




“I’m Not Mopping the Floors, I’m Putting a Man on the Moon”: How NASA Leaders Enhanced the Meaningfulness of Work by Changing the Meaning of Work

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Abstract

It is assumed that leaders can boost the motivation of employees by communicating the organization’s ultimate aspirations, yet evidence on the effectiveness of this tactic is equivocal. On some occasions, it causes employees to view their work as more meaningful. At other times, it causes them to become dispirited. These inconsistent findings may in part be explained by a paradox: the very features that make ultimate aspirations meaningful—their breadth and timelessness—undermine the ability of employees to see how their daily responsibilities are associated with them. To understand how leaders can help employees resolve this paradox, I analyzed archival evidence to explore the actions of President John F. Kennedy when leading NASA in the 1960s. I found that Kennedy enacted four sensegiving steps, each of which helped employees see a stronger connection between their work and NASA’s ultimate aspirations. When this connection was strongest, employees construed their day-to-day work not as short-term tasks (“I’m building electrical circuits”) but as the pursuit of NASA’s long-term objective (“I’m putting a man on the moon”) and the aspiration this objective symbolized (“I’m advancing science”). My findings redirect research by conceptualizing leaders as architects who motivate employees most effectively when they provide a structural blueprint that maps the connections between employees’ everyday work and the organization’s ultimate aspirations.

Keywords: cognition, leadership, motivation, construal level theory, job satisfaction, interpersonal influence, job performance, work meaningfulness, meaning

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The quest for meaningful work is a central and defining feature of organizational life (Bunderson and Thompson, 2009). For decades, employees have reported that the meaningfulness of work—the perception that daily responsibilities have broader significance (Rosso, Dekas, and Wrzesniewski, 2010)—is more important than any other occupational feature, including income, job security, and the opportunity for career advancement (Cascio, 2003). When day-to-day activities are marked by a deep sense of significance, individuals are poised not only to thrive but to weather the most daunting elements of employment, including challenging tasks (Locke and Latham, 1990), low wages (Bunderson and Thompson, 2009), and stigmatized work (Ashforth and Kreiner, 1999). Likewise, the absence of meaningfulness has powerful ramifications, as one of the primary reasons employees disengage from their work is because it lacks significance (Kahn, 1990).

Given that meaningfulness is central to key work outcomes, an important responsibility of organizational leaders is to establish the conditions that enhance it. One widely held assumption is that leaders can boost the meaningfulness of work by articulating the organization's ultimate aspirations, which are the broadest and most far-reaching goals an organization seeks to attain (Gioia and Chittipeddi, 1991; Shamir, House, and Arthur, 1993). In recent years leaders have substantially increased the frequency with which they talk about their organizations' ultimate aspirations in pursuits as wide-ranging as tourism, tax auditing, and handbag manufacturing (Feintzeig, 2015). Consider, for example, one retailer's ultimate aspiration "to be the world's most customer-centric company" or a medical center's aim "to improve the world's health."

Yet evidence on the effectiveness of using the organization's ultimate aspirations to impart meaningfulness to work is mixed. Some leaders who convey the organization's ultimate aspirations motivate employees by infusing work with a greater sense of significance (Sparks and Schenk, 2001; Whittington, Goodwin, and Murray, 2004; Nemanich and Keller, 2007). Even employees engaged in tasks sometimes perceived as rote, such as those prevalent in manufacturing, accounting, and retail, have claimed that awareness of their organizations' ultimate aspirations increases meaningfulness (Dik, Byrne, and Steger, 2013). In contrast, however, a separate body of research has shown instances in which leaders' efforts did not yield the motivational effects they intended (Langelier, 1992; Barling, Weber, and Kelloway, 1996; Reich and Benbasat, 1996; Bono and Judge, 2003). In a survey of employees across nine organizations, Fletcher and Williams (1996) found that leaders communicating their organizations' ultimate aspirations sometimes had a negative impact on employees' attitudes toward the meaningfulness of their work. Kirkpatrick and Locke (1996) also found inconsistent causal support for the effect of a leader's vision on employees' attitudes and performance. Similarly, research on goal setting has found mixed results. Although leaders who communicate their organizations' most far-reaching aspirations increase the motivation of their employees to pursue everyday goals in some cases (Locke, Latham, and Erez, 1988; Harackiewicz and Elliot, 1998), the usefulness of this tactic has been so equivocal that Locke and Latham (2009) submitted that they take no formal stance on whether leaders should communicate their organizations' most long-term goals in tandem with short-term goals.

To understand these inconsistent findings, it is useful to consider the distinction between the perceived significance of an organization's ultimate

aspirations and the ability of employees to see a connection between their daily work and those aspirations. According to research on leadership, an organization's ultimate aspirations are meaningful because they are timeless, far-reaching, and grand in scale (Bass and Riggio, 2005). Yet according to theory on planning and goal setting, day-to-day responsibilities are most manageable if they are time-constrained, narrowly defined, and small in scale (Ajzen, 1991; Locke and Latham, 2002). The various ways that an organization's ultimate aspirations and an employee's day-to-day work differ are likely to hinder employees' ability to see a connection between them because people have difficulty understanding the relationship between cognitive representations that are very different (Miller and Charles, 1991). For example, one KPMG employee struggled to see the link between his deadline-driven project work and his company's mission of "turning knowledge into value" (Feintzeig, 2015). Further, it may be difficult to bridge the gap between everyday work and ultimate aspirations because such aspirations are likely to feel psychologically distant. In the modern economy, leaders look to position their organizations in a competitive marketplace by aspiring toward ambitious aims that often subsume hundreds or thousands of employees, are set across long time horizons, and have the potential to reach an untold number of beneficiaries (Collins and Porras, 1994). Although employees recognize that these timeless, far-reaching, and abstractly defined aspirations (such as "promoting health and healing in the world") are extremely meaningful because they speak to lasting achievements and a broad impact (Geyery and Steyrer, 1998), people typically perceive phenomena that reside well beyond their immediate social and physical reality to be disconnected from their lives (Trobe and Liberman, 2010).

A logical extension of these arguments is that the messages leaders use to convey the organization's ultimate aspirations present a paradox: the very properties that make ultimate aspirations meaningful are those that leave employees unable to sense how their daily responsibilities are associated with them. Employees are likely to perceive the organization's ultimate aspirations as more significant than the time-constrained goals they work toward each day—yet also severely disconnected from them. This paradox echoes the tradeoff between meaningfulness and manageability (McGregor and Little, 1998), which relates to how a sweeping goal on a grand scale may be extremely meaningful but difficult to negotiate because it is "far removed from a schedulable act" (Little, 2011, quoted in Cox and Klinger, 2011). More troublingly, an ultimate aspiration that appears disconnected from daily work may represent not only an unrealized source of motivation but also a source of disillusionment. The grand scale of an ultimate aspiration may present employees with a negative point of comparison for their work, leading their daily responsibilities to appear more mundane by contrast (Schwarz and Bless, 1992). This may help explain the "vision trap" (Langelier, 1992) that occurs when a leader's rhetoric about the organization's ambitions yields a dispirited and demotivated workforce (Simons, 1999). To understand how leaders can help employees overcome this paradox, I undertook an inductive analysis of how President John F. Kennedy and other leaders of NASA in the 1960s communicated to employees about NASA's ultimate aspirations.

HELPING EMPLOYEES CONNECT THEIR WORK TO THE ORGANIZATION'S ULTIMATE ASPIRATIONS

Organizational goals are commonly thought to exist along a hierarchy, ranging from short-term performance targets (e.g., weekly production quotas) to objectives set along a timespan of several years, to the ultimate aims that constitute the organization's timeless ambitions (Cropanzano, James, and Citera, 1993). When examining rhetoric used by leaders, scholars often focus on the top of the organizational goal hierarchy (Nemanich and Keller, 2007), which I refer to here as the organization's ultimate aspirations. Among all organizational goals, ultimate aspirations provide the greatest potential for imbuing day-to-day work with meaningfulness. Although all goals at the organizational level (including strategic objectives) have a built-in sense of gravitas because they are technically superordinate to all organizational functions, the pursuit of ultimate aspirations has the potential to affect the largest number of beneficiaries and last the longest. Further, ultimate aspirations have abstract connotations (e.g., "healing the world" or "advancing science") that lower-order organizational goals do not. Employees view these connotations as especially meaningful because they epitomize the organization's enduring values and speak to an underlying ideology (Bateman, O'Neill, and Kenworthy-U'Ren, 2002).

Although ultimate aspirations are central to organizational phenomena because organizations are collectives organized to achieve goals (Parsons, 1956), existing research cannot easily address the question of how leaders help employees see the connection between their everyday work and the organization's ultimate aspirations so that their work becomes more meaningful. Research on transformational leadership (Bass and Riggio, 2005), charismatic leadership (Shamir, House, and Arthur, 1993), sensegiving (Oswald, Mossholder, and Harris, 1997), and other classic leadership perspectives (Selznick, 1957; Barnard, 1968) describes how leaders who most effectively motivate their employees do not simply assign work responsibilities but inspire persistence by communicating transcendent messages about the organization's ultimate aspirations. An assumption of these perspectives is that employees will not only buy into the importance of these ultimate aspirations but will see how their work is connected to them, especially if the aspirations are congruent with their own values and sense of identity. As a result, little research has suggested that leaders need to take explicit steps to help employees see the connection between their work and the organization's ultimate aspirations, and the research that has broached this topic has not highlighted *how* leaders can help employees forge this connection (Boswell and Boudreau, 2001; Zhang and Bartol, 2010). In a related vein, path-goal theory is partly centered on how leaders remove obstacles that prevent employees from attaining short-term goals (House and Mitchell, 1974), yet it does not provide insight into how leaders help employees see the link between their work and these near-term goals, not to mention the link between everyday work and goals that are so far-reaching that they have no defined timeline (i.e., ultimate aspirations).

Research that has integrated leadership and construal level theory offers insights that are similarly relevant to this question but also do not provide an answer to it. According to construal level theory, people tend to think about the near term concretely and the far term abstractly (Trope and Liberman, 2003). Integrating this idea with theory on leader communication, Berson et al. (2015:

143) argued for “construal fit”: upper echelon leaders boost the motivation of followers when communicating “abstract, far-reaching, and timeless messages” rather than “specific, challenging, and time-constrained objectives.” This argument reinforces research suggesting that breadth and timelessness are defining features of leader communication about ultimate aspirations (Greer et al., 2012; Stam et al., 2014; Baur et al., 2016), yet these same attributes make ultimate aspirations seem far removed from everyday work’s short-term objectives (Berson and Halevy, 2014). Focusing employees’ attention on a near-term goal that work serves is not a clear fix: even though a near-term goal (e.g., reaching a monthly sales objective) helps explain why someone engages in day-to-day work, it lacks the abstract connotations and timelessness typically associated with ultimate aspirations (Stam et al., 2014).

Research on leadership and goal hierarchies may provide further clues as to how employees perceive the link between day-to-day work and the organization’s ultimate aspirations. As noted, a goal hierarchy involves multiple orders of goals, from low-order action steps to ultimate aspirations. Although there are models of top managers’ goal hierarchies (Bateman, O’Neill, and Kenworthy-U’Ren, 2002) and employees’ cognitive representations of goal hierarchies (Bagozzi, Bergami, and Leone, 2003), there is little work on how top managers influence their employees’ representations of goal hierarchies. Cropanzano, James, and Citera (1993) made an important contribution in this regard by suggesting that different actions by leaders induce individuals to adopt goals at different levels of abstraction. For example, charismatic leadership causes employees to focus on abstract value states, whereas actions associated with management-by-objectives lead employees to adopt near-term goals. Yet this research did not clarify how employees see a link between these distinct levels of the goal hierarchy. More recently, Bateman and Barry (2012) examined how employees pursue both short-term goals and ultimate aspirations in parallel. Yet while some of the employees they studied appeared to see a close connection between daily work and ultimate aspirations, others did not, and it is not clear what accounted for these differences. In particular, it remains unknown how leaders helped—or possibly even impaired—employees’ ability to see this connection.

