BEYOND CHEERLEADERS AND CHECKLISTS: THE EFFECTS OF THE FEEDBACK ENVIRONMENT ON EMPLOYEE SELF-DEVELOPMENT

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BEYOND CHEERLEADERS AND CHECKLISTS: THE EFFECTS OF THE FEEDBACK ENVIRONMENT ON EMPLOYEE SELF-DEVELOPMENT

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ABSTRACT

Researchers and practitioners have a shared interest in understanding how to encourage employees to seek out and take opportunities to better themselves. A great deal of extant research has explored the effectiveness of and participation in formal development programs. To that end, previous work has focused on understanding the personal and contextual variables that facilitate interest and motivation in self-development, giving special emphasis to the supportive role supervisors can play by encouraging employees and publicizing opportunities for voluntary development. Consistently, researchers have concluded that participation is influenced directly or indirectly by perceptions that development is needed, and that employees who have firm career goals are more likely to participate.

Feedback is one tool supervisors can use to share information critical to effective goal setting and development decision making. The feedback environment provided by supervisors has been tied to positive organizational outcomes that benefit both employee behavior and well-being on the job. Although feedback has been examined extensively in the context of performance management, the value of the feedback environment as a catalyst for self-development has been relatively ignored.

The present study examined this relationship and hypothesized the ways in which the supervisor feedback environment relates to self-development. A sample of over 400
respondents to an online survey was used to investigate the questions presented in the present study. Ultimately, results suggest that the supervisor feedback environment meaningfully relates to career insight and to self-development, and that employee’s own tendency to seek, appreciate, and use feedback also plays a role in determining whether the supervisor feedback environment and self-development are tied together.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>ix</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF FIGURES</td>
<td>xii</td>
</tr>
<tr>
<td><strong>CHAPTER</strong></td>
<td></td>
</tr>
<tr>
<td>I. STATEMENT OF THE PROBLEM</td>
<td>1</td>
</tr>
<tr>
<td>Self-Development</td>
<td>2</td>
</tr>
<tr>
<td>The Feedback Environment</td>
<td>3</td>
</tr>
<tr>
<td>Individual Differences</td>
<td>6</td>
</tr>
<tr>
<td>The Present Study</td>
<td>7</td>
</tr>
<tr>
<td>II. LITERATURE REVIEW</td>
<td>10</td>
</tr>
<tr>
<td>Employee Development</td>
<td>12</td>
</tr>
<tr>
<td>The Role of the Organization in Self-Development</td>
<td>32</td>
</tr>
<tr>
<td>Career Insight and Perceived Need for Development</td>
<td>44</td>
</tr>
<tr>
<td>The Role of Individual Differences in the Feedback Environment-Self-Development Relationship</td>
<td>52</td>
</tr>
<tr>
<td>The Conditionality and Coexistence of Indirect Effects</td>
<td>65</td>
</tr>
<tr>
<td>III. METHODOLOGY</td>
<td>69</td>
</tr>
<tr>
<td>Participants</td>
<td>69</td>
</tr>
</tbody>
</table>

vii
LIST OF TABLES

Table | Page  
--- | ---  
3.1 | Measures and measurement sources in the present study..................80  
4.1 | Means, standard deviations, and correlations of variables in the present study ....82  
4.2 | Model coefficients for the indirect effect of supervisor feedback environment on self-development through career insight (Hypothesis 3).................................87  
4.3 | Model coefficients for the indirect effect of supervisor feedback environment on self-development through need for development (Hypothesis 5).........................89  
4.4 | Model coefficients for the indirect effect of supervisor feedback environment on career insight through feedback seeking (Hypothesis 6)....................................91  
4.5 | Model coefficients for the indirect effect of supervisor feedback environment on need for development through feedback seeking (Hypothesis 7)..........................94  
4.6 | Regression results for the moderation of the effect of supervisor feedback environment on feedback seeking by feedback orientation (Hypothesis 8).........97  
4.7 | Regression results for the moderation of the effect of supervisor feedback environment on career insight by feedback orientation (Hypothesis 9)...............98  
4.8 | Results from a regression analysis examining the moderation of the effect of supervisor feedback environment on need for development by feedback orientation (Hypothesis 10)..........................99  
4.9 | Results from a regression analysis examining the moderation of the effect of career insight on self-development by feedback orientation (Hypothesis 11)....103  
4.10 | Results from a regression analysis examining the moderation of the effect of need for development on self-development by feedback orientation (Hypothesis 12).........................................................................106
4.11 Results from a regression analysis examining the moderation of the effect of need for development on self-development by self-directed protean career attitude (Hypothesis 14) .........................................................................................................................................107

