

# Considering the Effects of Time on Leadership Development: A Local Government Training Evaluation

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## Abstract

As local governments across the United States adapt to economic shifts, workforce reshaping, and continued demand for services, training to confront these challenges has become more important. However, training resources are limited, investment in these programs is not always prioritized, and evaluating outcomes is difficult. This study analyzes data from a local government leadership development program to examine training impacts over time. It focuses on leadership skills and the ways in which individual's self-assessments change over time. The findings indicate that although leadership training is an important factor in the development of both conceptual and interpersonal leadership skills, the long-term effects of training on these two types of skills vary significantly. Understanding the training effect decay associated with leadership skills development can help human resource managers and public organizations strategically plan, evaluate, and invest in these training activities to better prepare their workforce to meet future challenges.

## Keywords

training and development, local government, leadership

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## Introduction

The local level is where street-level bureaucrats translate public priorities into practice (Lipsky, 2010). The discretion exercised by these local-level workers can have powerful implications for citizens (Maynard-Moody & Musheno, 2003), particularly given that these individuals are “embedded in interacting policy, organizational, professional, community, and socio-economic systems” (Meyers & Vorsanger, 2007, p. 154). While the need for leadership development is essential for municipal public servants, training budgets have not kept pace with demand (Ammons & Fleck, 2010; Police Executive Research Forum, 2010). And in this environment, understanding the value and impact of training for public service leaders is more important than ever (Moore, 2013).

As the public service workplace continues to confront a range of challenges, organizations must commit to strategic development of employees’ knowledge, skills, and abilities (Pynes, 2013). Particularly in an environment where reductions-in-force and hiring freezes have been commonplace, leadership development programs can be valuable tools to grow leaders from within an organization and address some of the negative impacts of these trends (Blunt, 2009). These development programs have the potential to enhance the technical, conceptual, and interpersonal competencies of employees (Pernick, 2001).

Perhaps of equal importance, the benefits of leadership development extend beyond the individual level. The development of public service leaders is integral to the effectiveness of government organizations (Ingraham & Getha-Taylor, 2004). Specifically, leadership development aids succession planning by sustaining intellectual capacity and knowledge capital for the future (Helton & Jackson, 2007) and enhances organizational performance (Ingraham, Sowa, & Moynihan, 2004). Leadership development is particularly meaningful amid governance structures in which local government leaders must navigate the complexities associated with organizing and managing public-sector regimes, private agencies (e.g., contractors), programs, and activities to achieve municipal objectives (Ingraham et al., 2004). By investing in programs that strengthen employee leadership, an organization enriches its future.

Despite the need for leadership development, organizations often enact budgetary cuts at the margins, yielding dramatic decreases—or elimination—of support for employee training (Blunt, 2009). As a result, evaluating the effectiveness of leadership development programs is essential because public managers must justify program funding by demonstrating the utility and return on investment of formal training (Klingner, Nalbandian, & Llorens, 2010). A careful evaluation plan designed before the start of a program can help identify the ways in which training produces learning and results (Kirkpatrick & Kirkpatrick, 2006). Yet, return on investment can be difficult to quantify (Phillips & Phillips, 2001).

Despite the noted importance of training evaluation, literature on this topic is sparse compared with other areas of leadership scholarship (Conant, 1996; Fiedler, 1996; Solansky, 2012). The few studies of training effectiveness and return on investment in the public sector tend to focus on the federal or state levels—investigations at the local

level, the context of this study, are less frequent, though no less important (Phillips & Phillips, 2002). This study seeks to fill that gap by assessing the outcomes of a local government leadership training program, with a particular emphasis on how these outcomes potentially change with the passage of time. In doing so, it contributes to the literature by underscoring the impact of leadership development training evaluation at the individual level.

Furthermore, it highlights the broader effects of training evaluation at the organizational level. For instance, assessment of training programs better enables organizations to systematically identify (or re-identify) training needs and, perhaps more importantly, identify *how* the features of training position personnel to fulfill organizational objectives (Vukovic, Završnik, Rodic, & Miglic, 2008)—the latter of which is particularly meaningful at the local level, given its proximity to the citizenry. Simply put, the return on investment and impact associated with training program evaluation is present at both the individual and organizational levels (Brinkerhoff, 1988) and may better equip local governments to achieve their missions, goals, and visions.

In the remainder of this article, we first review literature on leadership development training and evaluation. Next, we present the research questions, study design, and analytic approach. Finally, the “Discussion and Conclusion” section presents study contributions, limitations, and steps moving forward.

