates.

The four months with the lowest search rates in order from the lowest to highest were December, July, August, and June. Search rates consistently dipped during these months. The simplest explanation for these dips in search volume is that they correspond with the winter and summer break schedule for school. Students are not in class and therefore are not as likely to need to search for information on leadership. Furthermore, most search terms are likely skewed during the month of December due to the holiday season and Christmas online shopping. Summer vacation searching may also play a role in skewing the summer month search rates. Again, important to remember is that these numbers represent relative search volume rates, which means that the total search volume may not be changing that drastically overall. However,

the data indicate that, with the increased search rate activity for holiday shopping and summer vacationing, the relative search volume for leadership is lower.

Table 24

Leadership Conferences

Conference	Location	2018 Dates
IAB Annual Leadership Meeting	Palm Desert, CA	February 11-13
Digital Strategy Innovation Summit	New York, NY	February 27-28
Breakthrough Annual Leadership Conference	Dallas, TX	March 4-7
The Economist Events' Innovation Summit	Chicago, IL	March 22
The CMO Club Summit	Marina del Rey, CA	April 18-19
Collision	New Orleans, LA	April 30-May 3
Leadercast	Alpharetta, GA	May 4
Forbes Under 30 Summit	Boston, MA	September 30-October 3
WORLDZ	Los Angeles, CA	October 17-18
Strategic Growth Forum	Palm Springs, CA	November 7-11
MASB Annual Leadership Conference	Grand Rapids, MI	November 9-11
World Business Forum	New York, NY	November 14-15

Overall, the data suggest that leadership is consistently a topic of interest among Google users in the United States. Google users appear especially interested in leadership as it corresponds to their school coursework and to annual leadership conferences. Google Trends offers a predictive tool for university and business recruiters looking for candidates interested in leadership. By capitalizing on the high search rate months, recruiters can optimize their efforts and receive a greater return on their marketing and recruiting investment. Organizations will most likely want to concentrate their advertising during the spring and autumn months, while conserving their resources during the summer and winter months.

Research Question 2: Was interest in the topic of leadership, described as leadership interest, statistically significantly different from the years 2004 through 2006 in comparison to the time period of 2014 through 2016 using the Google Trends data platform?

Taking into account the statistically significant finding favoring the time frame of 2004 to 2006 in Google Trends, the null (H_02) hypothesis in Research Question 2 was rejected. Therefore, this study concluded that there was a significant difference between the two separated time sets, a finding that makes sense because the past two decades have seen a drastic and accelerated change in technology and use of the Internet. The number of and type of users browsing the Web today are often categorically different than early adopters (as explained in Roger's concept of diffusion of innovations) of the Internet (Rogers, 2003).

The mean of the three-year span of 2004 to 2006 was 73.96, with the highest overall week being in October of 2004 (100) and the lowest overall week being in December of 2006 (35). In contrast, the mean of the three-year time span of 2014 to 2016 was 62.13, with the highest overall week being in January of 2015 (75) and the lowest overall week being in December of 2014 (26). These results indicate that the peak popularity of the term leadership during the 2014 to 2016 time frame was relatively 25% less popular compared to the peak interest during the 2004 to 2006 time frame.

The overall search trends represented by the two temporal data sets corroborate with the results in Research Question 1. The trend line is similar with consistent highs and lows. The high search volume and low search volume months during the 2004 to 2006 time frame were comparable to the high search volume and low search volume months during the 2014 to 2016 time frame. However, results indicate that the search volume for the term leadership a decade ago was relatively higher than more current search volumes. This change in relative search

volume would suggest that overall public interest in leadership has fallen over the past 10 to 15 years.

However, considering what Google Trends is attempting to measure, the narrative becomes more complicated than a simple interest shift. Possibly the best interpretation for the change in relative search volume is the change in the overall makeup of online searchers. The demographics of Internet users has drastically shifted over the years. In earlier years, the accessibility of the Internet was reserved more for the wealthy and the intellectuals. In contrast, today's access to the Internet has become much easier and more affordable. Therefore, the data may not be best interpreted in terms of the population losing interest in leadership. The same groups of people—such as college students and business people—are very likely searching for information on leadership and are still doing so in relatively similar volumes. What has changed is that more people are increasingly online today searching for increasingly more topics. For example, middle schoolers may be searching for information on the newest video game release, farmers in rural settings may be searching for weather patterns and climate conditions, or Internet novices may be searching for whimsical cat videos. These increased search volumes for various other topics will naturally diminish the relative search volume for any other specific topic such as leadership. For example, the massive increase of online shopping during the holiday season impacts the relative search volume of other topical searches such as leadership. In other words, the concentration of users searching for the term leadership in the month of April is higher than the concentration of users searching for the term leadership in the month of December.