A separate stream of research tied to how leaders implement strategy is also relevant. Reflecting the literature on small wins (Weick, 1984), strategic planning (Miller and Cardinal, 1994), and organizational design (Burton, DeSanctis, and Obel, 2006), some of this work has focused on the process of “cascading”—breaking down an organization’s ultimate aspirations into smaller components, including projects and jobs (Hannan, Pólos, and Carroll, 2003). Yet this research has not examined how a cascade should be communicated to employees so they perceive the link between their everyday work and the organization’s ultimate aspirations. Meanwhile, other research closely related to cascading also does not provide clarity on how employees can see this link. Theory on goal setting (Locke and Latham, 1990), planning (Ajzen, 1991), self-regulation (Carver and Scheier, 1998), and intermediate goals (Amabile and Kramer, 2011) suggests that employees thrive when they are able to work through a comprehensive set of action steps or small wins that “emphasize the accomplishment of more concrete, contextual goals,” because such plans provide well-defined parameters for success (Stam et al., 2014: 1181). Given that the purpose of a plan is to reduce the discrepancy between the status quo

and a given goal, it is generally assumed that leaders should closely oversee this process by communicating as much plan detail as possible (Armstrong, 1982; Miller and Cardinal, 1994). To illustrate, one study found that individuals performed effectively when they enacted a majority of 33 possible tactics to guide approximately 630 decisions on a short-term task related to selling appliances (Chesney and Locke, 1991). Further, Masuda, Locke, and Williams (2015) found that performance on one short-term task was enhanced at an increasingly rapid rate as more strategies were introduced because individuals were better able to build synergies between strategies. Yet while intricate action plans may facilitate strategy implementation and self-regulation for short-term tasks, it is unclear how they can help individuals perceive a connection between their work and the organization's highest aims, especially given that a preponderance of action steps can consume the finite cognitive resource of attention (Ocasio, 1997). For example, one employee in a qualitative study by Bateman and Barry (2012: 995) noted that "we actually have so many short-term goals that it is very hard to think about that long-term goal."

It is also important to consider insights beyond the leadership literature. Researchers have examined how properties of jobs can be altered to make work more closely aligned with employees' values and needs. Two of these approaches are particularly relevant. The first, task identity, exists when an individual employee has the opportunity to contribute to various aspects of a product or service and then see it in its final form or complexion (Hackman and Oldham, 1980). A classic example involves an assembly-line employee performing different roles in manufacturing a car (putting in axles, installing seatbelts, painting the exterior) and then seeing the car in its final form. They can thus extrapolate how their work contributed to the final product. The second, task significance, exists when employees see that their work has a positive impact on the lives of others (Grant, 2008). Because both aspects of job design involve mechanistic changes to the way work is configured, they do not provide insight into the way employees understand how their work connects to abstract ideals. Yet it is abstract connotations of high-order thinking (e.g., notions of "changing the world" or "being on the frontier of innovation") that characterize the meaningfulness gained from an ultimate aspiration (Shamir, Arthur, and House, 1994). Additionally, job design focuses on tasks completed by individuals and teams and thus does not shed light on how employees sense how hundreds or thousands of tasks performed by disconnected individuals throughout the organization are synthesized across long stretches of time (Bateman, O'Neill, and Kenworthy-U'Ren, 2002). Further, task identity and task significance are relevant only in certain contexts. With respect to task identity, it is not always possible for a single individual to perform different task functions, especially in highly specialized environments. With respect to task significance, it is difficult for employees to see the social impact of achievements and events that are years away from being realized (Grant and Parker, 2009). Further, not all ultimate aspirations feature people as direct beneficiaries.

Other research focuses less on the role of leaders in crafting rhetoric and redesigning work and more on the role of employees as active agents who strive to connect their work to end-states that are consistent with their own values. Employees can bring work in line with their value system by changing their work (Wrzesniewski et al., 1997), the characteristics of their work (Wrzesniewski and Dutton, 2001), or how they think about their work (Ashforth

and Kreiner, 1999; Sonenshein and Dholakia, 2012). Yet these approaches often focus on how employees connect their work to personal end-states (e.g., fulfilling a calling) and thus do not clearly inform how they build a connection to the organization's end-states. Yet for individuals from various specializations to be properly coordinated, they must focus on the same ends (the organization's) so that they generate meaning collectively (Weick and Roberts, 1993; Carton, Murphy, and Clark, 2014). And even employees who are motivated to build a connection between their work and the organization's ultimate aspirations still must confront the inherent difficulty of doing so, given how psychologically distant ultimate aspirations appear to be. Perspectives that cover employee proactivity do not speak to how this can be achieved. Further, it is critical to understand how employees construct a connection between their work and the organization's ultimate aspirations when their responsibilities are relatively fixed and subject to managerial dictates or other organizational constraints. Because it is not always possible to enact behavioral coping mechanisms (changing the nature of work to be more in line with the organization's ultimate aspirations), it is essential to understand approaches that involve altering perceptions. One such approach that is critical to understand is how leaders can help employees perceive a connection between their day-to-day work and the organization's ultimate aspirations so that they perceive their day-to-day work to be more meaningful. My inductive analysis of leadership at NASA in the 1960s was designed to uncover how leaders can achieve this.

METHOD

An inductive analysis can unearth thick descriptions of unknown psychological processes (Bluhm et al., 2011) and can serve as the basis for building theory to address existing problems (Lee, Mitchell, and Sablinski, 1999). To understand how daily work can seem connected to the organization's ultimate aspirations, it would be best to deconstruct a case in which employees were able to perceive this connection. The pursuit by the U.S. National Aeronautics and Space Administration (NASA) in the 1960s to land on the moon represents one such occasion. The U.S. was the first country to put a person on the moon when Neil Armstrong bounded from the *Apollo 11* staircase onto the lunar surface on July 20, 1969. I was drawn to this case after reading a book (Chaiken, 2007) in which several NASA employees attested to feeling strongly connected to the organization's goals and aspirations—a perception many said they had never experienced outside of this period at NASA. The robust amount of archival data available from this historical period allowed me to explore how leaders' actions and employees' perceptions evolved across an extended period of time (Bluhm et al., 2011). Further, NASA leaders regularly spoke of the organization's core objectives and aspirations. In this way, NASA represented an extreme situation in which "the process of interest is 'transparently observable'" (Eisenhardt, 1989: 537; see also, Bamberger and Pratt, 2010). Additionally, as Hargadon and Douglas (2001) argued in their study of Thomas Edison, historical cases are useful because there is reduced risk that informants are vying to manage impressions. Such cases also leverage original sources and effectively feature the role of time (Siggelkow, 2011; Rowlinson, Hassard, and Decker, 2014). Nevertheless, there are limitations to the use of a case study of a bounded historical period. Broader cultural forces that infused NASA's endeavors (e.g., the

Cold War) may prevent certain insights from generalizing to current times. Further, the narratives that emerged during this time may have been influenced by NASA's successes and failures. In particular, employees who had negative experiences may be difficult to access given that NASA was ultimately successful in its objective of landing on the moon. The use of an extreme case also raises concerns related to how the findings may translate to other organizational contexts (Lincoln and Guba, 1985). I discuss below the steps I took to address the unique challenges of this case.

Data Collection

I began by searching for archival sources that covered leaders' communication about NASA's ultimate aspirations and employees' perceptions of day-to-day work at NASA in the 1960s before the moon landing. I soon realized that it was impossible to sample exhaustively the hundreds of thousands of pages of archived records and hundreds of video clips and books. I thus narrowed my focus to four themes that directed my search for data. The first theme, day-to-day work, involved the circumscribed tasks and activities that occupied each individual's daily routine. Second, organizational objectives and ultimate aspirations are what organizations aspire to attain via their internal activities; I kept my search open to organizational objectives (i.e., goals formulated as outcomes or events) in case leaders used them to help employees see how their work was connected to the organization's ultimate aspirations. For the third theme, connections, I tracked how leaders helped employees build perceived connections between day-to-day work and ultimate aspirations and goals that served as intermediate steps. I remained open to any property of connections (Klein, Moon, and Hoffman, 2006)—including the number and strength of connections and perceived causal connections—as any type of connection could provide insight into the relationship between day-to-day work and ultimate aspirations (Maitlis and Christianson, 2014). The fourth theme, meaningfulness, relates to the perceived significance of work and can be experienced as an affective or cognitive state (Johnson, Morgeson, and Hekman, 2012). Affectively, it involves positive emotions that connote significance (e.g., "pride"). Cognitively, it is the assessment that a target of action is worthwhile and significant. I focused on attributions of the meaningfulness of day-to-day work and the organization's objectives and ultimate aspirations. I combed for data by using various search terms that reflected each theme, using terminology from the extant literature as a guide. For instance, to collect data on ultimate aspirations, I used terms such as "end-state" and "ultimate goal."

One key data source consisted of about 60 documents, each 150–300 pages long, initially released by NASA's public information office in the 1960s and then archived at nasa.gov, in which NASA synthesized news releases, transcripts of discussions, and internal memos. I also sampled from approximately 100 other online sources, including five transcripts of onboard communication; 20 webpages from the U.S. public broadcasting system consisting of employees' commentary on scientific advances before the moon landing; five audio recordings featuring John F. Kennedy and lower-level NASA employees; 4.5 hours of documentary footage; 95 published interviews; three webpages from online university archives; and 800 pages in books containing information on employees' perceptions in the 10 years before the moon landing. With three

exceptions (two interviewers who paraphrased original quotes from astronauts and one description of a written message), I exclusively sampled original spoken and written dialogue. I supplemented this search with archival data obtained on two field visits to Houston, Texas. On one visit I examined about 680 pages of documents at the NASA archives at the University of Houston–Clear Lake, many of which could be accessed only in person. On the other visit, I went to NASA headquarters to obtain an estimate of the layout of mission control in the 1960s to help me understand how the head of mission control, Owen Maynard, visually communicated key information to employees. The majority of the data I collected originated before 1970.

Although NASA was dominated by engineers and astronauts, early in my data collection I noticed that employees from all functions, including administrators, clerks, and accountants, were profoundly influenced by NASA's ultimate aspirations. I thus sought to keep my data representative of NASA's engineering and aeronautical focus yet broad enough to capture the experiences of employees in other roles. Doing so would allow me to generate insights about how employees with varied backgrounds and responsibilities saw the connection between their day-to-day work and NASA's ultimate aspirations.

Data Analysis

The four themes that guided my efforts to collect data had no bearing on the subsequent coding, in which I was guided by the data in my effort to uncover insights (Strauss and Corbin, 1998; Locke, 2001). All content that was not originally in text form was transcribed. Consistent with Suddaby and Greenwood's (2005: 43) distillation of excerpts of text from archival sources, the individual coding units in my analysis were "discrete data segments ranging from a few words to several paragraphs" that encapsulated (1) any attempt by a leader to influence other employees' thought processes related to any of the four categories or (2) employees' perceptions pertaining to any of the four categories.