## Learning From the Literature: Leadership Development

Leadership development is defined as “expanding the collective capacity of organizational members to engage effectively in leadership roles and processes” across a range of conditions (Day, 2000, p. 582; see also Hooijberg, Bullis, & Hunt, 1999; McCauley, Moxley, & Velsor, 1998). Specifically, leadership development aims to help people understand—through social and relational learning processes—how to build relationships, work effectively with others in the organization, access resources, coordinate activities, and build social networks (Iles & Preece, 2006; Pernick, 2001; Wenger, 1998). Formal training is a means to develop individual leadership skills (Pynes, 2013; Rohs, 1999; Solansky, 2010). The primary focus of these programs is the acquisition and development of leadership skills, which are classically organized in a three-factor taxonomy: technical, conceptual, and interpersonal (Katz, 1974; Yukl, 2010).

Technical skills are those related to the skills, knowledge, and proficiency to perform the tasks required of the job and those necessary to competently oversee the work of others (Pernick, 2001). These skills are related to completing a given task and producing the goods or services that the organization provides. While the development of technical skills is important, its inclusion in leadership training curricula is more likely when those being trained perform similar tasks as opposed to when participants come from a variety of functional areas. For example, tactical maneuvers are generally an integral component of leadership development programs for police officers. Conversely, a leadership program that serves an entire municipal workforce is unlikely to include this type of exercise. Most leadership training programs, including the program studied in this article, focus specifically on the development of conceptual and

interpersonal skills. Thus, this article utilizes Katz's (1974) framework, which emphasizes the value of conceptual and interpersonal skills in developing leaders while not undervaluing the importance of technical proficiency. Conceptual skills are those related to ideas and concepts and are "central to creating a vision and strategic plan for an organization" (Northouse, 2013, p. 46). They are characterized by the ability to "see the organization as a whole" and in a systemic manner (Peterson & Van Fleet, 2004, p. 1300). Interpersonal skills are those that are related to effectively cooperating and communicating with others (Pernick, 2001; Peterson & Van Fleet 2004).

While leadership development benefits the entire organization, it commences at the individual level through focused training activities. This is evident in the public sector where government agencies create multiple avenues through which employees can gain leadership skills (Van Wart, 2008). Strengthening leadership in public agencies requires ongoing investments in initiatives that develop the knowledge, skills, and abilities of employees and that foster their commitment to civic responsibility (Cress, Astin, Zimmerman-Oster, & Burkhardt, 2001; Kouzes & Posner, 2003). Skills and the characteristics needed in public service leaders are perhaps best "grown" within the organization itself (Blunt, 2009).

Formal training develops leadership competencies with the recognition that participants come into the program with "diverse skills, learning styles, and experiences" (Solansky, 2010, p. 675). Moreover, leadership development converts employee capabilities into abilities (Barker, 1997), causing employees' individual dispositions to contribute to the collective value of the organization (Shafritz, Russell, & Borick, 2011). However, just as well-designed training programs can benefit employees, poor training—and the failure to detect such—limits employee development and may be harmful to the organization (Van Wart & Dicke, 2008). Thus, evaluation is critical for identifying training benefits and flaws.

However, most evaluation programs focus only on immediate participant feedback, neglecting the longer-term impacts on learning, behavior, or results (Kirkpatrick & Kirkpatrick, 2006). In addition, limited resources direct the organizational attention toward training with less investment in evaluating its long-term effects (Ammons & Fleck, 2010). By contrast, this study provides an opportunity to examine impacts over time. Of particular interest is how long the training effect lasts or decays with the passage of time.

According to Arthur, Bennett, Stanush, and McNelly (1998), skill decay "refers to the loss or decay of trained or acquired skills (or knowledge) after periods of nonuse" (p. 58). Scholars have examined the ways in which different types of knowledge decay at different rates (Berry & Dienes, 1993; Reber, 1989; Tunney, 2003) and have also considered how the degree of initial learning influences decay (Loftus, 1985). A key question in the psychology literature is the relationship between decay and forgetting. According to Wixted (2004), lack of reinforcement, rather than forgetting, can serve as an explanation for decay. This can have implications for the transferability of training to the workplace (Baldwin & Ford, 1988).

When applied to training contexts, the concept of decay is "particularly salient and problematic in situations where individuals receive initial training on knowledge and

skills that they may not be required to use or exercise for extended periods of time” (Arthur et al., 1998, p. 58). Only through pre- and post-training evaluations is it possible to examine maintenance over time (Baldwin & Ford, 1988). A meta-analysis of the skill retention literature found that factors influencing decay include length of retention interval, degree of overlearning, certain task characteristics, methods of testing for learning and retention, conditions of retrieval, instructional strategies or training methods, and individual differences (Arthur et al., 1998). Furthermore, the authors’ meta-analysis revealed that different kinds of skills decay at different rates.

This investigation draws on decay theory to consider lasting impact in the context of training evaluation (Anderson, 2000). This is an important question to determine the proper interval for investing in training programs, but one that is rarely addressed empirically in scholarly literature.

## **Purpose, Context, and Research Questions**

This study examines individual leadership development using self-reported measures before and after participation in a formal, 3-day supervisory leadership training program offered for public managers in a single Midwestern city during 2010-2011. Table 1 presents a description of participants. The city’s managers (a total of 167 individuals at the start of program) were all enrolled in the supervisory leadership training program. Eight training sessions were scheduled over the course of 9 months to average approximately 20 participants at each training session.