Another caveat worth noting here is that the way people use the Internet has also changed over time. By extension, the way people consume information has changed. This change can be

seen by how interest in leadership seems to have increased on other Internet platforms such as with the number of resources available on Amazon or the increased video searches on YouTube. Consider how smartphones have dramatically shifted the landscape of digital access and content, and yet, the first three-year timespan occurred before the release of the first iPhone in 2007. The reality may be that interest in leadership has not changed significantly at all, but rather the way information on leadership is sought has changed. Many online users would rather view a video on leadership than read an article on the subject. One very popular forum for leadership material is with the TED Talks series which can be viewed from YouTube or from the TED Talks Web site directly.

Overall, the data may suggest that leadership is consistently a topic of interest among certain Google users in the United States, but this relative interest has been reduced by an increase in overall online users. Google Trends can help schools and organizations see which months are best suited for recruiting candidates interested in leadership. Perhaps more importantly, however, Google Trends in coordination with other Google business tools, such as AdWords, can offer organizations better insight and resources into how to market to Google users. For example, accessing Google Ads' Keyword Planner tool revealed that the term leadership had an average monthly range between 100,000 and one million searches since September 2014 and that the relative competitiveness of advertisers bidding on the keyword term was considered low (Google, 2018c). Organizations will not only want to direct their advertising efforts towards specific months of the year, but they will also want to increase their advertising investment into specific online user profiling. By connecting search terms related to an interest in leadership, organizations can ensure that Google users most likely to respond to their advertising are the ones who are being shown their specific ad campaigns. For example,

recruiters may want to pay for an online ad campaign during the month of April that is targeted only to Google users who search for keywords such as leadership, management, business, or conference. Finally, organizations will want to invest more resources into other mediums such as posting videos on YouTube or utilizing social media platforms to cater to the ever-changing demographics of the market.

Research Question 3: Was interest in the topic of leadership, described as leadership interest, normally distributed for states during the time period of 2004 through 2017 using Google Trends?

In view of the non-statistically significant K-S finding in Research Question 3, affirming the normality of distribution of interest in the topic of leadership from 2004 through 2017 in Google Trends by state, the null (H_03) hypothesis in Research Question 3 was retained. Therefore, this current researcher could not conclude that there was a significant difference in the distribution of interest in leadership across states. This finding is not surprising because, although the nature of the Internet has changed radically over time, the layout and characteristics of each state have not shifted as dramatically. The changing of society and culture may be a much slower process than the changing of technology.

The distribution of interest in leadership was normal and fairly stable throughout the time period of 2004 to 2017, with a mean relative search volume of 62.80 and low relative volume of 46 represented by Nevada. Results indicate the high search rate states have remained high and the low search rate states have remained low. The five areas with the highest search rates from highest to lowest were the District of Columbia, Maryland, Delaware, North Carolina, and Nebraska. The five states with the lowest search rates from lowest to highest were Nevada, California, Oregon, Louisiana, and New York.

One interesting observation from this sample was that of the District of Columbia with a relative search rate volume of 100 (the max score), which was 20 points higher than Maryland, the second highest. When various spatial queries were run with Google Trends, the District of Columbia consistently returned as an outlier. This phenomenon is probably easiest explained by the fact that the District of Columbia is the nation's capital. High interest in leadership is reasonable due to the disproportionate number of politicians, policymakers, business lobbyists, and other leaders who reside within the nation's capital. This outlier was not dealt with directly in this current study, but it is something to hopefully be addressed in future research.

Another noteworthy observation was in the low scores of the states of California and New York. These results may appear surprising at first because of the large population and the political influence of these states. However, these states' high populations may offer a reasonable explanation for their low leadership interest scores. More than in other states, the overall relative search volume would likely be brought down in these states as the population layout consists of a greater diversity of people searching for a greater diversity of topics. In contrast, it may also be argued that these states' citizens simply possess a lower interest in leadership due to some socio-cultural phenomenon. The discrepancy between high population states and low leadership interest is a topic for future research.

Research Question 4: Was interest in the topic of leadership, described as leadership interest, statistically significantly different for states during the time period of 2004 through 2006 in comparison to the time period of 2014 through 2016 using the Google Trends data platform?

Considering the statistically significant finding favoring the time frame of 2004 to 2006 in Google Trends, the null (H_04) hypothesis in Research Question 4 was rejected. Therefore, this current study concluded that there was a significant difference among states between the two

separated time sets. This finding is not surprising as it is consistent with the findings of Research Question 2.