I coded the data in three stages, first coding the raw data and then extracting theoretical principles that grouped these codes together (Strauss and Corbin, 1998; Gioia, Corley, and Hamilton, 2013). The progression of the coding is detailed in table 1. Open codes involved original language used by NASA employees or, in certain cases, descriptions of actions they took. Axial codes united the descriptive codes. These categories evolved as I iterated among the raw data, axial codes, and the existing literature. Although historical cases provide benefits related to understanding extreme situations, accessing a broad spectrum of data, and tracking the evolution of behaviors and perceptions across an extended period of time, they present challenges related to the dependability of the data (Diesing, 1979; Lincoln and Guba, 1985; Reay, Golden-Biddle, and Germann, 2006). To increase confidence that the emergent codes faithfully reflected the experiences of NASA employees (Golden-Biddle and Locke, 1993), I took several steps. First, I specified the criteria that defined each coding category, as shown in table 2, to ensure that each descriptive code reflected the core features of the axial code it represented. Although the axial codes were emergent, formulating these explicit criteria post hoc served as a check that lent greater confidence to the iterative process I used to make inferences from the raw data. I then identified the aggregate theoretical dimensions in table 1 that represented groupings of axial codes. Altogether, this process

Table 1. Progression of Coding of Discrete Data Segments

| Open code | Axial code | Aggregate construct |
|---|---|------------------------------|
| <p>"Identify a few (the fewer the better) goals in our space program."</p> <p>Kennedy refines ultimate aspiration to advance science by exploring the solar system</p> <p>"Our aim . . . is to develop in a new frontier of science."</p> | Reducing number of ultimate aspirations | Leader sensegiving |
| <p>"Scientific exploration of the moon and planets should be clearly stated as the ultimate objective" (this was an early version)</p> <p>"this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to the Earth." (this version was adopted)</p> <p>"man's ancient desire—his feet upon the surface of the Moon."</p> | Shifting attention to concrete objective | |
| <p>Kennedy sets Mercury, Gemini, and Apollo as successive programs</p> <p>Owen Maynard posts A-F Apollo milestones on blackboards around NASA headquarters (late 1960s)</p> <p>"The achievement of this significant milestone in our lunar landing program is . . . a great tribute."</p> | Communicating milestones | |
| <p>"direct observations on the Moon will initiate a new phase in man's quest for knowledge."</p> <p>"new hopes for knowledge and peace are there."</p> <p>"the overriding concept underlying this program is that of driving forward the advancing front of science."</p> | Affixing ultimate aspiration to objective | |
| <p>" . . . it's so close."</p> <p>"I almost feel I can reach out and touch it."</p> <p>"this is going to happen soon."</p> | Proximity | Employee connection building |
| <p>"The gap between 20 minutes—a 20 minute up and down flight—and going to the moon was something that was almost beyond belief" (no stepping stones)</p> <p>"Everything was stepping stones to the Moon, going on up there."</p> <p>"Each mission built upon the success of the past mission."</p> | Stepping stones | |
| <p>"You had the top scientists and engineers all with one goal. . . . As I saw my job, it was the engineering of the science."</p> <p>"The Apollo missions were like a giant jigsaw puzzle where every piece, no matter how small or large, had its place. My role in the puzzle, although small, was a necessary activity."</p> <p>"I worked as a systems engineer. . . . There was a great pride among all of us and we all worked together as a team regardless of what company we worked for. . . . I was very lucky to be part of it."</p> | Clarity of individual contribution | |
| <p>"we've got that man to get to the moon" (partial reconstrual)</p> <p>"we're going to the moon"</p> <p>"we're putting a man on the moon"</p> | Reconstruing work as objective | |
| <p>"a project provides a creative and driving force in the total achievement of science"</p> <p>"we . . . continue to expand our knowledge of the universe, hopefully for the benefit of all mankind"</p> <p>"the summit of scientific progress"</p> | Reconstruing work as ultimate aspiration | |

Table 2. Criteria for Emergent Axial Coding

| Axial code | Emergent criteria |
|---|---|
| Reducing number of ultimate aspirations | Ultimate aspirations must be organization-wide Ultimate aspiration typically had to be communicated by individuals with sufficient power (e.g., upper echelon leaders), as they had the greatest license to influence organization-wide messages |
| Shifting attention to concrete organizational objective | Concreteness is defined as observable nouns (people, places, and objects) and observable verbs (e.g., actions, events) (Guadagno, Rhoads, and Sagarin, 2011) Concreteness increases if an event is a single instance at a single point in time (Feldman, 1978) |
| Communicating milestones | Must relate to subgoals or phases that serve as intermediate steps between current state and achievement of objective Had to be celebrated as significant in and of themselves, thereby to distinguish from other intermediate steps |
| Affixing ultimate aspiration to objective | Abstract ideals must represent end-states that are closely tied to organization’s ultimate aspiration (Rokeach, 1973) Although rhetoric is not intended to be interpreted literally, the literal interpretation is that abstract ideals physically co-exist alongside concrete entities or on real-life physical locations. This can be used in tandem with other figures of speech, including metaphors, analogy, and allegory. |
| Proximity of objective | Should satisfy at least one of two components of proximity: spatial or temporal (Nisbett and Ross, 1980; Trope and Liberman, 2010) |
| Stepping stones | Must relate to objectives that serve as intermediate steps between day-to-day work and achievement of objective. Each step must be explicitly connected to at least one other step or the objective, or both Must indicate plausible pathway between daily work and achievement of another step or objective |
| Clarity of individual contribution | Must include reference to objective (as defined above) that is held by more than one party through terms such as “joint goal,” “common goal,” “shared goal,” “common purpose” Indicate that at least two distinct parties with distinct specializations worked interdependently toward common end, and the person sees his or her contribution within that aggregate effort |
| Reconstruing work as organizational objective | Partial reconstrual: objective is cognitively salient (e.g., the phrase “back of our mind” was mentioned) but people refer to it in the future tense (e.g., “we’ve got to get that man to the moon”) Complete reconstrual: day-to-day work is identified in terms of the objective. Speech is in the present tense (“we’re putting a man on the moon”) |
| Reconstruing work as ultimate aspiration | Must use terms related to symbolism, including “symbolize,” “represent,” “monument,” and “beacon” Must represent an ideal tied to ultimate aspiration Complete reconstrual: day-to-day work identified in present tense as ultimate aspiration |

mirrored other scholars’ coding of archival data, including Suddaby and Greenwood’s (2005) method of using archival records to induce first-order and second-order codes (see also Gioia et al., 2010; Harrison and Corley, 2011). I proceeded with coding until theoretical saturation, when the analysis of additional data led to no new insights (Glaser and Strauss, 2008).

Second, I prioritized data that were most likely to represent leaders' actions and employees' perceptions in situ in the following order: (1) contemporaneous data (from the period between NASA's founding and the moon landing, October 1, 1958 to July 20, 1969), (2) retrospective recollections (after 1969) about what was said before or during the moon landing (when someone quotes a phrase that they or others said, in present tense, as it was said at the time), (3) retrospective recollections of what individuals perceived or felt before or during the moon landing, and (4) purely retrospective comments. I required there to be at least one contemporaneous fragment of data as a basis for each axial code. For data from interviews, I almost always had access to the entire interview and thus to interviewers' questions. For the categories related to how individuals perceived their daily work or the connection between their daily work and the organization's goals, I selected data in which individuals were asked to recount their day-to-day actions and downplayed responses when they were asked to discuss only the organization's objectives and ultimate aspirations. This prevented me from coding data in which employees may have been primed to think about the connection between work and ultimate aspirations by how the question was framed, helping to address one of the concerns of relying on retrospective data (Hargadon and Douglas, 2001).

I then checked the validity of my coding with trained raters. Pratt (2009) noted that checking for interrater reliability in some forms of qualitative research is valuable, in particular when coding archival data, because the researcher is not the original collector of the data. Given that the constructs I am exploring are presumed to be enacted in a similar way by different people, it stands to reason that multiple individuals would recognize and code these constructs in a similar way. Following this guidance, I trained two research assistants to code the raw text excerpts according to the emergent criteria of each category shown in table 2. They coded 60 randomly selected excerpts, a subsample large enough to capture all of the coding categories and data sources. Interrater reliability was strong when comparing my ratings with both the first rater ($Kappa = .78$) and the second rater ($Kappa = .96$). This level of reliability is consistent with that in prior qualitative research (Treviño et al., 2014) as well as longstanding guidelines for content analysis (Cohen, 1960). I probed the few instances of discrepancies between the raters' coding and my coding by following Gioia et al. (2010) in resolving disagreements by discussing them with the coders until we reached a unanimous decision on how to code each discrepancy. As a final step toward ensuring "confirmability," I asked six scholars who publish inductive research in top management journals to audit the data presented in the paper as well as my interpretations of them to check the coherence of the theoretical model (Lincoln and Guba, 1985; Tracy, 2010).

FINDINGS

My analysis culminated in a grounded model with four leader sensegiving actions (oral or written messages provided by leaders) and five stages of connection-building (a process during which employees built an increasingly strong connection between day-to-day work and NASA's ultimate aspirations). To gain a better understanding of the interrelationships between the constructs that emerged during the content analysis, I employed narrative causality. Consistent with narrative explanation (Abell, 2004) and stream analysis (Porras,

1987), a useful way to understand causality in the context of perceptual constructs is to focus on employees' own attributions of causality. On numerous occasions, employees attributed the process of connection-building to specific forms of sensegiving enacted by NASA leaders. These represented subjective causes. Employees also remarked on how connection-building influenced important outcomes, including the meaningfulness of work. These represented subjective consequences. Employees often made these inferences retrospectively; indeed, the distance of hindsight was usually required to understand consequences and was also helpful for sensing causes. Thus during this stage of the analysis I drew more heavily on retrospective data.

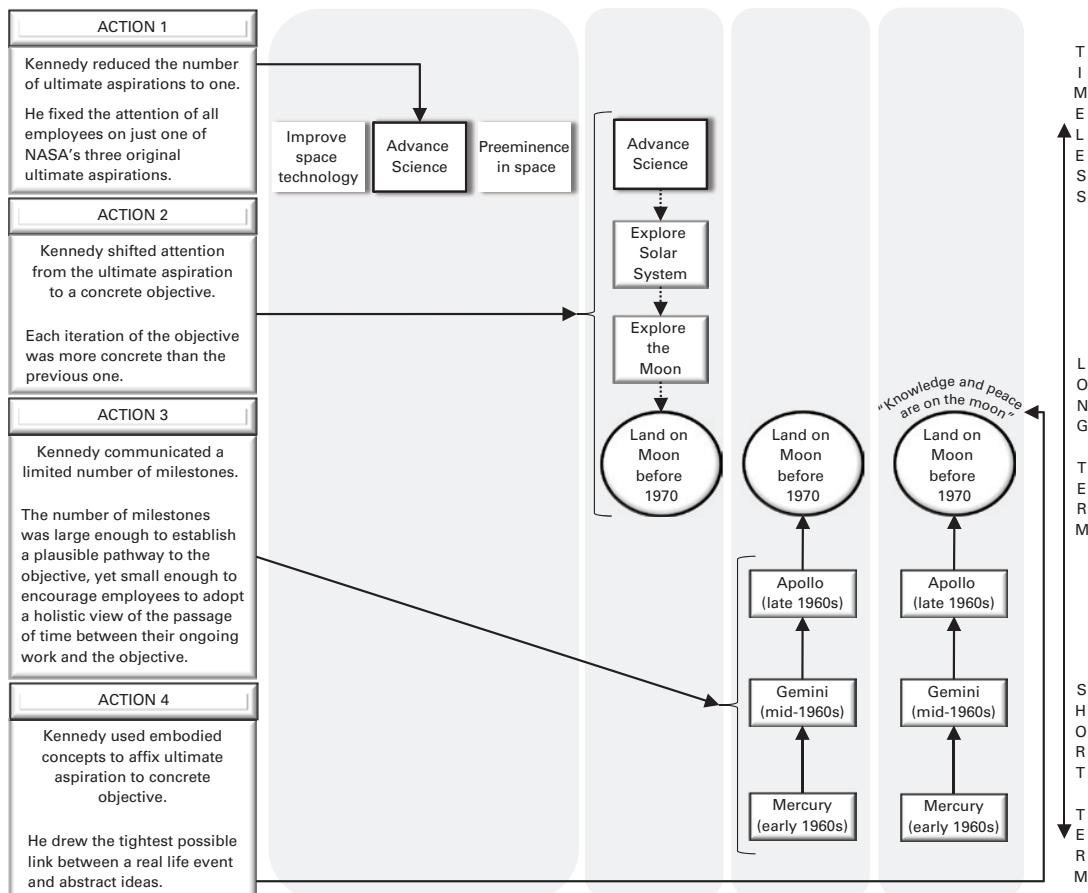
Four Leader Sensegiving Actions

In this context I define sensegiving as a discursive tactic in which leaders outline the relationships between daily work and NASA's intermediate goals, objectives, and ultimate aspirations.¹ Specifically, NASA's leaders engaged in four actions that built on each other across time to reveal a coherent "structural blueprint" of the relationships between NASA's various goals, as summarized in figure 1. I detail the four steps in the order in which they were enacted. Although I was originally open to the possibility that lower-level leaders would be positioned to help employees build connections between their work and the organization's goals because of their direct and proximal supervisory role (House, Filley, and Kerr, 1971; Zhang and Bartol, 2010; Berson et al., 2015), I discovered that all of the sensegiving actions that positioned employees to see how they personally contributed to the organization's ultimate aspirations were engineered by those responsible for generating organization-wide goals (upper echelon leaders). Above all others, John F. Kennedy was the primary architect for all four sensegiving steps.