Assignments to the sessions were not randomized: Program coordinators managed enrollment to ensure a diverse group at each session representing various city departments and accommodating various departmental schedules. Certainly, this lack of randomization introduces a potentially troublesome source of bias in the search for training impacts if participants were assigned or self-selected into particular training sessions based on observed or unobserved characteristics that are related to leadership capabilities. However, we present evidence that suggests that any differences in the assignment to training session are not systematically related to training outcomes.

Furthermore, the curriculum, content, and delivery of the training itself were standardized across training sessions, and the instructor who facilitated all sessions had ample experience offering the training program in different locales prior to the session from which our data are drawn. The program has been offered in a similar format for the previous 6 years and an estimated 1,000 participants have completed the program prior to this iteration. Thus, we can be reasonably confident that the results we present are not driven by differences in the composition or the effectiveness of content delivery of the training program between the individual sessions.

The program focuses on the theme of “supervisor as leader” and emphasizes skill development related to managing the relationship with employees. To this end, the program offers a curriculum of diverse supervisory topics that span individual leadership development (including leadership styles), traditional organizational challenges (such as conflict management, coaching, and performance appraisal), as well as emerging leadership priorities (including collaboration). Table 2 provides the full

**Table 1.** Sample Description.

Gender	
Female	21.9%
Male	65.6%
Prefer not to answer	12.5%
Organizational tenure	
Range = 0-36 years	Average = 16 years
Department/unit	
Public works	35.5%
Police	21.5%
Fire	11.8%
Parks and recreation	10.8%
Other (Legal, Municipal court, Information technology, Resource management, Communication, City managers' office)	20.6%
Highest level of education	
High school	5.3%
Some college or technical training	42.6%
4-year college degree	31.9%
Some post-graduate work	8.5%
Graduate degree	11.7%
Age	
<30	0%
30-39	10.4%
40-49	40.6%
50-59	32.3%
60+	5.2%
Prefer not to answer	11.5%
Number of employees supervised	
1-5	33%
6-15	36.2%
16-30	9.6%
31-49	10.6%
50-99	4.3%
100+	5.3%
Number of other leadership training programs completed	
0	5.1%
1-3	46.9%
4-6	28.6%
7-9	7.1%
10+	12.2%

schedule, including descriptions of daily topics. Content is delivered via a variety of instructional tools and techniques, including lecture, multimedia presentations, self-assessments, group discussions, scenarios, and follow-up peer consultations.

**Table 2.** Leadership Training Topics and Schedule.

	Description
<b>Day 1</b>	
Introduction	About the training, introductions, expectations
Vision, values, and mission	Aligning training with city-specific goals
Leadership	The role of supervisors, leadership development in the public sector, leadership skills, and assessment
Leadership styles	Strengths inventory, identifying strengths and overdone strengths, recognizing individual conflict sequence
<b>Day 2</b>	
Interpersonal leadership skills	Supervision and personality, managing up, communication, motivation, and engagement
Teambuilding and collaboration	Stages of team development, managing change, collaboration and the transformation of governance, leading diverse teams, delegation
Managing work	Performance management and coaching, annual performance reviews, documentation, and disciplinary action
<b>Day 3</b>	
The work environment	Creating an optimal work culture, workplace scenarios
Legal issues for supervisors	Risk management and liability, employment law
Implementation and evaluation	Leadership “apps” and peer consultations
Conclusion	Learning review

Drawing from participant surveys and self-assessments, this research examines two connected research questions:

**Research Question 1:** Is there evidence that the leadership training affects self-perceptions of leadership ability?

**Research Question 2:** Does the passage of time affect these self-perceptions?

These questions are aligned with Kirkpatrick and Kirkpatrick’s (2006) training evaluation framework, which includes examination of four levels: reaction, learning, behavior, and results. While the authors indicate that immediate reaction-level evaluation is important but insufficient to determine impact, it is worth noting that, “if training is going to be effective, it is important that trainees react favorably to it” (p. 27). Participants’ reaction to this local government training initiative was assessed in two ways. First, the instructor polled participants immediately following the conclusion of each 3-day session. The program instructor shared the aggregate results for the purposes of this research and the results indicate strong immediate satisfaction with the program (see Table 3).

**Table 3.** Course Effectiveness: Reaction Data.

Questions	Mean response (n = 168)
1. The instructor made the subject matter seem worth learning.	4.7
2. The instructor's classroom style enhanced learning.	4.7
3. The instructor encourages the class to evaluate problems and ideas critically.	4.7
4. The instructor was open to viewpoints different from his or her own.	4.8
5. The classroom discussion was engaging.	4.6
6. The materials or handouts were helpful.	4.3
7. The course subject matter was relevant and useful.	4.6
8. Overall, the course helped me improve my management and/or work skills.	4.5
9. Sufficient time was allotted for each subject covered.	4.3
10. I would recommend this course to others.	4.6

Note. Likert-type scale responses: 1 = *strongly disagree*; 2 = *disagree*; 3 = *neither disagree nor agree*; 4 = *agree*; 5 = *strongly agree*.