The mean of the three-year span of 2004 to 2006 was 58.35, with the highest overall search rate occurring in the District of Columbia and the lowest overall search rate occurring in New York. In contrast, the mean of the three-year time span of 2014 to 2016 was 48.35, with the highest overall search rate appearing in the District of Columbia and the lowest overall search rate appearing in Nevada.

Again, results from Research Question 4 are consistent with results from Research Question 2 in that the relative search rate volume was higher overall during the time period of 2004 to 2006. This difference can be seen, for example, with the District of Columbia which saw its highest rates during the 2004-2006 time period with a max score of 100. In comparison, the District of Columbia's relative search rate during the 2014-2016 time period was only 74. As stated in Research Question 2, as the demographics of Google users has changed over time, so has the relative search volume of certain topics. The state with the greatest difference in relative search rate was North Dakota which went from a score of 75 during the 2004-2006 time period to a score of 45 during the 2014-2016 time period. Four states showed an increased relative search rate volume, but these increases were small, only ranging from one to four points. The state with the greatest increase in relative search rate was Utah which went from a score of 49 during the 2004-2006 time period to a score of 53 during the 2014-2016 time period. Only one state, Wisconsin, showed no change in relative search rate with a steady score of 49. To better explain these results, future researchers may want to focus on individual states and their unique profiles.

Research Question 5: Was interest in the topic of leadership, described as leadership interest, statistically significantly different for high search volume cities only in comparison to the inclusion of low search volume cities during the time period of 2004 through 2017 using the Google Trends data platform?

Considering the non-statistically significant finding in Research Question 5, the null (H_05) hypothesis in Research Question 5 was retained. Therefore, this researcher could not conclude that there was a significant difference between search rates for high-volume cities and low-volume cities. This finding is not surprising because both data sets were based upon the same source and used the same calculations to convert search rates into normalized scores. The only difference between the two sets was the search volume threshold that is used to pull in the data points of interest. All 50 cities from the high-volume data set are also included in the low-volume data set, which consists of 171 cities total, yet many of the 50 high-volume cities would have a slightly different scaled score when combined with the low-volume cities.

The five high search volume cities with the highest scores in order from highest to lowest were Arlington, VA (100); College Station, TX (93); Tallahassee, FL (78); Durham, NC (70); and Greensboro, NC (69). The five high search volume cities with the lowest scores in order from lowest to highest were Sacramento, CA (38); Atlanta, GA (39); St. Louis, MO (39); New Orleans, LA (39); and San Antonio, TX (40). The five low search volume cities with the highest scores in order from highest to lowest were Arlington, VA (100); College Station, TX (94); College Park, MD (93); West Lafayette, IN (87); and Hyattsville, MD (83). The five low search volume cities with the lowest scores in order from lowest to highest were Milpitas, CA (7); Sterling, CO (9); Brookneal, VA (13); Hialeah, FL (20); and Boardman, OR (27). When comparing the same cities from both the high-volume and the low-volume sets, there was not

much difference in relative score; scores were usually only one point different, if any, and never more than two points.

Results indicate that adjusting Google Trends to retrieve either high search volume or low search volume cities does not greatly impact the relative search rates of individual cities. However, what is altered is the sheer number of cities that can be viewed for analysis by Google Trends. The high search volume city only output in the current study provided 50 cities, while the low search volume city output provided 171 cities. A difference in sample sizes might mean that many cities have a relatively high interest in leadership when compared to other cities but that these cities may not traditionally be considered in marketing ventures. These low search volume cities could include many smaller townships which may not be targeted for leadership recruiting but may nevertheless have the potential for a high return on investment for recruiting. For example, the city of College Station, TX, has a population of over 110,000 and ranks high in both the high search volume set and the low search volume set. In contrast, the city of State College, PA, does not rank in the normal, high search volume data set most likely due to the city's population being less than 42,000. However, when including the low search volume results, State College becomes the tenth highest ranked city, with a score of 77. Worth noting, however, is that in this example, both cities are home to large, reputable universities (Texas A&M University and Penn State University, respectively), which helps to explain the high search rate scores. Nevertheless, the example above shows that there may be other extenuating circumstances that initially hide the leadership recruiting potential of certain areas. Organizational leaders should take such variables into consideration.

Research Question 6: Was interest in the topic of leadership, described as leadership interest, statistically significantly different for high search volume cities within Florida only in

comparison to the inclusion of greater metro areas in Florida during the time frame of 2004

through 2017 using the Google Trends data platform?