4.12 Summary of hypotheses and results ..........................................................................................................................................................................................110

4.13 Model coefficients for the indirect effect of supervisor feedback environment on self-development through career insight and need for development, modeled as parallel mediators (Research Question 1) ........................................................................................................................................114

4.14 Indirect effects of supervisor feedback environment on self-development through parallel mediators, and paired contrasts of the differences corresponding to Figure 4.12 ........................................................................................................................................115

4.15 Path analytic results from serial mediation model estimated for Research Question 1 ...............................................................................................................................................................................118

4.16 Indirect effects of supervisor feedback environment on self-development and paired contrasts between mediated paths estimated for serial mediation model including career insight (Figure 4.14) ........................................................................................................................................118

4.17 Path analysis results from serial multiple mediator model depicted in Figure 4.15 ...............................................................................................................................................................................121

4.18 Indirect effects of supervisor feedback environment on self-development and paired comparisons between the indirect pathways for the serial mediation model including need for development (Figure 4.15) ........................................................................................................................................121

4.19 Path analytic results from analysis of the conditional indirect effect of supervisor feedback environment on self-development through 2 parallel mediators with feedback orientation as an a path moderator (Research Question 2) ........................................................................................................................................127

4.20 Indirect Effects of Supervisor Feedback Environment on Self-Development through mediators at specific levels of feedback orientation corresponding to Figure 4.16 ...............................................................................................................................................................................127

4.21 Path analytic results from conditional indirect effect of supervisor feedback environment on self-development with feedback orientation as a b path moderator (Research Question 2) ........................................................................................................................................131

4.22 Indirect Effects of Supervisor Feedback Environment on Self-Development at specific levels of Feedback Orientation as a b path Moderator ........................................................................................................................................131
4.23 Path analytic results for the conditional indirect effects of supervisor feedback environment on self-development, through career insight and need for development, with feedback orientation as a moderator of both $a$ and $b$ paths .................................................................................................................. 135

4.24 Inference for the conditional indirect effect of supervisor feedback environment on self-development through career insight and need for development ............................................................................................................. 137