Second, a post-training survey included questions on satisfaction with the training. The majority of participants (77.7%) indicated that their expectations for participating in the program were met to a moderate, great, or very great extent. Furthermore, most participants (74.3%) described the training program as moderately, very, or extremely effective. Similarly, most who completed the program (73.3%) would be moderately, very, or extremely likely to recommend the training program. Finally, 77% of participants indicated that the program had a positive impact on their leadership effectiveness.

This investigation offers insights beyond these reactions. To assess additional levels of effectiveness, including learning, behavior, and results, Kirkpatrick and Kirkpatrick (2006) recommend assessing before and after the program and allowing time for change to take place. Factual knowledge may be appropriate for objective tests to determine changes in learning; however, attitude change, personal development, and behavioral change are typically assessed through surveys, interviews, or other perceptual measures that center on trainee feedback (sometimes in conjunction with perceptual measures from subordinates and/or supervisors, as appropriate and practical). This study provides an opportunity to examine changes over time.

## Data and Method

The data we use were drawn from surveys completed by training participants. All participants in the training program were invited to complete three online surveys regarding the training program. These surveys were conducted at 3 times: November 2010, March 2011, and August 2011. Surveys were timed strategically: The first survey was conducted before any participants included in this study had received training



**Table 4.** Leadership Training and Survey Timing.

Date	Leadership group trained	Administration of survey
November 15		Pre-training survey
November 30-December 2	Group 1	
January 4-6	Group 2	
February 15-17	Group 3	
March 1-3	Group 4	
March 15		Mid-point survey
April 5-7	Group 5	
May 3-5	Group 6	
June 28-30	Group 7	
August 17		Post-training survey

and the last survey was conducted after all study participants had completed the training. An additional survey was offered at the chronological midpoint. While a true “switching replications” design would survey all participants before and after each of the seven training sessions to isolate the training effect, this modified approach reduces response fatigue by surveying all participants a total of 3 times (see Table 4 for timing). Critically, the delivery of these surveys implies heterogeneity across participants in the time between completion of training and completion of the survey instruments themselves. We take advantage of these unique features in seeking answers to our two research questions.

For the current analysis, we focus on 17 individual items included in the survey that asked respondents to assess their current level of effectiveness with respect to various aspects of their own leadership abilities. Each individual item utilizes a 5-point Likert-type scale, ranging from “Ineffective: Needs much improvement” (the lowest possible score) to “Effective: Needs no improvement” (the highest possible score). Pooling all usable survey responses from the three survey waves, we use these 17 items in principal component factor analysis, retaining extracted factors with eigenvalues equal to or exceeding 1. Following extraction, we subject the factors to orthogonal varimax rotation, thereby eliminating correlation between factors. A two-factor solution emerges that comports with Katz’s (1974) conceptual and interpersonal skills categories. Items that involved assessing and managing employees, providing direction, and connecting individual effort to organizational outcomes loaded onto Factor 1 (Conceptual leadership), whereas those skills that dealt with communication, working with others, and interpersonal feedback loaded onto Factor 2 (Interpersonal leadership). Table 5 presents the loadings for the extracted and rotated factors for items with a primary factor loading of greater than or equal to 0.4. For purposes of clarity, we suppress the reporting of secondary loadings.

The two unique factors contain 53.3% of the common underlying variation of the full set of survey items. In general, the two factors identified comport well with the theoretical classifications of leadership skills, namely, conceptual and interpersonal

**Table 5.** Principal Component Factor Analysis of Leadership Survey Items.

Survey item	Factor 1 (conceptual leadership)	Factor 2 (interpersonal leadership)
Assessing employee development needs	0.743	
Selecting appropriate individual leadership style	0.593	
Providing direction	0.635	
Managing employee performance	0.665	
Communication		0.595
Ability to work well with others in organization		0.779
Collaborating with those outside the organization		0.645
Understanding citizen needs		0.619
Creating clear goals	0.777	
Providing appropriate feedback		0.541
Recognizing achievements		0.446
Connecting individual effort and organizational outcomes	0.698	
Holding others accountable	0.534	
Working through adversity		0.490
Managing conflict	0.559	
Strategic planning	0.717	
Ability to accept feedback		0.710