In view of the statistically significant finding favoring the variable Florida Metro Areas in

the study's sample, the null (H_06) hypothesis in Research Question 6 was rejected. Therefore,

this current study concluded that there was a significant difference in leadership interest of

Florida cities when compared to Florida media market regions. This finding is not surprising

primarily because of the difference in sample sizes and the difference in geographic area of the

two data sets.

Similar to Research Question 5, results should be interpreted in light of the large

difference in sample size. The city output consisted of 50 cities while the metro area output only

consisted of ten areas, which represent Florida's ten media markets as determined by Nielsen.

These metro areas consist of the 50 reported cities and in total make up the entire state of Florida

(as well as small portions of Alabama and Georgia). Additionally, the designs of the media

markets are very different than the older designs of municipalities, and, therefore, it is reasonable

that these two data sets would produce different results. Also important to note is that the city

data set showed a large outlier with the Eglin Air Force Base, which had a max score of 100,

compared to the second highest city of Tallahassee, which only had a score of 50.

An interesting observation from the data is that the media markets have a smaller range

than the individual cities. For example, the city of Gainesville had a score of 43, while the media

market for the Gainesville region had a max score of 100. Intriguing here is that Gainesville,

home of the University of Florida, as a city does not appear to be the driving force in the

Gainesville media market for interest in leadership. Explanations for this finding are vast, but

perhaps the University of Florida has a large commuting population that is spread out within the Gainesville metro region.

Consistent with the test results, this contrast also shows that individual cities can vary in leadership interest from city to city while the metro areas show a much more general trend for the divided media markets. For example, Crystal Lake (48), with the third highest score, and Lakeland (29) are located beside each other and yet have 17 other cities ranked between them when evaluating online leadership interest. Perhaps worthy of mention is that the Crystal Lake area is home to Southeastern University, which has a strong leadership program and from which this current study is homed. The metro area for which these cities are located, the Tampa media market, had a score of 58 and is the fourth highest. This difference in relative search volume helps to explain why the mean for the media markets is essentially double that of the cities.

These results suggest that organizations may want to invest more resources into smaller, localized recruiting efforts. Marketing and advertising often rely on the distinguished media markets to strategize their campaigns. However, the results of this study show that individual cities within the same media market can have greatly different interest levels, and, therefore, those cities are likely to have different response rates. It is not enough to simply recruit at the University of Florida because of its size and leadership programs. The surrounding community has a bigger story to tell, and if researchers can zoom in on key hot spots of interest, then they will benefit from the law of supply and demand by catering to a thicker market.

Research Question 7: To what degree does the political preference of major U.S. cities associate with and predict interest in leadership in those cities represented in the study's sample from 2004 through 2014 using Google Trends and a city conservatism score?

Considering the non-statistically significant finding regarding the predictive ability of the variable Political Preference for the variable Interest in Leadership, the null hypothesis (H_07) for Research Question 7 was retained. Therefore, a significant correlation between city conservatism and leadership interest could not be determined. This finding is in corroboration with other observations using Google Trends as is further discussed below.

Conservatism score, as measured by Tausanovitch and Warshaw (2014), of the cities studied showed a mean of -0.30 within a normalized range of -1.0 to 1.0. The most conservative city analyzed was Mesa, AZ, with a value of 0.41, and the most liberal city analyzed was San Francisco, CA, with a value of -1.0. The leadership interest score, as measured by Google Trends, showed a mean of 45.66, with Arlington receiving a peak value of 100 and Los Angeles receiving the lowest reported value of 29. According to the current study's determined threshold for significance, the relationship between city conservatism and interest in leadership is non-statistically significant ($r = .22$; $p < .10$). With a positive r value and $p < .10$, the results could be argued as approaching significance in favor of conservative cities being more interested in leadership. However, Figure 18 shows that overall, the cities can range drastically. More research is needed in this area. In particular, researchers will benefit from looking more into different settings such as smaller cities and rural areas.

As mentioned, the non-significant finding comes as little surprise. Throughout the course of utilizing Google Trends to evaluate leadership interest, there appear to be far more important factors than a city's conservatism. In this vein, several considerations arise.

For one, a city's conservatism does not necessarily and directly represent the population's conservatism, although the two may be related. The city's political preference is more of a proxy

for the overall political culture of the given population. By this observation, determining how an individual's political preferences may play a role in leadership interest may prove difficult.