First sensegiving action: Kennedy reduced the number of NASA's ultimate aspirations to one. NASA was founded in 1958. Before Kennedy became U.S. president in January 1961, NASA established three ultimate aspirations (National Aeronautics and Space Act, 1958; Pickering, 1958): (1) improve space technology to meet national interests in space, (2) achieve preeminence in space for the United States, and (3) advance science by exploring the solar system. These were ultimate aspirations because they would govern all organizational activity on a timeline that was presumed to be permanent. Although these three ultimate aspirations were related, they would each require some unique tactics. For instance, the U.S. would need to master undertakings outside of enhancing technology and exploring the solar system to achieve preeminence in space, especially relative to the Soviet Union, which at the time had a broader portfolio of projects. In February 1961, Kennedy took the first sensegiving action shown in figure 1 by reducing the number of NASA's ultimate aspirations from three to one. Specifically, he chose the third ultimate aspiration—advance science by exploring the solar system—as the single overriding aspiration that should govern all of NASA's efforts (Kennedy, 1961a). Pursuit of this ultimate aspiration may have indirectly boosted the other

¹ Although the term "sensegiving" has been used to cover an array of discursive tactics beyond communicating about goals, for the purposes of this study I focus on leaders' communication about organizational goals.

Figure 1. The leader as an architect: How Kennedy developed a structural blueprint of core connections via four sensegiving actions.



two ultimate aspirations, but neither of them would be directly pursued. Kennedy's focus on a single ultimate aspiration was reinforced by guidance from Wernher von Braun, director of NASA's Marshall Space Flight Center, who advised Kennedy that it was critical for NASA to "identify a few (the fewer the better) goals in our space program . . . put all other elements of our national space program on the 'back burner'" (von Braun, 1961). In his subsequent communications, Kennedy emphasized that there was a single ultimate aspiration by employing singular nouns: "Our aim . . . is to develop in a new frontier of science" (Kennedy, 1962a).

Second sensegiving action: Kennedy shifted attention from NASA's ultimate aspiration to a concrete organizational objective. In late spring 1961, NASA leaders began to shift focus from an ultimate aspiration, which is by definition abstract, to a concrete organizational objective. At first, NASA articulated an objective that was slightly more concrete than the aforementioned ultimate aspiration, specifying that "[s]cientific exploration of the moon

and planets should be clearly stated as the ultimate objective of the U.S. space program for the foreseeable future" (NASA Space Science Board, 1961). Kennedy proceeded to update the objective from "exploration of the moon and planets" to simply exploration of the moon (NASA, 2014). He then began to contemplate an organizational objective that was even more concrete. On May 5, 1961, Alan Shepard became the first American to reach space via a suborbital flight. Soon after, Shepard spoke with Kennedy about NASA's focus. Shepard provided the following account:

In the oval office, there were the heads of NASA there and the heads of government . . . Jack [Kennedy] is in the rocking chair, and I'm telling him how I was flying the spacecraft . . . toward the end of the conversation he said to the NASA people, "What are we doing next? What are our plans?" And they said, "There were a couple of guys over in a corner talking about maybe going to the Moon." He said, "I want a briefing." (NASA, 1998a)

At this point, Kennedy was prompted to craft a highly concrete and time-delimited objective, which he communicated to Congress in an address on May 25, 1961: ". . . this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the earth" (Kennedy, 1961b). This objective would subsequently be the focus of attention across all of NASA for the next eight and a half years. Like Kennedy, others began to emphasize the preeminence of this objective, providing concrete snapshots of a real event that would occur prior to 1970. For instance, in early 1962, a NASA administrator said he was hopeful that NASA would soon achieve "man's ancient desire—his feet upon the surface of the Moon" (NASA, 1962a). Notably, although it was more concrete and time-constrained than the ultimate aspiration, this objective was still clearly within the content domain of NASA's ultimate aspiration of advancing science by exploring the solar system.

Third sensegiving action: Kennedy communicated milestones connecting employees' day-to-day work to the concrete objective. Prior to 1961, NASA's only program was called Mercury. By early 1962, Kennedy launched Gemini and Apollo to build on Mercury. Together, they constituted the Manned Lunar Landing Program. As Albert Siepert, then deputy director of the space center, noted in 1964, this decision was enacted solely by Kennedy: "he, all alone, and on the recommendation of then Vice President [Lyndon] Johnson, made a key decision as far as we are concerned—that, of course, is the Manned Lunar Landing Program" (NASA, 1964a). Each program was built to realize a key milestone. The goal of Mercury was to put a person in Earth's orbit, the goal of Gemini was to perform docking in space, and the goal of Apollo was to build all remaining capabilities needed to land on the moon. In this way, Kennedy set in place three milestones that illuminated a pathway to the moon.

After transitioning to Apollo, there were no more intermediate programs that could serve as milestones. Thus in November 1967, Owen Maynard, chief of mission operations, followed the example set by Kennedy several years earlier and outlined six new milestones connecting their present-day work and landing on the moon (Woods, 2011). He wrote them on blackboards all over NASA

headquarters in Houston, one above the other—the first milestone at the bottom, the sixth on top—such that they represented a “ladder to the moon” (Chaiken, 2007):

- F missions: manned tests in lunar orbit
- E missions: manned tests in high earth orbit
- D missions: manned orbital tests of lunar module and command module
- C missions: manned, earth orbital tests of the command module
- B missions: unmanned tests of lunar module
- A missions: unmanned tests of Saturn V rocket

Fourth sensegiving action: Kennedy used embodied concepts to affix NASA’s ultimate aspiration to the concrete objective. In 1962, Kennedy connected the concrete objective of landing on the moon to NASA’s ultimate aspiration of advancing science, using rhetorical language, as in this speech at Rice Stadium in Houston, Texas:

Why, some say, the moon? Why choose this as our goal? And they may well ask why climb the highest mountain? Why, 35 years ago, fly the Atlantic? . . . We choose to go to the moon . . . because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone . . . space is there, and we’re going to climb it, and the moon and the planets are there, and new hopes for knowledge and peace are there. (Kennedy, 1962b)

In addition to emphasizing the impressive scale of the objective with metaphors (“space is there, and we’re going to climb it”) and analogies, comparing it with climbing the highest mountain, Kennedy used a figure of speech in which the literal interpretation was that abstract ideals were located in a real-life location (“new hopes for knowledge and peace are there”). That is, Kennedy talked as if the abstract concepts of knowledge and peace physically exist on the moon and thus can be observed. This is a paradoxical notion because an abstract concept is by definition not real. Yet through his rhetoric, Kennedy moved beyond the idea that a concrete objective and an ultimate aspiration are consistent with each other yet still distinct from one another. Rather, he made the abstract and the concrete inextricably intertwined. This rhetorical technique most closely resembles the “embodied concept” (Roth and Lawless, 2002), in which orators move beyond metaphors (“heart aches”) (Cornelissen, 2005) to explicitly locate abstract ideas in the body (e.g., “heart full of sadness”).

Kennedy’s rhetoric influenced other leaders at NASA, who used metaphors and allegory to emphasize the grandness of the objective’s scale and then used embodied concepts to affix the abstract to the concrete. When doing so, these leaders continued to invoke the same abstract notion (advancing science) yet oftentimes broadened it beyond NASA’s immediate domain (space exploration) to more universal themes related to scientific achievement and the success of humankind. For example, Richard Nixon, Kennedy’s successor as president, said the moon landing would represent how “the heavens have become a part of man’s world” (Nixon, 1969), and Eugene Shoemaker (1966), chairman of the Selection Panel, explained that “since antiquity . . . the Moon has occupied an

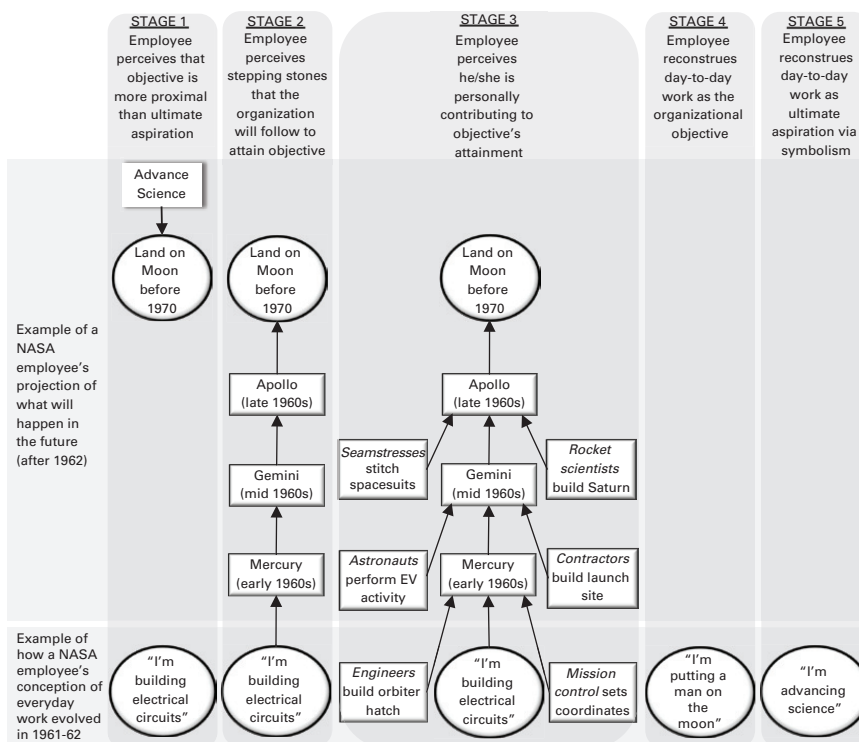
honored place in the minds of men," and "direct observations on the Moon will initiate a new phase in man's quest for knowledge."

Five Stages of Connection-building: How Employees Connected Their Day-to-day Work to NASA's Aspiration to Advance Science

Before Kennedy's sensegiving steps were enacted, employees focused on near-term goals. Documents from that period revealed that NASA employees spent most of their time discussing the technicalities of upcoming space flights, such as Wernher von Braun's focus on the protection of materials (e.g., metals and plastics) when traveling in space (von Braun, 1958). Similarly, in 1959, researcher Edward Jones talked about instrumentation, mapping coordinates, and vehicle operation (Jones, 1959). Employees did not mention any of NASA's three ultimate aspirations to explain why they engaged in the minutiae of their daily work. Astronomer Nancy Roman confirmed this short-term mentality: "At that time, the very first year or so or two years of NASA's growth, of course it was oriented toward small scientifically oriented . . . probes and that sort of thing. This is before Kennedy" (American Institute of Physics, 1980).

Although the day-to-day responsibilities of NASA employees from 1961 to 1969 were very similar to their responsibilities between 1958 and 1960, employees became more aware of how their work linked to NASA's broadest goals in 1961–1962, when Kennedy enacted the four sensegiving steps. My data indicated that employees constructed an understanding of how their work connected to the organization's ultimate aspiration (to advance science) in five stages. Each of these stages was triggered by the sensegiving actions initiated by Kennedy and reinforced by upper echelon leaders directly under his supervision, including James Webb and Owen Maynard. Kennedy did not directly oversee the process in which employees built a connection to NASA's ultimate aspiration. Instead, employees exhibited considerable agency in the connection-building process. Yet they regularly attested that Kennedy's sensegiving dictated the specific types of connections they constructed as well as when these connections were built, and they continued to attribute their connection-building to him through the late 1960s, several years after he enacted the four steps. Figure 2 depicts the five stages of connection-building. The top panel represents what an electrical engineer expected would take place in the remainder of the 1960s as he or she contemplated NASA's future while working in 1961–1962. The circles in the bottom panel illustrate how this employee's perceptions of his or her work evolved in 1961–1962, wherein the primary shifts in construal (meaning) occur in the fourth and fifth stages.

Stage 1: Proximity. At a briefing held in April 1961, John Houbolt (an engineer) noted that NASA's aspiration of advancing science via the space program "seemed very far away" (Hacker and Grimwood, 1977). Similarly, just before Kennedy made his "man on the moon" announcement, his close advisor Ted Sorensen mentioned that the notion of lunar exploration "is . . . far off" (PBS, 1999), suggesting that employees felt that NASA's ultimate aspiration of advancing science seemed distant. Immediately after Kennedy shifted attention from an ultimate aspiration to a concrete and time-constrained objective, employees reported that NASA's goal felt close rather than far according to two

Figure 2. Five stages of employee connection-building.

dimensions of proximity: space and time (Lieberman, Trope, and Stephan, 2007). In terms of spatial proximity, astronaut Michael Collins marveled at how NASA's objective was so proximate that "I almost feel I can reach out and touch it" (Cortright, 2009), and Max Faget (an engineer) observed how "it's so close" (PBS, 2000a). Despite being almost 240,000 miles away from Earth, a concrete objective seemed closer than an amorphous ultimate aspiration. The impression that the moon was spatially proximal was reinforced by the objective's proximity in time (NASA's projected date of landing). Wiley Williams, director of spacecraft operations, mentioned in 1966 that "this is going to happen soon" (NASA, 1966). Mathematician Beverly Cothren talked about going "to the moon in such a short time" (NASA, 2001a), and William Rice (an engineer) said that from start to finish the process was "barely seven years" (NASA, 2004). An objective with a deadline seemed more proximal than an aspiration set on an undefined timeline.