skills. Conceptual skills provide individuals with the capacity and skills to think in a more abstract and critical nature, thus improving strategic thinking and decision making (Pernick, 2001). Such skills take a wide variety of forms within organizational life. Strategic planning, creating clear goals, and providing direction comport with this category of leadership skill. Connecting an individual's effort to organizational outcomes can also be categorized as a conceptual skill as it connects an employee's actions to the organizational mission, goals, and vision. To accomplish this, leaders must also skillfully assess employee development needs. "Needs" here consists of both what the employee "needs" to develop individually but also includes the knowledge, skills, and abilities that the organization "needs" to develop for it to successfully operate. Relatedly, the conceptual skills of the leader often must be used to manage employee performance to attain the organization's goal. This requires that the leadership select the optimal leadership style to effectively manage their work unit and hold individuals accountable for their performance. Similarly, as conceptual skills also include the ability to creatively solve problems (Yukl, 2010) and to "act in a way which advances the over-all welfare of the total organization" (Katz, 1974, p. 36), managing conflict and working through adversity are included in this classification as well.

Skills such as the ability to work with people, including the ability to communicate effectively, to work in groups, and to understand the feelings, attitudes, and motives of others from what they say and do (Katz, 1974) are considered interpersonal skills. Understanding these individual feelings and motives is particularly important when providing appropriate feedback. This understanding is also critical as leaders accept feedback from those above and below him or her in the organizational hierarchy as it allows the leader to better interpret the motives behind the feedback being given. Related to the idea of feedback, leaders can utilize intrinsic motivators such as recognizing and celebrating achievements. Finally, as much of the public sector revolves around the co-production of services, interpersonal skills in the public sector not only involve the ability to work with those within the public organizations, but also includes the ability to work with the public and collaborative partners. Leaders must utilize interpersonal skills to understand the needs and desires of their organization's constituency.

Using the two extracted factors, we generate factor scores for each survey response observed in the data set using the regression method. This method generates a predicted score for both of the two factors for each observation utilizing the factor loading matrix and using the observed values of each response item as predictors. The generated factor scores are standardized to a mean of zero and a standard deviation of one, implying that the sign and relative size of the scores convey the direction and magnitude of the differences between a particular survey's responses as compared with the average overall response across all completed surveys. The two generated factor scores—corresponding with the two extracted factors—comprise the dependent variable in the analyses that follow.

In answering the first research question—whether the leadership training was observed to affect participants' self-perceptions of the two dimensions of leadership skills—we provide *t* tests comparing the estimated scores for both factors from all survey respondents on the November 2010 survey (which all participants completed prior to receiving the leadership training) to the factor scores for all survey respondents from the August 2011 survey (which all participants completed after receiving the leadership training). In this test, participants serve as their own control group. This approach represents the standard approach to evaluating the impacts of treatments of various kinds, including training programs.

Answering the second research question—whether the passage of time is observed to affect the training's impact—requires a different approach. To answer this question, we calculate the difference between a respondent's factor scores on the post-treatment survey and that same respondent's factor scores on the pre-treatment survey, thereby capturing not the level of self-perceived effectiveness, but the difference in those self-perceptions before and after completion of the training program. We utilize this measure as the dependent variable in a regression, and attempt to predict it utilizing the respondent's self-reported characteristics and the passage of time since completion of training as independent variables. The inclusion of the "passage of time" variable—measured as the number of days that have passed since participation in the training program—is made possible by the nature of the post-treatment survey, which was

conducted at a single point in time after the completion of all training programs rather than administered to participants immediately following participation. This feature affords us some resolution on the important question of whether treatment effects are enhanced, decayed, or unchanged by the passage of time, and thereby provides some nuance to the findings generated utilizing the simple *t*-test approach.

However, a drawback of the data used in this study is the fact that, while all program participants were invited to complete all waves of the survey, unique identifiers were not provided by all participants across all waves of the survey. In instances where a unique identifier was not provided or provided inconsistently, self-reported respondent characteristics, such as age, race, gender, education, tenure and department of employment, and number of employees supervised, were used to match individual respondents' responses across survey waves. Utilizing these characteristics, we estimate Gower's (1971) general dissimilarity coefficients for each unique pair of pre- and post-treatment survey responses. Gower's dissimilarity coefficient is a measure that is commonly used in data mining practices to compare two cases utilizing data of mixed types (ordinal, nominal, categorical, or continuous). Like a correlation coefficient, it is bounded by zero and one, with a zero indicating that the two cases compared are exactly identical and a one indicating perfect dissimilarity. We use these coefficients to artificially construct a two-period panel of data from our pre- and post-treatment surveys.