Secondly, Research Question 7 focused on major U.S. cities with populations of 250,000 or more. The fact that a city's conservatism score did not show statistically significant differences in interest in leadership may have resulted from the tendency of more populous cities to already lean toward one side of the political spectrum. As noted in Chapter Three, these major cities by nature tend to be more politically liberal. Even Mesa, AZ, the most conservative city analyzed, only held a conservatism value of 0.41. To further illustrate this point, of the cities evaluated, around 80% were below zero, signifying a more liberal political preference, compared to the roughly 16% of cities with a value above zero. Only two cities measured—Fort Worth, TX, and Fresno, CA—had a conservatism score of zero. Since, in general, larger cities already share a lot in common regarding political ideologies, finding that a variable such as leadership interest was not significantly different is not surprising.
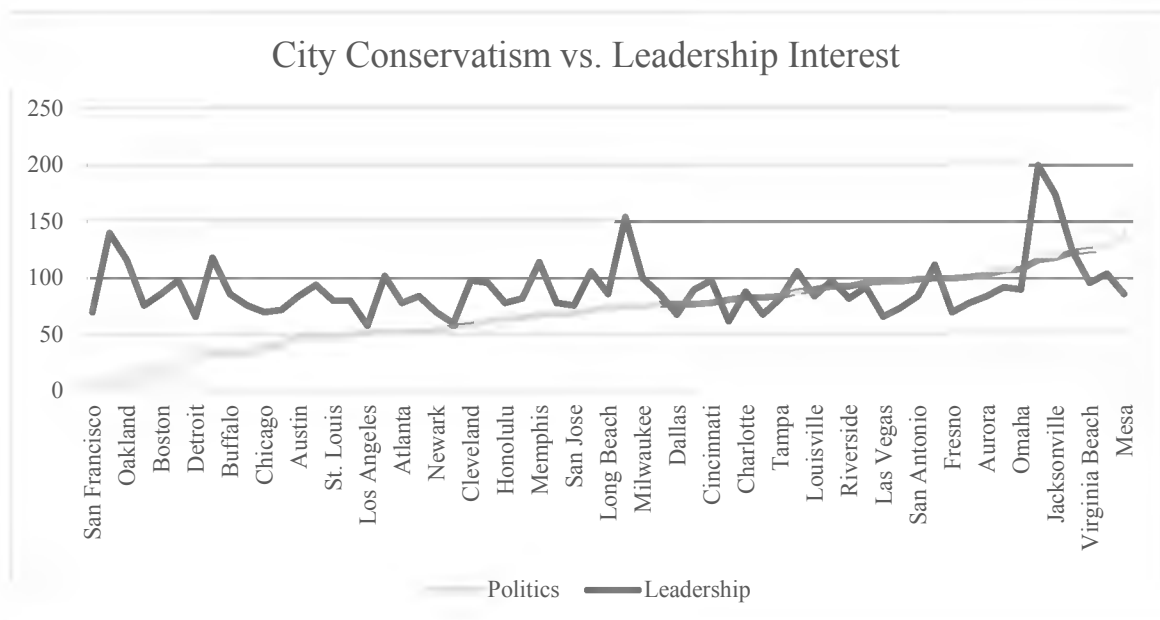

Figure 18. Overlapping trend lines for cities' Political Preference score and Leadership Interest score.

Lastly, interest in leadership appeared to be far more related to certain municipal characteristics other than political preference. One such characteristic was whether the city is a capital. Of the sample set of 61 cities used in this analysis, 11 cities were state capitals, six of which were at or above the median score. Other considerations include whether the city is home to a military base or a university. From that observation, it is logical to assume that universities, especially ones with strong leadership programs, will naturally boost the overall interest rate in leadership within a given area.

Limitations of the Study

As noted in Chapter One, what may be considered a key limitation on the method is that raw data are not made readily available for collection and analyses. Instead, Google Trends converts a sample of the data into standardized scores based upon relative search volume over time and space. Furthermore, as the ubiquity of the Internet and the proliferation of Google has increased over the years, the essential composition of searchers has changed. This shifting dynamic should be considered in any interpretation of the results.

The research design is also limited in that there is an observed degree of measurement error between the downloaded samples of query data. The differences do not appear to be large, but they do exist since Google Trends reports only a sample of all available search requests. This computed sampling method could possibly cause a non-representative sampling bias (Cavazos-Rehg et al., 2015). Since the output may vary somewhat from day to day, additional noise—variables that can impact and muddle the interpretation of results—is present in the data (Choi & Varian, 2009a). Overall, complications can arise in analyzing the data from rounding, normalizing, and sampling (Stephens-Davidowitz, 2013a).