4.25 Summary of analyses, tables, and figures corresponding to each research question .................................................................................................................................................. 139
LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Hypothesized relationships in the present study</td>
<td>9</td>
</tr>
<tr>
<td>2.1</td>
<td>Hypothesized relationships in Maurer &amp; Tarulli (1994)</td>
<td>19</td>
</tr>
<tr>
<td>2.2</td>
<td>Maurer et al. (2003) results</td>
<td>24</td>
</tr>
<tr>
<td>4.1</td>
<td>Hayes (2013) PROCESS mediation Model 4 template used for Hypotheses 3, 5, 6, and 7</td>
<td>86</td>
</tr>
<tr>
<td>4.2</td>
<td>Summary of simple mediation analysis results for Hypothesis 3</td>
<td>88</td>
</tr>
<tr>
<td>4.3</td>
<td>Summary of simple mediation analysis results for Hypothesis 5</td>
<td>90</td>
</tr>
<tr>
<td>4.4</td>
<td>Summary of simple mediation analysis results for Hypothesis 6</td>
<td>92</td>
</tr>
<tr>
<td>4.5</td>
<td>Summary of simple mediation analysis results for Hypothesis 7</td>
<td>94</td>
</tr>
<tr>
<td>4.6</td>
<td>Hayes (2013) PROCESS Moderation Model 1 conceptual and statistical template</td>
<td>96</td>
</tr>
<tr>
<td>4.7</td>
<td>The conditional effect of supervisor feedback environment on need for development as a function of feedback orientation (Hypothesis 10)</td>
<td>101</td>
</tr>
<tr>
<td>4.8</td>
<td>The relationship between supervisor feedback environment and need for development at the 10th, 25th, 50th, 75th, and 90th percentiles of feedback orientation (Hypothesis 10)</td>
<td>102</td>
</tr>
<tr>
<td>4.9</td>
<td>The conditional effect of career insight on self-development as a function of feedback orientation (Hypothesis 11)</td>
<td>104</td>
</tr>
<tr>
<td>4.10</td>
<td>The career insight-self-development relationship at the 10th, 25th, 50th, 75th, and 90th percentiles of feedback orientation (Hypothesis 11)</td>
<td>105</td>
</tr>
<tr>
<td>4.11</td>
<td>Hayes (2013) Model 4 template with multiple parallel mediators</td>
<td>113</td>
</tr>
</tbody>
</table>
4.12 Statistical results for the parallel mediator model........................................114
4.13 Hayes (2013) multiple mediator Model 6 template ......................................116
4.14 Results from serial multiple mediator analysis for Research Question 1 ..........117
4.15 Results from a serial multiple mediator analysis for Research Question 1 .......120
4.16 Conceptual and statistical depictions of PROCESS Model 7 template (Hayes, 2013) for Research Question 2 reflecting feedback orientation as an $a$ path moderator of the indirect effect of supervisor feedback environment on self-development through career insight and need for development. .........................126
4.17 Conceptual and statistical depictions of PROCESS Model 14 template (Hayes, 2013) for Research Question 2 reflecting feedback orientation as a $b$ path moderator of the indirect effect of supervisor feedback environment on self-development through career insight and need for development .....................130
4.18 Conceptual and statistical depictions of Hayes (2013) parallel mediator model, with both $a$ and $b$ paths moderated, as applied to the present study .......................134
CHAPTER I

STATEMENT OF THE PROBLEM

Performance management in organizations has evolved from the practice of rating employee performance once a year to a more comprehensive, continuous process of measuring and developing individual performance in an effort to support employees’ abilities to grow with the needs of their employing organization (Aguinis, 2013; Aguinis, 2009; O’Malley & Gregory, 2011). Research and practice have emphasized the importance of communication between supervisors and their employees to target performance improvement, resulting in an increased interest in understanding and measuring the influence of the social context around feedback conversations, also called the feedback environment (Ilgen, Fisher, & Taylor, 1979; Levy & Williams, 2004; London & Smither, 2002; Steelman, Levy, & Snell, 2004). Although this research has affected theory and practice for managing performance on the job, less attention has been paid to the role that the social context plays in other, more distal performance management practices, including employee development.

The employee development literature has focused extensively on technical updating, the role of organizational support, and individual differences that foster interest and participation in development initiatives that include formal training, high-potential
and leader development, apprenticeship programs, and mentoring (e.g., Hurtz & Williams, 2009; Kraimer, Seibert, Wayne, Liden, & Bravo, 2011; McCauley & Hezlett, 2002; Noe & Wilk, 1993). However, as the demand for adaptive, self-directed employees rose during the start of the 21st century, interest in employee driven development, or self-development, has increased.

**Self-Development**

The term *self-development* refers to voluntary activity taken by employees to gain job knowledge, skills, or abilities (Orvis & Leffler, 2011). While inherently driven by and beneficial to individuals, organizations are increasingly interested in supporting employee self-development as a way to improve the quality of the workforce in the face of constantly changing environmental demands. Self-development has increasingly become a common component of broader development initiatives associated with performance and talent management in organizations, as employers see added benefit from having a highly trained and developed workforce without having to make the same heavy investments in training and formal development opportunities.