Subjective cause: How Kennedy's role as an architect triggered the perception of proximity. Employees perceived NASA's objective to be proximal because Kennedy shifted organizational members' attention to a concrete objective. The perception of proximity was not achieved via numeric targets; rather, Kennedy's words reflected observable reality and painted a verbal picture about an event that could one day happen. To this point, Max Faget (an engineer) mentioned that it is "so close . . . because everybody could see the moon" (PBS, 2000a), which is concrete. In this spirit, people "judge easy-to-

visualize goals to be closer than difficult-to-visualize goals” (Cheema and Bagchi, 2011: 109). Kennedy was also responsible for creating the sense of proximity in time because his “vision . . . had a deadline attached to it” (Gallo, 2012). For instance, astronaut Alan Shepard traced the temporal proximity of landing on the moon to Kennedy’s decision to “put a time cap on the deal . . . that was 1961—within 8½ years” (NASA, 1998b). Likewise, astronaut Gene Cernan noted that Kennedy “said, ‘We’re not just going to go to the moon, but we’re going before the end of the decade,’ which gave us eight and a half years” (Bella, 2015).

Subjective consequence: Impaired plausibility and decreased meaningfulness. Although Kennedy’s decision to shift attention to an objective was beneficial because its concreteness made it seem closer than the abstractness of an ultimate aspiration, this decision introduced a new challenge: because the objective was so difficult to reach, there did not at first appear to be a credible connection between day-to-day work and the moon. The proximity of the timeline was one of the factors that contributed to its perceived difficulty. As noted by engineer Glynn Lunney, “The whole moon goal was staggering. . . . Here we were struggling to get a 2,500-pound capsule up, and this thing he just assigned us was going to require getting 250,000 pounds into earth orbit. . . . Looking back on it, it’s just amazing that people were able to agree, ‘We’re going to the moon before the decade ends’” (Haise, 2007). Similarly, Neil Armstrong explained, “We had put only one flight, Alan Shepard, on a short 20-minute suborbital flight. . . . Never had a person in orbit and now the president was challenging us to go to the moon. The gap between 20 minutes, a 20 minutes up and down flight and going to the moon, was something that was almost beyond belief” (di Paolo, 2012).

Further, Robert Gilruth, of Manned Spacecraft, noted that a concrete objective led employees to realize that “[t]here could be no misunderstanding as to just what was desired” (Gilruth, 2009). Unlike a vague abstraction, a concrete objective created a clear distinction between success and failure. For instance, Eugene Kranz, NASA flight director, pronounced that “people talk about pass/fail—well, this is the ultimate pass/fail” (NASA, 2000b). Thus shifting attention to the objective of landing on the moon boosted one form of connection-building (proximity) but impaired another (plausibility of achievement).

Kennedy’s decision to shift attention to a concrete objective also impaired meaningfulness, because the objective lacked the value-laden connotations inherent in a broadly conceived ultimate aspiration. Accordingly, two NASA physicists wrote a memo in which they asked, “What are the positive values which we derive from this investment?” (Jastrow and Newell, 1963). Indeed, Roger Launius, chief NASA historian, noted that at first “a lot of scientists thought it was a waste of time and energy” (DNews, 2010). To address the negative impact that shifting focus to the moon had on the plausibility of achievement and meaningfulness while preserving the perception that the moon felt “close,” employees engaged in four more stages of connection-building.

Stage 2: Stepping stones. To establish a plausible pathway to an objective that initially seemed impossible, NASA leaders began to hone a strategy composed of thousands of steps that, if accomplished, would make the moon landing possible (e.g., “positioning aids, restraints, training, the suit technologies . . .

the anti-fog compounds to keep moisture off the faceplate”) (PBS, 2000b). Yet when so many steps were salient, employees were overwhelmed and unable to focus on the connection between their everyday work and the moon. As Neil Armstrong observed, “We’re focused on progress and making those incremental steps—thousands of little incremental steps. . . . And, uh, we’re looking for success in those steps, and you’re not focusing on that end-goal too much” (The Bottom Line, 2011). As he noted, the existence of thousands of subgoals directed employees’ attention away from the moon and toward each mini-step.

Conversely, when workers anchored on only three of the several thousand steps (the Mercury, Gemini, and Apollo missions outlined by Kennedy), they could still sense a plausible connection to the objective, yet their attentional field was no longer overwhelmed by subgoals, and thus they could stay mindful of the objective of landing on the moon. A small number of stepping stones can help establish a credible pathway while preventing employees from being bogged down by the detail of an extensive action plan. Now that they were able to compress an eight-and-a-half year stretch between their present reality and landing on the moon to only a few connecting links, they could quickly intuit a connection between their work and landing on the moon. One of the primary ways NASA employees used stepping stones to forge this connection was through visual-spatial metaphors, including “pathway to the moon” (NASA, 1969), “road to the moon” (Swanson, 1999), “building blocks” (Purser, 1961), and, most frequently invoked, “stepping stones” (Gilruth, 1961; NASA, 1963, 1966; PBS, 2000b). These metaphors were used to describe the three programs as successive phases that built on each other to establish a condensed passageway to the moon. For instance, in 1961, Paul Purser, assistant to the director, used “step” and “building blocks” in saying that “each step is important. Projects Mercury, Gemini and Apollo are major building blocks” (Purser, 1961).

Employees used the three stepping stones during the Mercury and Gemini programs to connect the dots between NASA employees’ present reality and the moon, as is evident in engineer Kenneth Kleinknecht’s observations about the Mercury program: “All these benefits derived from the Mercury Project are directly applicable to future manned space flight programs and provide a solid foundation on which to base the Gemini and Apollo programs” (NASA, 1963). By sensing the connection between each of the stepping stones, NASA workers saw how the first stepping stone (Mercury) set the stage for landing on the moon. As astronaut Wally Schirra put it, “These [Mercury] flights are transitional, evolutionary, leading us toward the one-day missions we expect to start flying next year, from there into Project Gemini, which will put two men into space for periods up to a week, and finally Apollo, our three-man spacecraft that will take us to the moon” (NASA, 1962b).

In the same way that NASA workers saw Mercury as a stepping stone to landing on the moon, they viewed “Gemini, an interim program between Mercury and Apollo, as a stepping stone” (Lambright, 2005). Robert Gilruth, of Manned Spacecraft, viewed a clear linkage among the stepping stones: “Project Gemini is in the design and construction phase. It has been planned to utilize the lessons learned in Mercury and to provide significant increases over Mercury in space flight duration and maneuverability. Gemini will provide flight experience and technical knowledge that will be applied to Apollo” (Gilruth,

1962). Richard Underwood, chief of photography, said, “[Gemini] VI and VII would be the rendezvous with two spacecraft out there, and that would have to be done if we were going to the Moon later on. Everything was stepping stones to the Moon, going on up there” (NASA, 2000b). Underwood’s quote clarifies that all organizational actions involved establishing a pathway to the moon. Similarly, astronaut Thomas Stafford noted, “The Gemini VI spacecraft was launched on the third attempt to perform the rendezvous and performed it flawlessly. After the hard work and effort of over a year, we finally achieved the key step that will lead us to the lunar-landing mission” (Cortright, 1968). Eugene Kranz, director of Mission Operations, also lauded the role of Gemini as a key stepping stone: “Gemini’s job was to develop, test, and prove the technologies we needed to go to the moon. It was the essential stepping stone. It was the keystone of the Apollo program” (PBS, 2000b). In this way, NASA employees threaded together the three stepping stones in sequence to illuminate a path to the moon.

As NASA segued to Apollo, there were no more major programs between everyday work and the objective of landing on the moon. Thus employees turned to the aforementioned A–F milestones to construct stepping stones that would connect their day-to-day work with the moon landing. Astronaut Pete Conrad inferred that he could “stay on Slayton’s crew rotation and keep flying . . . have a shot at one of the rendezvous and docking missions. . . . And then it would be on to the moon” (Chaiken, 2007). Similarly, Joseph Shea, manager of the Apollo Program, referred to an event as “one of the major milestones in the Apollo program” that “brings us just that much closer to making the manned lunar mission a reality” (NASA, 1964b).

Subjective cause: How Kennedy acted as an architect to help employees construct stepping stones. Employees mentioned the milestones generated by Kennedy and Owen Maynard when they referred to stepping stones, thereby explicating their beliefs about the cause of their ability to stitch together steps across time. Employees based the Mercury–Gemini–Apollo stepping stones on Kennedy’s introduction of these three programs. Likewise, employees based the A–F stepping stones on Owen Maynard’s decision to imitate Kennedy’s focus on only a handful of milestones by publicly posting his six stepping stones once the Apollo Program began (Chaiken, 2007).

Subjective consequence: Increased meaningfulness. Employees perceived that contributing to the objective’s realization through stepping stones boosted meaningfulness. For instance, an unidentified administrator said the following about the Mercury Program:

An item-by-item listing of all the things Mercury-Redstone 3 proved would fill a small library. That hard-won data, however, must stand the test of time and later flights. Each item becomes a dot on a scientific-engineering knowledge curve. Each flight adds significantly, if not historically, to man’s understanding of the strange environment of space. (NASA, 1961a)

Describing the occasion as a “dot on the scientific-engineering knowledge curve” conjures a complete and bounded timeline on which Mercury was just one key stepping stone of several. In this way, the administrator took a holistic view, forward and backward, to appreciate how the meaningfulness of the Mercury missions came largely from how they contributed to future missions,

wherein the words “significantly” and “historically” both indicate a sense of meaningfulness. Accordingly, NASA employees perceived that their ongoing work was meaningful because it was linked to future events through a small string of connections. As astronaut John Glenn said when discussing Mercury’s role in positioning NASA to go to the moon:

These past stepping stones have contributed to our present status and how we should proceed in the future. We have learned a lot about space flight in the past year, and I am naturally proud to have been a part of it. All of these events, however, are best used, not as separate accomplishments for the whole Mercury team, but to provide a means for revealing the direction we should follow in the future. (NASA, 1963)

Glenn’s saying that he is “proud” signals that his experience of meaningfulness is gleaned from his understanding that NASA’s ongoing achievements are connected to the pursuit of the moon.

Stage 3: Clarity of individual contribution. Although stepping stones clarified how the ongoing work of all of NASA was linked to the objective, each employee had to engage in individual connection-building to sense how his or her own work was contributing to the objective’s realization, making his or her understanding of the connection between day-to-day work and the objective more personal. This occurred when individuals perceived that they were part of a broader system of interconnections in which their work added unique value above and beyond the work of others.

As a first step toward building a personal connection, employees sensed that they and their colleagues were all oriented toward a common goal. Whereas I found no instances of phrases such as “single goal” and “common goal” before the spring of 1961, such terms became widespread afterwards. As Marlowe Cassetti, chief of guidance, said, “It wasn’t always smooth, but it was like, ‘We’ve got a common goal.’ There might be redundancy and waste and other things going on, but there was still that single purpose that I don’t imagine—maybe in the Manhattan Project there may have been that same sort of thing” (NASA, 1998b). Larry Davis, director of flight operations, explained that the perception of a common goal at NASA was unique to the lead up to the moon: “‘I’m going to get a degree. I’m going to get group lead. I’m going to get another degree.’ Very, very competitive, very oriented towards that. There was none of that going on in the Gemini–Apollo era. We were focused on this joint goal, and careers would take care of themselves . . . that kind of changed in the seventies” (NASA, 2007).