Nevertheless, the sample population Google Trends reports from is still very large and arguably representative of the general population despite any variations in multiple downloads. Determining the exact measurement error will be of benefit in future studies. To help resolve this issue, future researchers can follow previous literature in characterizing the measurement error by downloading multiple occasions of the keyword series and determining the distribution. Carriere-Swallow and Labbe (2013) addressed this sampling noise:

> An important characteristic of the data is that Google employs a sampling procedure that introduces measurement error into the series. Requests for an identical query on different days return slightly different series, while queries sent on the same day produce identical series. This suggests that the sampling takes place once per 24-hour period.…It is worth bearing in mind that the strength of our results could be improved if Google were to make cleaner data available in the future. (p. 291)

Another limitation of the study is that the data cannot speak to the motives and intentions of the users conducting Google searches. Researchers cannot know why the searches were conducted, only that they were conducted and how those searches related to other searches. Determining intentions from mere interest is not feasible. To recapitulate, the study is limited by what Google knows about and provides about the inquirer, which includes only certain demographics such as when and where the search originated. For this reason, alternative explanations should be explored when analyzing Google search data. Changing media attention is one such variable that can drastically impact terms' relative popularity at any given moment, which increases the potential for false alerts in analyzing Web query data. "Google data can most fruitfully be used when combined with other data sources. If both Google searches and an

extreme, always-reported outcome show similar trends, this is more convincing evidence than either data point alone can provide" (Stephens-Davidowitz, 2013a, p. 95).

One other notable limitation to the use of Google search data is in conducting international research. For various and differing reasons, Google is not the dominant search engine in several countries such as China, Japan, South Korea, and Russia. Furthermore, Google Trends does not display the results for the same term(s) in different languages.

Implications

Theoretical Implications of the Study

Theories of personalities would predict that certain personality types are more inclined to an interest in leadership than others. However, this study shows that factors influencing interest may be more complicated. Of the biological, psychological, sociological, and ecological factors that influence a person's interest in leadership, this study primarily evaluated ecological factors—which includes the times and places of a person's interest. Most significant, this study affirms ecological systems theory in that it shows a clear temporal-spatial pattern of interest in leadership. The complex, intra- and interrelated ecological spheres that a person exists in can inform, impact, and influence the way he or she understands and interacts with the world and its people. Referring specifically to the exosystem and the chronosystem, this study seems to indicate that a person's environmental contexts are a measurable factor in indicating leadership interest.

However, these facets of time and place also connect with the psychology and the sociology of a person. For example, overall leadership interest consistently dropped during the holiday season, signifying a sociological phenomenon as American culture follows the pre-established norms of participating in the season. Moreover, where a person lives may further

influence his or her leadership interest as some areas may jointly celebrate the holidays more than others. Gaining a better understanding of when and where people are interested in leadership can aid researchers in discovering who potential leaders are.

Additionally, two questions arise as they pertain to the temporal-spatial context of this study: (a) Does generational identity play a role in leadership interest? and (b) Do hometown and culture play a role in leadership interest? The current study possibly helps allude that age and culture can play a role in leadership interest, but to what extent is yet to be seen. To extrapolate, the results of this study showed that interest in leadership using Google has changed over time and differs from region to region. Part of this difference may be explained by the differences in age and culture of those searching for information. For example, it might be proposed that younger people are less interested in leadership today. On the contrary, it may also be argued that younger generations simply seek out information differently such as with YouTube and TED Talk videos. Exploring such divisions in the data and the demographics of users was beyond the scope of this current study. Future research can be conducted to better parse out the differences.

The age of a person may contribute to his or her overall interest in leadership. For example, whether a person identifies more as a Baby Boomer, a Gen Xer, or a Millennial may make a difference in leadership interest. Google Trends may be used to help evaluate the impact of generational identity on leadership interest. To accomplish this task, researchers will need to look for ways of demarcating Google users into their different generational sets. One potential way of evaluating the merit of an age variable would be to combine local census data with Google data.

The area in which a person is raised and the main culture he or she identifies with may also contribute to his or her overall interest in leadership. Growing up in either the New England

area, the Deep South, the Midwest, or the Frontier states may impact a person's leadership interest. Here too, is no easy task in determining what percentage of Google users in a given area also identify with any certain culture. Nevertheless, mere geographic proximity may still be a helpful determination for whether a person is more or less likely to be interested in leadership.

Implications for Professional Practice

Although a single study cannot provide a sound basis for the practice of leadership recruitment, this study (along with future studies with similar findings) would suggest that certain times of the year and certain geographic regions are more receptive to leadership inquiries and thus may yield a higher return on investment in leadership recruitment. This professional implication is far more straightforward than the theoretical one. Practitioners can utilize Google Trends and the information in this study to better determine when and where to look for potential leaders.