Of course, the choice of a cutoff point for the dissimilarity coefficient—the point at which two observations are deemed sufficiently dissimilar such that they should not be treated as a pair—is one that must be made with some degree of subjectivity. This choice also represents a direct trade-off between statistical power (as restricting the number of pairs necessarily implies smaller sample sizes and larger estimated standard errors), and the potential for reaching incorrect inferences that is driven by inappropriately treating a pair of pre- and post-treatment surveys as though they were produced by the same individual when they were, in fact, generated by two different respondents. After a number of rounds of calibration (in which potential matching sets were generated utilizing various cutoff points and analyzed independently by each of the authors), we decided on a particularly conservative approach: Only pairs with a Gower's coefficient of .025 or smaller were kept, meaning that all pairs included in the regression analysis possess estimated similarities of at least 97.5%. Eliminating incomplete responses yielded 99 usable pre-treatment surveys and 80 usable post-treatment surveys that were utilized in the procedure discussed above, resulting in 39 matches meeting the specified criteria. For these 39 pairs, differences in post- and pre-treatment factor scores were calculated. We use this measure as the dependent variable in our regression analysis.

## Results

Table 6 presents the results of the *t* tests conducted on the difference in pre-training and post-training factor scores for each of the two leadership skills. The results of these tests indicate that there is a significant increase in self-reported effectiveness in

**Table 6.** t-Test of Leadership Factor Scores From Pre- and Post-Training Surveys.

	Pre-training		Post-training		Difference	t
	M	n	M	n		
Conceptual leadership	-0.279 (1.084)	108	0.222 (0.859)	97	0.501	3.641***
Interpersonal leadership	-0.122 (1.016)	108	0.265 (0.880)	97	0.387	2.902***

Note. Standard deviations in parentheses.

\*p < .10. \*\*p < .05. \*\*\*p < .01.

both leadership skill categories between when the participants were initially surveyed prior to participating in the training and when they were surveyed after their involvement in the training program, supporting the notion that leadership training can be effective.

The second key question that resulted from the initial analysis regards the effect of time on self-reported leadership effectiveness. There is a wide array of approaches to optimal frequency of leadership training. These approaches range from annual training to once-per-career training and everything in between. To try to determine the decay of the training effect, we estimated two ordinary least squares (OLS) regressions (one per each of the two leadership skills), each of which was specified as

$$\Delta I = \beta_0 + \beta_1 d + \beta_2 \mathbf{X} + u, \tag{1}$$

where  $\Delta I$  captures the difference between the post- and pre-treatment factor scores for each of the two leadership skills;  $d$  captures the number of days between completion of the leadership training and the completion of the post-treatment survey;  $\mathbf{X}$  represents a vector of control variables including the respondent’s gender, age, education level, and years of work experience;  $u$  represents the idiosyncratic error term; and the  $\beta$ s are parameters to be estimated. Days since training completion and years of work experience are coded as continuous variables, whereas gender, age, and education are specified as sets of categorical variables with the modal value serving as the omitted (reference) category. Table 7 presents the results of these regressions, which we estimate using the 39 matched observations generated as previously described. To control for potential heteroskedasticity, Huber–White standard errors were used in both regressions.

The results of the regression analysis show that the only significant predictor of self-assessed conceptual leadership effectiveness is the decay effect variable. The longer the duration since completing training, the lower the level of self-assessed conceptual leadership. For each day since training, an individual’s self-assessed conceptual leadership effectiveness is expected to decrease by 0.006 standard deviations. In essence, this means that an individual’s self-assessed conceptual leadership effectiveness is expected to decrease by 1 standard deviation every 166 days and 2.19 standard deviations over the course of a year, suggesting that regular conceptual leadership training may be needed to maintain effectiveness in this area. Conversely, no statistically significant relationships were identified in the interpersonal leadership model,

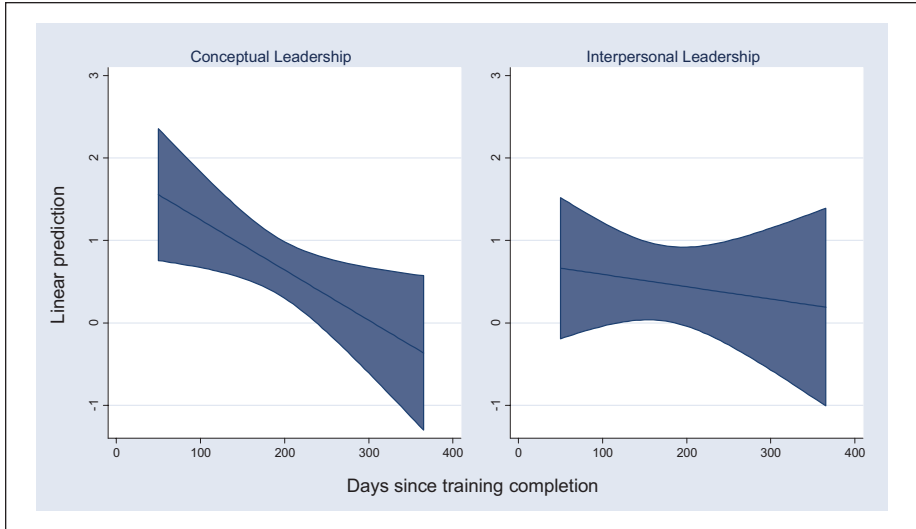
**Table 7.** OLS Regression Results.