Individuals then pieced together how various employees worked on different activities in parallel to fulfill this common objective—even if different people’s work seemed, on the surface, to be unrelated. In contrast to stepping stones, in which employees strung together connections that were sequential (the vertically aligned boxes in figure 2, Stage 2), this form of connection-building involved understanding connections that were simultaneous, such that at least two distinct specializations pooled their efforts at the same time (the horizontally aligned boxes in figure 2, Stage 3). For example, astronaut Michael Collins declared that NASA’s aspiration to land on the moon was a function of “the

intelligence of its scientists, the dedication of its engineers, the careful craftsmanship of its workers" (Collins, 1969), and Neil Armstrong said that "it took 400,000 people . . . thousands of the world's best engineers, scientists, researchers, support staff, and even seamstresses who carefully stitched together the space suits required to withstand extreme temperatures" (Gallo, 2012).

On some occasions, employees viewed the pieces fitting together from a high level and spoke from a third-person perspective. Robert Carlton, of Guidance and Control, said, "I believe that was one instance in our nation when the whole complex of industry and government were working together toward a common national goal. . . . Through the whole team there was a sense of pride in what we're doing, had nothing to do with the money they made" (NASA, 2001b). Carlton referred to multiple actors as "working together," suggesting that a common goal boosts coordination and collective enthusiasm.

In addition to benefiting the collective as a whole, I found that a common goal helped individuals see their work in a different light—namely, how their everyday work was making an essential contribution to the organizational system. Each recognized that his or her work was connected to the organization's objective because he or she worked in parallel with others. To reflect this, individuals not only commented on cooperation between subspecialties at a high level but also spoke from a first-person point of view by indicating that they had a clear sense of "my job," "my role," or "my part." William Muehlberger (a geologist) noted that "you had the top scientists and engineers all with one goal. . . . As I saw my job, it was the engineering of the science" (NASA, 1999). Muehlberger talked about how multiple parties oriented toward "one goal" and saw his role as embedded within that effort. In this respect, he drew on the existence of a common goal not simply to gain clarity on the organization's overriding objective but to gain a better sense of how his own individual work connected to it.

Harold Miller, in the simulation group, used a similar first-person perspective when he likened his role to one "piece" in a giant "puzzle": "The Apollo missions were like a giant jigsaw puzzle where every piece, no matter how small or large, had its place. My role in the puzzle, although small, was a necessary activity" (Miller, 2013). His use of the "puzzle" metaphor distinguishes this form of connection-building from stepping stones because he refers to parallel pathways aligning, such that each person contributed to NASA's goal. In a similar way, Charles Harris (a systems engineer) saw a link between his everyday work and the moon via aggregate effort toward a common goal: "I worked as a systems engineer. . . . Working on the [lunar module] was exciting and rewarding. . . . There was a great pride among all of us and we all worked together as a team regardless of what company we worked for. It was a . . . national goal; I was very lucky to be part of it" (Air Space Mag, 2009). Employees continually observed that since everyone's work pointed toward a common goal, they could deduce how they were personally contributing to its realization.

Subjective cause: How Kennedy acted as an architect to help employees understand their contribution to the objective. NASA employees understood that multiple constituencies aggregated their effort toward a common goal because Kennedy reduced the number of ultimate aspirations from three to one, which in turn set the stage for him to unite all of NASA around a single objective. Charles Harris, quoted above, ascribed the united effort as being

driven by a single “national goal,” while Kenneth Kleinknecht noted that multiple functions “can be unified toward a common end with unparalleled cooperation” (NASA, 1963). Additionally, employees saw the stepping stones as the central nodes in the web of interconnections that represented the aggregate effort, as if organization-wide subgoals were the trunk of a tree and the efforts of employees in their individual roles were its branches (as depicted in figure 2, stage 3). This further crystallized people’s ability to understand how their own individual work contributed to NASA’s objective via aggregate effort. Astronaut Joseph Allen described it vividly:

These efforts are the aggregate of virtually every bit of human skill and knowledge in one way or another, all the way from knowledge of mathematics that had to do with the trajectory, to the knowledge of sewing that had to do with the putting together of the spacesuits. . . . These bits and pieces of knowledge, processes, techniques, technologies, are across the entire spectrum of the human intellect, and they were all combined . . . when it came to Mercury, Gemini, and Apollo, they are no longer an individual person’s name, because the accomplishments were an aggregate of human effort. (NASA, 2003)

Similar to Harold Miller’s metaphor about how all of the puzzle pieces fit together, Allen noted that many “bits and pieces” were aligned. Critically, he was aware that one of those pieces was his: just before he made the above observation, Allen commented on his own individual role “on some of the cosmic ray experiments as a kind of collaborative research member” (NASA, 2003). Altogether, this highlights how a common goal is useful not only because it triggers collective outcomes but because it helps individuals see a personal connection to the objective. In this way, employees used the streamlined blueprint put in place by Kennedy as a starting point from which to cognitively flesh out a complex network of connections that represented the contributions of various individuals and groups across NASA, thereby illuminating how their own work was one critical piece of many.

Subjective consequence: Increased meaningfulness. Employees felt that contributing to the objective’s realization through aggregate effort boosted meaningfulness. To illustrate, in late 1961, an unidentified NASA employee said:

Volunteers for this program will be closely screened in order that we may continue to have a top-flight team to lead us to success in our ultimate current goal. . . . Personnel of MSC can feel rightly proud of the part they are playing. While we need astronauts, engineers, and scientists, our end success will depend on the contributions of all of our people—many in supporting roles—unsung but essential. We look to ‘62 with the confidence developed by successful, productive hard work. (NASA, 1961b)

This employee talked about an aggregation of the effort of various groups toward a single-faceted mission and highlighted the work of his or her unit—the Manned Spacecraft Center—in making this goal a reality. When describing the role the MSC was playing, the employee described a feeling of pride (an affective indicator of meaningfulness) in aspiring toward this goal. This echoes the statement above by Harold Miller, who described the role he was playing as “rewarding”—an evaluative indicator of meaningfulness. Finally, this

employee implies that motivation ("hard work") was linked to this heightened sense of meaningfulness.

Stage 4: Reconstruing day-to-day work as the organization's objective. When employees did not see a connection between their day-to-day work and NASA's objective, they construed their work in terms of low-level activities. There were days when work seemed like "an exercise in switches and valves and maneuvers, rather than the first flight from the Earth" (Chaiken, 2007). This quote suggests that employees were drawing a stark demarcation between their daily work and the objective, such that their awareness of the organization's objective yielded contrast effects (i.e., they were engaged in technical activities rather than the pursuit of a groundbreaking feat). By comparison, when employees sensed that their individual work was closely tied to the objective, they began to mentally fuse together these two cognitive representations (work and the objective). They engaged in the same basic work each day, but rather than construe it as the low-level actions associated with their tasks (e.g., building electrical circuits), they described it to themselves and others as if it was the ongoing effort to put a man on the moon. Accordingly, they construed their work both in broader terms (as the organization's objective) and in more distal terms (as an event that was years away).

In some cases, employees partially reconstrued their work in terms of the objective. In doing so, their comments suggest, the effort to go to the moon dominated the way they understood their day-to-day work, but their use of the future tense depicts the objective as a future outcome instead of an ongoing process. James McLane, chief of NASA Space Environment, said, "I can remember when no matter what came along, we used to say to each other, 'We've got to get that man on the Moon,' and mean it. We really meant it, you know" (NASA, 2000a). No matter what came along, McLane and his colleagues understood that their ongoing goal was to get a man on the moon. In this way, the objective of landing on the moon was a more stable feature of work than the specifics of his day-to-day responsibilities. Similarly, flight director Gene Kranz exclaimed, "We are going to write the history books and we're going to be the team that takes an American to the moon" (NASA, 2008). By broadening his understanding of the nature of his responsibilities—from mapping coordinates to putting a man on the moon—Kranz partially reconstrued his day-to-day work as NASA's objective.

Consistent with the data above, one of the best indicators of when employees cognitively fused their work with the objective was when the objective was constantly occupying their thoughts. Lola Parker (a secretary) noted, "I don't know of anybody who was a clock puncher. No matter what role they played, that was in the back of their mind: we've got that man to get to the moon" (PBS, 1994). The preoccupation with landing on the moon, coupled with the clarity that everyday work was contributing to it, set the conditions for employees to wholly reconstrue their work in terms of NASA's objective of putting a man on the moon. A signal of this reconstrual was when they identified their work as NASA's objective of landing on the moon using the present tense. In a statement that echoes Parker's "back of their mind" comment, an unidentified male engineer talked about the lead rocket scientist, Wernher von Braun, observing that "von Braun was always thinking in the back of his head,

'we're going to the moon'" (Science Channel, 2008). Whereas an impartial observer may have described von Braun's day-to-day responsibilities as presiding over rocket development, von Braun defined his work in terms of NASA's long-term objective in the present tense.

Employees widely used the present tense to describe achieving the objective, even if it was many years away from being realized. For example, Ed Buckbee, director of the U.S. Space and Rocket Center, talked about his "passion about flying men to the moon" (PBS, 2012) when speaking of his center's work building rockets in the mid-1960s in Alabama, several years before the moon landing. Another telling example was that of Charlie Mars. As an electrical engineer, he was far removed from landing on the moon in an objective sense, yet he identified his actions as if *he* was going to the moon: "One of the things we had was a common goal; and we all realized that we were into something that was one of the few things in history that was going to stand out over the years. 'We're going to the Moon. We're putting a man on the Moon!'" (Hansen, 2009). Employees did not merely sense a direct causal connection between everyday work and NASA's objective. Rather, the objective was so cognitively omnipresent that it dominated their attention and, in turn, changed the very meaning of everyday work so that they defined it as the ongoing pursuit of the objective. The realities of space-time were subjectively compressed, and there was no perceptual distinction between what someone was doing in a given moment and the organization's objective.

Subjective cause: How Kennedy acted as an architect to help employees reconstrue their work as the objective. Kennedy's first, second, and third sensegiving steps helped employees sense a personal connection to a proximal objective, which set the stage for them to reconstrue their everyday work as the ongoing pursuit of the objective. Charlie Mars' comment above is noteworthy because it hints at the subjective causes of fusion between everyday work and the objective: his awareness that he was part of a group aggregating effort toward a common goal led him to pronounce, in the present tense, that the nature of work was the objective itself. On a related note, James Jaax said that despite working in low-status roles long before the moon landing—including as a "data runner" and an "extra 'body'" who ran errands—he felt a personal connection to NASA's core objective, and he spoke as if everyday actions represented the ongoing achievement of landing on the moon: "Being a 'data runner' was a great experience. . . . I shared . . . the overwhelming sense of accomplishment felt by my co-workers. I believed that landing on the Moon was what NASA did and was proud to be a part of it" (NASA, 2006). Jaax saw his work as "part of" the objective's realization, suggesting a correspondence between sensing a personal contribution to the objective and reconstruing work as the ongoing pursuit of that same objective ("landing on the Moon").

Another perception that led employees to reconstrue their daily work as the objective of landing on the moon was the moon's proximity. Because it was concrete and proximal (rather than abstract), NASA's core goal was salient and remained lodged in the minds of workers: "We couldn't keep the damn moon off our minds for long. All you had to do was step outside and take a look. There it was, waiting" (Deke Slayton, head of the Apollo crews; PBS, 1994). By offering the admonishment of "there it was, waiting," Slayton implied that the pure physical salience of NASA's objective led it to constantly occupy his mind.

As noted earlier, when employees said that the moon was constantly on their mind they would then reconstrue their work as landing on the moon.

Subjective consequence: Increased meaningfulness. When employees reconstrued work in terms of the objective, they perceived that their day-to-day work was more meaningful. James Jaax described both pride and “an overwhelming sense of accomplishment” from what he identified as the ongoing work of “landing on the moon.” Charlie Mars said, “‘We’re putting a man on the Moon!’ And that so captured our imagination, and our emotion” (Hansen, 2009). This suggested that reconstrual led him to experience work as more meaningful. In the next sentence, Mars indicated that a key consequence of the increased meaningfulness of work was a greater motivation to work: “We didn’t want to go home at night. We just wanted to keep going, and we couldn’t wait to get up and get back to work in the morning.”