Some of this trend information is intuitive and has already been in circulation for decades. For example, businesses have traditionally known to look to particular universities for their employment candidates. However, some results are perhaps less intuitive. For example, researchers and practitioners may explore how investing more resources into many smaller areas of interest around the country may be more efficacious than investing into a few larger cities such as New York and Los Angeles. As discussed in the results for Research Question 6, practitioners will want to focus on very specific areas to maximize their return potential rather than just ambiguously selecting mass media markets. Also worth noting is that leadership interest within capital cities and cities with universities may not be limited to just the politicians and the academics. The political and educational settings of these areas with their emphasis on leadership may essentially, by proxy, create more of a general public interest in leadership. The

soccer mom who drives her kids to practice every day and passes a university billboard advertising that she too can "be a leader" may be inspired to pursue a leadership role within the local Parent Teacher Association. In other words, certain areas may create a leadership interest by osmosis.

However, professionals should also use caution and implement a degree of self-reflection before building recruiting strategies based on these data. For one, recruiters should not use these data to discriminate against potential students and employees. Secondly, a danger looms with the potential of empowered groups using big data to manipulate their public image or to deceive customers and shareholders (Madrigal, 2018; Swisher, 2018).

Finally, this study presents a unique opportunity to explore potential methods for recruiting students and employees based on their preexisting interests. Interest, after all, is the catalyst for learning and pursuing goals. In fact, it may be argued that learning simply cannot take place without an initial interest in the subject matter (Woolley & Fishbach, 2016). If interest is a prerequisite to effective learning, then finding better leadership candidates may be a matter of finding more interested and inquisitive candidates.

Recommendations for Further Research

Additional research seems needed on the temporal-spatial patterns of interest in leadership. As mentioned by Stephens-Davidowitz (2017), in regards to using big data, the "research discussed here is the tip of the tip of the iceberg, a scratch on the scratch of the surface" (p. 275). In this study's findings, certain times of the year and certain geographic regions were much more prone to express user interest in leadership through the proxy of Google searches than during other time periods and places. The area of temporal-spatial patterns of interest is one that warrants continued exploration. The relative cost is low, and the potential

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benefit is high. Google arguably offers one of the most impressive data sets on human behavior available. By utilizing online search data, researchers and practitioners make decisions based upon what people do and not just what they report in surveys. The Google data can help researchers to observe how people behave in real-world settings rather than depending on manufactured social experiments such as using a homogeneous cohort of undergraduate social science students.

Modern research efforts and organizations increasingly depend on big data. The commonly held narrative has been that companies often make most of their important decisions by simply relying on HIPPO—the highest-paid person's opinion (Rodriguez-Mazahua et al., 2015). However, the future of these companies can no longer be sustained on opinion alone. Facts are needed, the kind of facts that big data can supply. Regarding the topic of leadership, the researcher of this current study recommends the continued use of online search behavior to find potential leadership candidates and to study public perceptions of leadership. In particular, Google Correlate may be useful in finding the right leaders for the right jobs beyond the stereotypical criteria, such as pure charisma and physical characteristics, used in many leadership choices (Cohn & Moran, 2011). In addition, other online sources could also be utilized to explore the topic of leadership. For example, Wikipedia data could be coded to explore common traits of notable leaders. Also, Facebook data could be coded to further explore the public's general interest in leadership.

Regarding improvements to this current study, the methodology of Research Questions 2 and 4 could be slightly altered to help further explain any changes in leadership interest over time. For example, instead of downloading a single relative data set of the two time periods, two separate data sets could be downloaded for comparison. More work may be needed in

delineating certain variables as coded by Google. Depending on the media markets, certain cities and regions can be split in unexpected ways, and, therefore, these distinctions may warrant some control of variables in future research. Moreover, perhaps factors could be explored to help explain the variance found between seemingly similar areas. Also, as mentioned, additional tests could be run on the data sets to adjust for outliers such as Washington, DC.

Future researchers should investigate utilizing Google Trends and Google Correlate with other data sources. For example, state demographic percentages could be compared with search rates to find correlations that extend beyond the temporal and spatial facets. Future research could also be used in tandem with other studies to explore patterns such as utilizing Saiz and Simonsohn's (2008) city corruption measure to further investigate city leadership interest. One particular area of interest to this researcher would be comparing state religiosity to leadership interest.