	Conceptual leadership	Interpersonal leadership
Days since completing training	-0.006** (0.003)	-0.002 (0.003)
Male (reference category)		
Female	-0.428 (0.609)	0.139 (0.951)
Gender not disclosed	0.434 (0.376)	-0.941 (0.726)
Age 30-39	0.979 (0.644)	-1.136 (0.963)
Age 40-49 (reference category)		
Age 50-59	0.459 (0.563)	-0.084 (0.585)
Age 60 or older	0.662 (0.790)	-0.873 (1.152)
Age not disclosed	-0.405 (0.936)	-0.279 (1.056)
High school graduate	0.221 (0.609)	0.661 (0.781)
Some college or technical training (reference category)		
Four-year degree	0.282 (0.551)	-0.444 (0.677)
Some graduate work	0.549 (0.655)	-0.839 (0.808)
Graduate degree	0.475 (0.783)	0.802 (1.751)
Years of work experience	-0.011 (0.034)	-0.008 (0.044)
Constant	1.572 (1.081)	1.284 (1.274)
Observations	39	39
R <sup>2</sup>	.320	.164

Note. Robust standard errors in parentheses.

\* $p < .10$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

indicating that neither the decay variable nor any of the control variables significantly affected views on this leadership category. Thus, frequent training in interpersonal leadership may not be warranted, as an initial training has a comparatively longer effect. To further illustrate the differences in the decay of the skill development associated with



**Figure 1.** Decay in pre–post differences in leadership skills.

Note. The shaded area represents the 95% confidence interval around the estimated effect.

the leadership training, we calculate and visually display predictive margins for each of the two leadership skill categories plotted over time. These plots are provided in Figure 1.

The two plots tell very different stories. The confidence intervals generally include zero for all of the predictive margins of interpersonal skill scores. This indicates that there is no degradation of self-reported interpersonal leadership skills for the time period included in this study. However, there is a clear decay in conceptual skill effectiveness, as evidenced by the negative slope of the line. From the day of training until about Month 8, the effect of training is decreasing but still greater than zero, meaning that the training significantly increased the perception of conceptual skill effectiveness during this initial period. However, at about the 8th month mark, the training effect has decayed to the point that the effect has essentially worn off.

### Limitations

One limitation of this research is the reliance on individual self-assessments of leadership skills. A potential criticism of this approach centers on the issue of bias, particularly self-enhancement bias, which could cause an inflation of reported evaluations. Certainly, we do not (and perhaps cannot) know with certainty that the self-assessments on which we rely to create our dependent variable are unaffected by this and other types of perception biases, which are, in some sense, inherent to any subjective evaluations of self or others. Critically, however, we contend that the presence of these biases alone do not present a viable alternative explanation to our interpretation of our

empirical findings. The logic for this contention is straightforward. Such an alternative explanation would depend not on simply arguing that such biases exist (a claim that is consistent with a rich literature in public administration and other disciplines). Rather, it would require a more nuanced story of how such biases systematically account for the varied rate of decay in self-assessed leadership skills observed across the two dimensions of leadership that we study. In other words, we fully acknowledge that the *levels* of measures of self-assessed skills and abilities may indeed be biased; however, no empirical or theoretical literature of which we are aware suggests a similar relationship exists with respect to the *changes* in self-assessments over time. However, given the unique nature of our findings, we believe it to be a fruitful avenue of future research for scholars to utilize other instruments of assessment, including perhaps peer or 360° evaluations, to subject our findings to further empirical evaluation.

Also, given that benefits of training are evident after participants have applied learned skills in the context of work itself (Day, 2000), scholars should also consider distributing a follow-up survey long after the intervention has ended (Faerman & Ban, 1993; Rosch & Schwartz, 2009). While a follow-up survey is not planned at the time of this writing, it is certainly an option to consider for the future. Van Wart, Cayer, and Cook (1993) indicate that retention is affected by frequency of practice and feedback; a longer-term evaluation could potentially evaluate these factors in conjunction with self-assessments.

In addition, while there may be a concern associated with researcher involvement and associated impact on survey results (a potential Hawthorne effect), it is important to note that distance was maintained between the research team and program participants. The principal investigator was named on the web-based survey instrument and was introduced to participants but was not involved in delivering training or observing participants in the program. Finally, while this study presents findings from an investigation in a single municipality, our goal is to pave the way for additional studies at the local level to determine the broader generalizability of these findings.

## Discussion and Conclusion

What does this study tell us about the impact of leadership training on self-reported conceptual and interpersonal skill effectiveness? First, it shows that leadership training is an important factor in the development of and effectiveness in both conceptual and interpersonal leadership. In terms of interpersonal leadership skill development, the effects of training are positive and persistent, as no training effect decay was noticed during the course of this study. However, as the recency of training diminishes, the impact of the training program on conceptual leadership skills also diminishes to the point that after 8 months post-training, the effects of the training have disappeared. From a practical standpoint, the previous discussion provides evidence that leadership training in general is effective in increasing leadership skills. However, for conceptual skills, frequent leadership refresher courses may be warranted to maintain the leadership skills improvements that resulted from the initial training.