Stage 5: Reconstruing day-to-day work as a symbol of the organization’s ultimate aspiration. Over time, employees increasingly began to construe the moon landing not in terms of the literal achievement but in terms of what it stood for. Interpreting the moon landing as a symbol, employees at NASA did not merely see it as consistent with NASA’s mission and its enduring values but as an embodiment of them. This reinstated the type of connotations that are typically associated with NASA’s ultimate aspiration of advancing science as well as even more universal ideals related to scientific achievement. Moreover, individuals perceived that these ideals were directly woven into the moon itself—a tight fusion of a concrete objective with abstract notions. To illustrate, individuals have suggested that landing on the moon “symbolized” or “represented” the following ideals: “the advancement of human achievement” (Fitch, 2004), “the triumph of American science” (Marshall, 2009), “the summit of scientific progress” (Ridley, 2007), and “one giant leap for mankind” (Armstrong, 1969). In these quotes, individuals invoked the word “science” or synonyms related to it. This suggests that they transformed the way they defined the moon, from an objective to a physical incarnation of NASA’s ultimate aspiration of advancing science. Thus meaningfulness was wrought from the end-state that the concrete event signified just as much as the impressive technical scale of the feat itself.

When the act of transforming the objective of landing on the moon to a symbol was combined with the fourth stage—reconstruing daily work as the objective of landing on the moon—the process of connection-building culminated in its ultimate form: employees reconstrued their everyday work in terms of NASA’s ultimate aspiration. When astronaut Scott Carpenter was asked in an interview to discuss orbital flight and control systems, he responded in a way suggesting that he did not construe his work in terms of these everyday actions. Instead, echoing his belief that the moon was a “high purpose” (i.e., a symbol) (Carlson, 2013), he described his work in terms of the aspiration that the moon stood for: “we . . . continue to expand our knowledge of the universe, hopefully for the benefit of all mankind” (Carpenter, 1963).

Capitalizing on the flexibility of human cognition, symbolism thus provided the final condition for individuals to feel the strongest possible connection between their day-to-day work and their organization’s ultimate aspiration, such that they perceived that they were enacting the aspiration on an ongoing basis

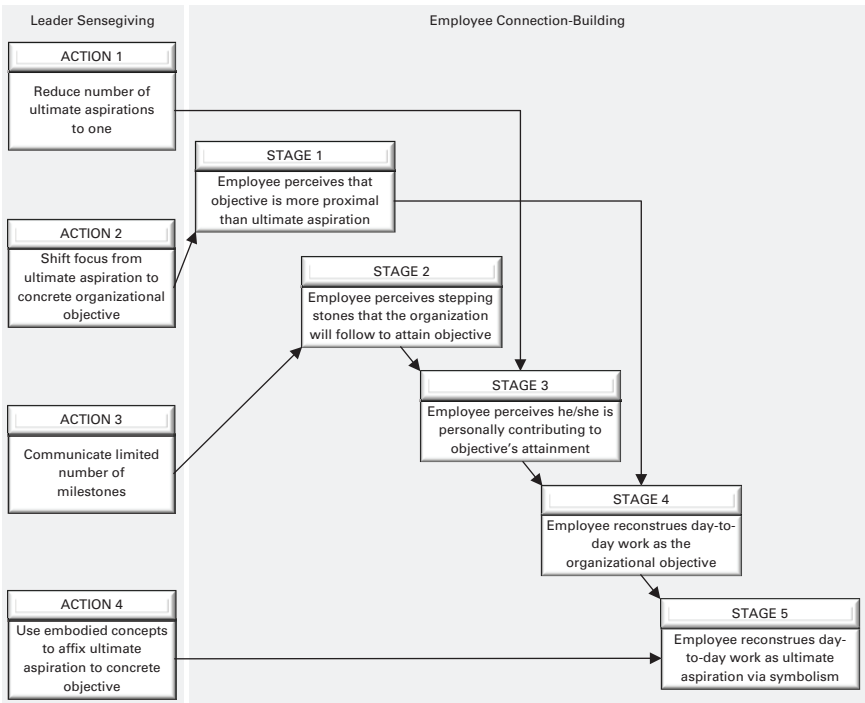
in their everyday work. In the end, daily work was not merely congruent with the organization's ultimate aspiration, it was a vessel that embodied it. Employees thereby fully absorbed the ultimate aspiration of advancing science into their conception of what they were doing each day.

Subjective causes: How Kennedy acted as an architect to help employees reconstrue their work as NASA's ultimate aspiration. Carpenter's quote above suggests that because NASA's ultimate aspiration was embodied by the objective (the moon was a "high purpose"), the act of reconstruing work as the objective of landing on the moon (the fourth connection-building stage) was a necessary precondition for employees to reconstrue their work as NASA's ultimate aspiration. In a related vein, one unidentified individual spoke in the early 1960s about "mankind's greatest aim—a trip to the moon," a statement in which a concrete construal of the moon landing ("a trip to the moon") housed an abstract construal ("mankind's greatest aim").

Additionally, the fourth leader sensegiving action—using embodied concepts to affix the ultimate aspiration to a concrete objective—served as a second subjective cause. A speech that Vice President Lyndon Johnson gave is informative. Johnson said that the push for the moon "is merely symbolic" and that NASA's primary aspiration involved "developing and applying new scientific capabilities for the betterment of life on this earth for all mankind" (Johnson, 1963). This message was closely mirrored by Carpenter's statement, just one month later, that he hoped NASA would advance science "for the benefit of all mankind." Similarly, James Webb, head of NASA and second in command behind Kennedy, said that in addition "to the moon . . . the overriding concept underlying this program is that of driving forward the advancing front of science" (NASA, 1962c). Webb's figure of speech, "driving forward the advancing front," evokes physical movement even though he follows this phrase with an abstract concept ("science"). In this way, his wording affixed NASA's ultimate aspiration to an image of forward physical movement. Following Webb's comment, Robert Seamans (an administrator) reconstrued his work at the broadest possible level, first noting that "a project serves a larger purpose than its own defined immediate ends" (NASA Technical Reports Server, 1966). While Seamans mentioned the objective of a "lunar landing in this decade" (a concrete construal), he also construed project work, in the present tense, in terms of NASA's ultimate aspiration in a way that echoed Webb's statement above: "a project provides a creative and driving force in the total achievement of science" (NASA Technical Reports Server, 1966).

Subjective consequence: Increased meaningfulness. When employees reconstrued the meaning of everyday work as a symbol of NASA's ultimate aspiration of advancing science, they were positioned to experience the greatest amount of meaningfulness. Because a symbol blends both an abstract and concrete interpretation of an event into a single cognitive representation, it accounts for the reality that individuals have a finite amount of attention (Ocasio, 1997) and thus would prefer to focus on fewer ideas at a given time. Accordingly, although a concrete event is fleeting by its very nature, a symbol preserves a key aspect of an organization's identity and its capacity to lend meaningfulness to action: the permanence of its core ideology (Collins and Porras, 1994). In other words, a symbol combines the prospect of real-world achievement necessary for employees to feel connected to the organization's real life pursuits and the enduring, timeless ideals that are designed to outlast

Figure 3. Inductive theoretical model of how leader sensegiving enables employee connection-building.*



* The arrows denote causal connections inferred by employees.

any single organizational objective. As a result, the potential for an ultimate aspiration to make everyday work meaningful is fully realized. To illustrate, Robert Gilruth spoke about the heightened meaningfulness and motivation that resulted from his understanding of the moon landing as a symbol of “the most ambitious and challenging adventure in human history.” His comments suggest that his understanding of the moon landing as the pinnacle of scientific advancement and human achievement was the origin of the “pride” (i.e., meaningfulness) and “extra effort” (i.e., motivation) exhibited by NASA employees:

People whose pride in their craftsmanship will permit no compromise of the quality essential to success . . . people who will freely give the last bit of extra effort that so often spells the difference between success and failure . . . every manned spacecraft that leaves this earth on the most ambitious and challenging adventure in human history [will] represent the best that dedicated and inspired men can create. (Gilruth, 1961)

Figure 3 integrates the four sensegiving actions and five forms of connection-building into a theoretical model that includes NASA employees’ perceptions of causality. The figure summarizes how leaders help employees see a connection between their daily work and the organization’s ultimate aspiration that is fused so tightly that the meaning of work itself changes—

from a low-level activity to the pursuit of the ultimate aspiration. As leaders proceed through the four sensegiving actions, employees progress through five distinct perceptual stages. They move from perceiving that their work is distinct from the organization's pursuit of its ultimate aspirations ("NASA is trying to advance science, but I'm just building electrical circuits") to (1) perceiving that a downstream objective is proximal even though it feels distinct from day-to-day work ("NASA is trying to put a man on the moon in just eight years, but I'm still building electrical circuits") to (2) perceiving that their work will collectively realize the objective ("we will follow these three stepping stones to the moon") to (3) perceiving that one's own work is contributing to the objective's realization ("my effort to build circuits will help put a man on the moon") to (4) perceiving that one's work is the ongoing pursuit of the organization's objective ("I'm not building electrical circuits, I'm putting a man on the moon") to (5) perceiving that one's work is the ongoing pursuit of the organization's ultimate aspiration ("I'm not building electrical circuits, I'm advancing science"). By reconstruing their everyday work at a broader level, employees perceive that an ultimate aspiration is not merely a downstream consequence of their work, but *is* their work.

DISCUSSION

My findings indicate that scholars can conceptualize leaders as architects who optimally motivate employees when they create a cognitive blueprint composed of a small and streamlined constellation of connections that link everyday work and the organization's ultimate aspirations and then allow employees to mentally assemble more elaborate connections around that core structure (Hanges, Lord, and Dickson, 2000). This positions employees to perceive that they themselves are enacting the organization's objective ("I'm putting a man on the moon") and ultimate aspiration ("I'm advancing science") in their everyday work. My findings suggest that a leader's blueprint will more effectively bolster connection-building to the extent that it adheres to a surprisingly narrow set of parameters, such as a single overarching objective and a small number of milestones. Conceptualizing leaders as architects departs from two paradigms that currently dominate the study of how leaders craft rhetoric to influence the meaningfulness employees find in their work: leaders as transformational visionaries and leaders as overseers.

Leaders as Architects versus Leaders as Transformational Visionaries

One longstanding body of research assumes that leaders enhance the motivation of their employees when they pair clear directives about day-to-day work with an inspiring portrayal of the organization's ultimate aspirations (Bennis and Nanus, 1985; Bass and Riggio, 2005). Yet ultimate aspirations are so distinct from an individual's day-to-day, circumscribed work that employees struggle to see the connection between them. As a result, even employees who find their organization's ultimate aspirations compelling will be inspired only to the extent that they see how their work connects to them. Leaders who function as architects can help employees build this connection, as they focus less on conveying the inspirational power of reaching the top of a completed structure than on

depicting the entirety of the structure all at once, from the foundation to the top level (Sitkin and Pablo, 2005; Amernic, Craig, and Tourish, 2007).

Leaders must invest more time when functioning as architects than as visionaries, because more actions are required to guide employees' connection-building than to showcase the meaningfulness of the organization's ultimate aspirations. To this point, the first three leader sensegiving actions consist of helping employees connect their work to an organizational objective rather than focus on that objective's meaningfulness. And even the fourth sensegiving action, which involves establishing the objective's meaningfulness, features connection-building in a pivotal role: if leaders use embodied concepts to connect the abstract ideals associated with an aspiration to something in the real world—a person, object, or event—then individuals are better able to grasp the abstract meaning of that aspiration because they can cognitively transform something they can easily comprehend into a living embodiment of the organization's broadest and loftiest aims. Accordingly, an ultimate aspiration appears proximal and accessible rather than far-removed and detached from one's reality. Thus leaders who serve as architects highlight the meaningfulness of ultimate aspirations indirectly: placing a concrete objective front and center and portraying it as a symbol of those aspirations.

To facilitate connection-building, leaders must enact four actions rather than just one for a surprising reason: it is necessary to impair employees' connection-building in the short term to enrich it in the long term. This can be best understood by examining the consequences of the second leader sensegiving action, shifting attention from an abstract ultimate aspiration to an organizational objective. The initial effects of this action not only fail to address the reality that ultimate aspirations appear to be disconnected from daily work but further exacerbate it, for two reasons. First, although an objective's concreteness and time-delimited scale make it appear closer to employees' day-to-day reality than an ultimate aspiration's abstractness and timelessness, shifting attention from an aspiration to an objective leads to a form of sensebreaking (Pratt, 2000): compared with an abstract aspiration, the success or failure of a concrete objective is clear and stark. Thus it is difficult for employees to see that their work plausibly connects to the objective. Second, a concrete objective lacks the abstract idealism that is associated with the organization's most ambitious aspirations: as a real-life event, it does not have the ethereal connotations (e.g., "change the world") that characterize the classic conceptualization of a higher purpose (Sparks and Schenk, 2001) and convey the gravitas that employees expect from an overarching purpose. In short, employees not only feel that their daily work is just as disconnected from an organizational objective as it is from an ultimate aspiration but that an objective is also less meaningful than an ultimate aspiration.