In general, Google Trends is best optimized when utilized with other data sources. Research Question 7 showed how Google city data could be used in tandem with city conservatism scores. This correlation of data sets is just one example of nearly limitless possibilities. Researchers can look for relationships in various sorts of data sets in coordination with Google Trends. Variables such as gross domestic product (GDP), school attendance, and crime rates could all be utilized with Google data to find interesting trends of interest and behavior. For example, the variables of low GDP, low school attendance, and high crime rates could be analyzed to see if they correlate with a lower interest in leadership. Among these options, perhaps a regression discontinuity could be explored to compare a precise natural cutoff between two groups. Another possibility for further study is to look into options for more natural experiments. For example, researchers could compare two areas on opposite sides within the

same time zone (Gibson & Shrader, 2015), or measure the difference in an area before and after an economic boom (Kearney & Wilson, 2018).

Furthermore, a focus of future research should be on experimenting with Google search data in different ways. Google searches have often been used as an independent variable to predict the dependent variable (Stephens-Davidowitz, 2013b). However, researchers may also use Google searches as the dependent variable to help determine user motivation. Stephens-Davidowitz (2013b) discussed how Google data can be used to uncover drivers of voter turnout, and consequently, form better predictive turnout models. "Traditionally, political scientists have used self-reported voting likelihood as the dependent variable.…If Google searches are a better predictor of voting intention, they can potentially be used as a dependent variable to understand the predictors of turnout" (p. 15). For example, a successful convention may mobilize the voting base, which will be reflected in online search activity and ultimately in turnout rates. By measuring the relative volume of Google searches that include a keyword within close proximity to an event, telling patterns may emerge. Another way to use Google data differently would be to explore public perceptions of leadership. Researchers might determine whether people seek more positive or more negative information by examining how Google Search users investigate the topic of leadership.

Finally, another area for consideration in future research might involve mobile and smart devices. Today, a little over one in ten American adults are "smartphone-only" Internet users. The reliance on smartphones is especially true for younger adults, minorities, and lower-income Americans (Pew Research Center, 2018). Use of smartphone browsing is one of the next big ventures already taking place in online searching research.

Summary and Conclusion

The purpose of this study has been to investigate the relationship between online search behavior and interest in leadership. Primarily, this study established certain temporal-spatial patterns of interest in the topic of leadership as determined by relative Google search rates within the United States. The results of this study have offered descriptive, comparative, and correlational statistics for consideration, and, as such, the data was used to observe patterns and relationships between Google users and their leadership interest.

The null hypotheses for Research Questions 1, 3, 5, and 7 were all retained. The distribution of relative search rates from 2004 to 2017, when considering both time of year and the state, was considered normal. No significant difference was found when comparing high and low search volume cities, and no significant relationship was found between a city's conservatism and the city's leadership interest.

However, the null hypotheses for Research Questions 2, 4, and 6 were all rejected. Overall nationally, when comparing the two time sets of 2004 to 2006 and 2014 to 2016, the earlier time frame was favored. Similarly, when comparing the two time sets of 2004 to 2006 and 2014 to 2016 among the states, the earlier time frame was favored. A significant difference was also found when comparing leadership interest of Florida cities with Florida media markets, favoring the latter. These findings are exciting for leadership researchers and practitioners, as the results may help paint a generational and cultural picture of public leadership interest.

So, who is interested in leadership? Well, it seems that everyone has at least some stake in leadership. No time periods or geographic areas researched in this current study held a relative search rate of zero. Although interest appeared to be stronger during certain months and within certain states, an overall interest in leadership remained intact.

The topic of leadership is relevant to all fields of research and practice. Leadership is one of those collective constructs: "a universal phenomenon in humans" (Bass, 2008, p. 7). Whether in education, business, government, or church, leadership plays an important role. Societies and systems quite often have been defined through their leaders and the subsequent impact of leadership. Whole civilizations have been reduced in understanding to just a few key leaders (e.g., how ancient Greece equates to Alexander the Great or ancient Rome equates to Julius Caesar).

Thus, understanding and fostering an interest in leadership appears to be an important and meaningful endeavor. Search engine data, such as that from Google, may provide the insights not found in other research platforms that might greatly enhance the research process. Research based upon Google data holds great promise in providing information as to why people might be interested in the topic of leadership and what the public's perception of leadership might be on the broadest of possible research spectrums. The when and where of a person's search for leadership information may reveal interesting and useful characteristics of potential leaders. The methods and contextual details of a person's search may further reveal the general perceptions surrounding the concept of leadership. Whatever the case, leadership has been here as long as humanity, and it will surely continue. Leadership, as a topic of study, can now be researched in increasingly dynamic ways because of technology. As a social construct, leadership is not going away anytime soon. Likewise, technology such as Google is here to stay. With its eminence comes an untapped potential and ability to study human behavior, to evaluate mass social trends, and to explore innumerable possible applications within societal politics, organizational marketing, and university leadership programs.

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