Naturally, the specific and unique characteristics of the particular leadership training program we analyzed as well as our limited sample (both in terms of size and generalizability to other settings and contexts) raise important questions about the usefulness of our results in informing practice. We do not intend our results to be narrowly interpreted, suggesting that all governments should offer conceptual leadership training annually (or more frequently than annually), whereas interpersonal skill training should occur less frequently. Benefit–cost analysis would be required to justify such a conclusion, and we possess no relevant data to inform such an exercise. Rather, we more generally suggest that greater attention from both academics and practitioners is needed to develop a more holistic understanding not only regarding the different dimensions of leadership and leadership skills (an area that already receives some attention in the literature) but also on the effectiveness of how such skills are nurtured, taught, and developed over time through mid-career training. Here, we present evidence that there may be critical differences in skill decay across the various dimensions of leadership that imply that a “one-size-fits-all” approach to the development of leadership skills may not be serving public interests particularly effectively. As governments everywhere continue to struggle with justifying allocation of scarce budgetary resources between employee training and other demands, a better understanding of the complex dynamics of how leaders can be trained and developed over time is required to ensure that these resources are providing maximum return on the public’s investment.

In addition to these findings, the post-test survey included questions to assess the perceived impact of the training on indicators of interest. Overall, participants noted the greatest impacts on teamwork (77.6% say it is somewhat better or much better as a result of the leadership development program), followed by collaboration (71.3%), communication (71.2%), and overall city leadership (70.6%). Furthermore, two open-ended questions allowed participants to identify changes they implemented following participation in the training program as well as the results of the changes. A variety of responses illustrate the ways in which participants applied conceptual and interpersonal skills.

The opportunity for the trainees to apply what they have been taught and to see how using those new and/or upgraded skills has improved their effectiveness as a leader allows their learning to be “useful” (Fink, 2003, p. 31). Thus, the impact of the training was also assessed through an analysis of the answers participants gave to questions about the changes that they have implemented as participating in the training and the results that those changes have had in their workplace. In terms of applying conceptual leadership skills, many participants reported that they felt that utilizing the conceptual leadership skills they learned improved their own and their unit’s effectiveness. For example, providing clear goals and defining expectations resulted in fewer questions regarding “what we are trying to achieve” and even “compliment[s] regarding [his] evaluation process” (Participant 38). Improvements in the employee assessment process were echoed by Participant 5, who commented that he or she had noted an improved ability related to “identifying weaknesses in employee performance and developing strategies to improve” (Participant 5). The ability to assess employees and

provide them with direction was also seen to have organizational-level outcomes, as “more immediate coaching” was found by one participant to result in improved performance (Participant 97), and another reported that assigning “work groups according to who could work best” led to “employees [being] more efficient in their work groups” (Participant 29).

Impacts were also seen in terms of interpersonal skills training. Improved communication was seen to have made a big difference within the participants’ units. Better communication allowed leaders to have “more interaction” with their employees (Participant 63) and helped employees have a “better understanding of processes” (Participant 34). Relatedly, “listening more [and making] more time for staff” helped “employees understand the city’s vision” and “[seemingly be] more attentive” (Participant 33). The benefits of interpersonal leadership skills training also extended across organizational boundaries as the training helped in the establishment of better communications and collaboration with other units (Participant 66).

Furthermore, Participant 68 reported that he or she had made a “concentrated effort to recognize quality work” and thought that this effort resulted in “employees know[ing] their efforts are not going unnoticed.” The influence of recognizing achievements was also cited by Participant 97, who reported that “praise for good work” resulted in “quality performance” and Participant 28, who wrote that the institution of a “recognition program for our group . . . has motivated employees to perform and be leaders.” Finally, the interpersonal skills training dealt not only with providing feedback to and recognition of employees but also with developing the ability of the leader to accept feedback. Participant 99 commented that since the training, he or she has “become a better listener” and has sought “feedback from those I supervise.” The result of those changes has been improved results, improved teamwork, and the realization by employees that they are important to the organization (Participant 99).

Together, these findings speak to major themes in leadership scholarship and practice. For instance, this research connects to the enduring debate about whether leaders are born or made (Van Wart, 2003, 2013). This study shows support for the latter by illustrating skills development waxing and waning. While there are limitations to what training can influence (Kempster, 2009), this research recommends strategic investment in training at specific points in time to help develop key leadership skills and that the timing and frequency of these interventions should differ depending on the nature of the leadership skill itself. These investments can be made in ways that contribute to broader organizational goals, such as learning transfer and succession planning. Assessing training over time can help human resource managers and public organizations make a better case for the return on investment argument and better prepare the workforce to meet the challenges of the future.

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