Despite the fallout from focusing employees on an organizational objective, this action is essential because it sets the stage for leaders to help employees reframe how they understand their everyday work, from low-level tasks ("I'm fixing wiring") to the organization's ultimate aspirations ("I'm advancing science"). The most appropriate way to understand this reframing process is via construal level theory (Trope and Liberman, 2010), which posits that individuals can construe the same action (e.g., reading) at any level of a goal hierarchy, ranging from concrete, short-term goals (e.g., following lines of print) to broad, timeless aspirations (e.g., gaining knowledge) (Liberman and Trope, 1998)—in

the same sense that one bricklayer may identify his work as laying bricks while another may describe it as constructing a cathedral (Simon, 1964).

An organizational objective allows employees to experience two distinct yet complementary forms of reconstrual. First, the objective's concreteness helps employees see that their own work is contributing to a real-life outcome, which in turn allows them to reconstrue their work in terms of this outcome. Leaders can even help employees reconstrue their work as an objective that is extremely distal as long as it is concrete and will one day be attained. Indeed, one NASA employee proclaimed "we're going to the moon" in the mid-1960s even though the landing was not planned to take place for several years and he would not be going. Notably, the construal of day-to-day work as "going to the moon" was not limited to astronauts and engineers but extended to employees at all levels—including secretaries and interns. This reality echoes a legend in which Kennedy, touring NASA headquarters, encountered a custodian mopping the floors. Kennedy asked the employee, "Why are you working so late?" The custodian responded, "Because I'm not mopping the floors, I'm putting a man on the moon."

Second, because an organization-wide objective requires the entire workforce to pool its efforts to achieve it, it has a sense of scope that makes it grand enough for leaders to cast it as a symbol of the organization's ultimate aspiration. This benefit is magnified when the objective is difficult and set on a multiyear time horizon. For instance, landing on the moon was challenging enough to embody the ideal of "advancing science" and long enough in duration for an employee such as Annie Easley to perceive that her efforts in the 1960s were "my life's career" (NASA, 2001c).

These two forms of reconstrual are subtly distinct: the first involves rescripting a concrete action (a task) as a concrete event (the organization's objective), whereas the second involves rescripting a concrete event as an abstract aspiration that the event invokes. Yet both forms of reconstrual involve reframing an action or event more broadly—the first involves reconstruing individual work as an organizational objective, and the second involves reconstruing an organizational objective as an abstract theme. For this reason, the two forms of reconstrual can be combined synergistically, such that employees construe their everyday work as the organization's most far-reaching aspirations ("I'm advancing science") and thus perceive that the meaningfulness of the organization's enduring pursuits is manifest in daily activity. When considering these ideas together, one key implication is that the second sensegiving step—despite impairing connection-building in the short-term—provides the platform for individuals to build on the three other sensegiving actions to frame their work in the grandest terms possible, because an organizational objective is sufficiently proximal for employees to connect their work to it, yet sufficiently ambitious to credibly "stand in" for (and invoke) the grandness of an ultimate aspiration. This sets the stage for theory on leadership and construal level theory to be more fully integrated, as scholars have not yet uncovered the specific tactics leaders can use to influence followers to construe their work in grander terms.

Because this process of redefining work in broader terms increases the meaningfulness of work, a key takeaway from my inductive analysis is that leaders enhance the meaningfulness of work by changing the meaning of work. This insight builds on the idea that meaning is pliable, such that most actions have multiple meanings and people can focus more on one particular

meaning than another (Baumeister, 1991; Wrzesniewski et al., 1997). Consequently, the concepts of meaning and meaningfulness are not only distinct from one another (Pratt and Ashforth, 2003; Rosso, Dekas, and Wrzesniewski, 2010) but are also not automatically complementary: if leaders do not provide employees with the conditions for connection-building, and in turn ensure that the most meaningful organizational aspirations change the meaning of everyday work, then employees will not move from recognizing the meaningfulness of an ultimate aspiration to personally gaining meaningfulness from an ultimate aspiration. To adopt the parlance of theory on transformational leadership (Bass and Avolio, 1994), although leaders must couple a transformational aspiration with the transactional supervision of daily tasks, it is just as important—and perhaps more challenging—to engage in translational leadership by helping employees translate the meaning of their work from low-level actions to high-level aspirations.

Leaders as Architects versus Leaders as Overseers

A conceptualization of leaders as architects is also distinct from perspectives that depict leaders as responsible for directly shaping employee perceptions on a day-to-day basis. One key example of this is the way NASA leaders set intermediate goals that stretch between everyday work and long-term objectives. Although perspectives on strategy, planning, small wins, management-by-objectives, and goal setting do not often explicitly prescribe a specific number of subgoals, these perspectives emphasize that subgoals are useful because they help employees focus attention, track progress, and regulate effort (Chesney and Locke, 1991; Amabile and Kramer, 2011; Stam et al., 2014). As such, it would follow that leaders can boost motivation by breaking down large-scale missions into as many incremental subgoals as possible, such that more is better. My findings highlight how leaders can use subgoals in the opposite way: rather than direct people's attention to thin and incremental slices of activity in piecemeal fashion, leaders can use subgoals to highlight only a select few critical junctures that stretch between work and a long-term objective, thereby helping employees mentally condense the vast expanse of time and the thousands of activities that stretch between day-to-day work and the objective. This helps employees keep in mind both daily work and the organization's long-term objective at the same time. As a result, employees adopt a holistic view of the passage of time and sense that their work and the organization's objective occupy opposite ends of a single passageway. And while the existence of only a few subgoals provides the simplicity necessary to keep people's attention focused on this work-objective connection, a small number of subgoals is sufficient to make the objective's achievement seem plausible. This combination of simplicity and plausibility enables employees to quickly intuit a connection between work and the objective, positioning them to redefine their work as the objective.²

² Although future empirical research is needed to pinpoint the optimal number of subgoals, the actions of NASA leaders may provide useful clues. John F. Kennedy and Owen Maynard communicated three and six milestones, respectively. These two numbers are in concert with the reality that people prefer to keep no more than seven discrete bits of information in mind at a given time (Miller, 1956).

Thus scholars should account for tradeoffs between the received wisdom that leaders can help employees regulate their behavior toward a long-term objective through a large number of subgoals with my finding that leaders help employees perceive a stronger connection to a long-term objective via a small number of subgoals. Whereas a small number of subgoals illuminates the pathway to the objective, a large number can inadvertently obscure it—even if it helps employees pace themselves. For example, Neil Armstrong stated that his awareness of “thousands of little incremental steps” made him lose sight of NASA’s objective of landing on the moon. Given that the motivational benefits of individual subgoals can wear off over time (Welsh and Ordóñez, 2014), whereas the motivational benefits of a meaningful end goal are likely to be lasting, a small number of subgoals may have more enduring benefits for motivation because the objective will remain front and center in employees’ minds and thus provide a constant source of inspiration. In this way, the leader-as-architect paradigm is distinct from one that considers leaders to be overseers who proximally shape employees’ experiences (House and Mitchell, 1974; Foldy, Goldman, and Ospina, 2008). Rather than map out day-to-day work in minute detail, architects conjure a simplified blueprint composed of only a few basic connections.

As another way to understand how leaders do not act as overseers, but rather serve as architects who provide a structural blueprint that shapes employee connection-building from afar, it is useful to consider the role of employee agency. Rather than assume that leader influence and employee agency are antithetical, such that stronger direction from leaders equates to less follower autonomy (Hackman, 1987), the leader-as-architect paradigm assumes that leader and employee agency are complementary. Leaders take an active role early on by conveying “enabling conditions” (Sitkin and Pablo, 2005) and then provide employees the time and space to piece together how their work is tied to the organization’s goals. Reinforcing this point, Kennedy enacted his four sensegiving actions within a two-year time span (1961–1962), whereas employees engaged in the connection-building process over more than eight years. Thus, although the leader-as-architect model invokes classic theories on leadership and hierarchy by assuming that influence is largely unidirectional (from leaders to followers), it departs from the leader-as-overseer model by acknowledging that employees proactively build connections away from their leaders’ immediate oversight.

This view can provide a new vantage point on a number of well-studied leader actions. Perhaps the best example involves as-yet-unidentified consequences of communicating a common goal. Scholars have suggested that a common goal triggers social contagion by causing people to band together (Carson, Tesluk, and Marrone, 2007) and increases coordination by providing a shared point of reference (Carton, Murphy, and Clark, 2014). Although I did find evidence for these group-level benefits, my findings also suggest that an individual-level mechanism is at work: a common goal helps each employee realize that he or she is making an important individual contribution to a system that stretches well beyond his or her own personal ends. When employees sense that each of their colleagues is working toward the same objective, they are better able to comprehend the many activities that different members undertake in parallel. In turn, they can locate their own job within the larger system and see why it is essential (Hu and Liden, 2011). In this way, getting a

sense of the interconnections that make up the whole enables one to sense his or her part within it. Although prior research has explored the parallel role of individual and collective processes (Hu and Liden, 2011; Stam et al., 2014), this formulation suggests that leaders' actions that are ostensibly engineered to galvanize a collective also have instrumental consequences for individuals once they have the requisite time to put the pieces of the puzzle together and identify how their own piece fits within it. Thus a common goal may have invaluable benefits for employees even in organizations with individualistic cultures, in which the traditional benefits of a common goal (e.g., collective cohesion) are less valued.

At NASA, employees constantly traced their ability to recognize their individual role to the existence of a single objective, suggesting that there may be a categorical distinction between having a single goal versus more than one. Even the presence of two organizational objectives can be problematic. Because all organizational objectives require the aggregate effort of many people, individuals will be less likely to infer that their own work is combining with the work of others to achieve any given objective when multiple objectives exist at once, simply because they will observe some of their colleagues working toward different objectives. In contrast, a single objective helps each individual engage in mental disassembly and assembly to understand how his or her work fits within an otherwise immense system. Leaders thus act as architects by setting a highly particularized enabling condition (constricting attention to a single end-point), and employees act as builders who do the heavy lifting by constructing a complex lattice-work of connections between their own work, the work of other employees, and the organization's goals, ultimately gaining a sense of their unique personal contribution to the organization. This reinforces the idea that leaders optimally inspire employees when they communicate a simple architectural schematic composed of only the core connections between everyday work and the organization's timeless aspirations.

Transferability and Directions for Future Research

Although an extreme case is useful for uncovering new insights (Eisenhardt, 1989), it requires a consideration of how findings translate to other contexts (Lincoln and Guba, 1985). Kennedy had the advantage of leading a young organization that was working through the nascent stages of identity construction and a rival (the Soviet Union) that helped galvanize collective energy. This suggests that it may be easier for leaders to narrow attention to a single end if they have the latitude to shape the organization's identity and can draw attention to salient competitors. NASA's leaders also had a built-in advantage when constructing milestones because landing on the moon required traversing an actual physical distance (e.g., reaching Earth's orbit, breaking Earth's orbit, reaching lunar orbit). Future research can examine whether certain organizational contexts lend themselves better to crafting similar visual-spatial milestones, such as fundraising organizations that use thermometer cutouts to mark progress toward a target fundraising goal.

Finally, the moon naturally lends itself to be cast as a symbol because it not only has the potential to be a beacon-like "higher purpose," in a figurative sense, but is a bright beacon that resides "high" in the sky in a literal sense. Toward this end, it may be useful for future scholars to account for whether it

is easier for leaders to transform a concrete objective into a symbol in certain organizational contexts, such as those in which objectives are especially easy to visualize (e.g., organizations, such as Boeing, that build airplanes) and those in which leaders can embody profound concepts by personifying them in single individuals (e.g., hospitals in which one patient serves as a symbol of health and healing) (Grant, 2012). In this fashion, future scholars can track whether certain organizations provide leaders with conditions that are favorable for helping employees change the meaning of work and, in turn, enhance the meaningfulness of work.

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