Extant self-development research has examined individual differences and organizational elements that influence participation in self-driven developmental activities (e.g., London, Larsen, & Thisted, 1999; Maurer & Tarulli, 1994; Orvis & Leffler, 2011). Research has demonstrated that perceiving a need for development, or believing there are benefits to be gained by participating in development, is associated with interest in future opportunities. Employees who have a strong understanding of the demands of their career goals are also more likely to value and participate in development. These authors have also noted the importance of supportive policies,
supervisors, and insightful, motivated employees for self-development participation. Fostering positive attitudes about development, implementing policies that support employees who seek developmental opportunities, and encouraging supervisors to advertise and support development are all forms of organizational support linked to participation in development.

However, investigations of the social context surrounding development have been confined to the consideration of supportive organizational policies, supervisors, and coworkers. Although the role of the social context in other performance management processes has been widely researched, the study of contextual factors affecting self-development has focused more exclusively on perceptions of support, ignoring factors of the social context that may operate via information sharing to affect participation in self-development. In particular, researchers have not thoroughly investigated the role of feedback exchanges between supervisors and their employees that may be the proximal trigger to employee-initiated development activity, while researchers have invested a great deal of energy into investigating how these feedback exchanges influence task performance. The present study extends the performance management research to include a development outcome valued in practice, and fills this gap in the literature by proposing several theoretically and empirically based mechanisms through which the social context of feedback could affect self-development (Figure 1.1).

**The Feedback Environment**

London & Smither (2002) proposed that a strong *feedback culture*, a contextual quality characterized by continuous receipt, solicitation, and use of feedback both formally and informally, should be linked to effective performance management,
continuous learning, and career development for employees. When the feedback culture is strong and thus supportive of the feedback exchange process, London and Smither anticipated benefits including better performance, increased self-awareness and self-confidence, and behavior change.

At the interpersonal level, the availability of feedback in the work environment, or the feedback environment, has been linked to many favorable psychological states and outcomes within the performance appraisal process (e.g., Anseel & Lievens, 2007; London & Smither, 2002; Norris-Watts & Levy, 2004; Whitaker, Dahling, & Levy, 2007). Specifically, research has demonstrated that favorable feedback environments are associated with employees reporting greater perceptions of control over information and decisions that affect them on the job (Sparr & Sonnentag, 2008), greater feedback seeking and role clarity (Whitaker et al., 2007), and decreased perceptions of political influence in the work environment (Rosen, Levy, & Hall, 2006). Although extant work seems to support the suggestion that a favorable feedback environment would likely benefit employees by providing the information necessary to successfully manage self-development, a paucity of research linking the feedback environment to participation in employee development makes the proposition merely theoretical.

As employee self-development becomes more important to employees and increasingly becomes a part of organizational talent management strategies, organizations will benefit from understanding how to strategically influence and support self-development. Feedback, at its core, is information that can direct behavior (Ilgen et al., 1979). A favorable feedback environment has been shown to positively affect employee feedback seeking (Whitaker et al., 2007), and feedback seeking is one tactic employees
can use to proactively gain information from their supervisors about their capabilities and deficiencies. Insight into one’s skills and abilities, as well as the demands of future career opportunities, is critical to making self-directed developmental decisions. Thus, a favorable supervisor feedback environment likely influences the extent to which employees gain the insight necessary to self-direct development in part because it promotes employee feedback seeking.

Additionally, it is plausible that a favorable feedback environment directly affects the extent to which employees are aware of the demands of future job opportunities and of any developmental needs, as positive and negative feedback are more available, credible, and thoughtfully delivered in a favorable feedback environment. The current study expands the research on the feedback environment by investigating the effect of a favorable supervisor feedback environment on employees’ self-development, via increased feedback seeking, awareness of developmental needs, and career insight.

When supervisors provide quality positive and negative feedback that is credible, available, and delivered in a thoughtful manner, employees are more likely to seek feedback (Whitaker et al., 2007). Additionally, increased feedback availability is expected to increase the chance that employees perceive the need to develop knowledge, skills, or abilities in order to pursue their career goals. Having knowledge of the demands of future career goals, or the perception that certain skills or abilities are in need of development, have both been tied to participation self-development (Maurer & Tarulli, 1994; Maurer, Weiss, & Barbeite, 2003). However, the present study would be the first to directly link a favorable supervisor feedback environment to these employee perceptions, and to self-development behavior.
Individual Differences

Acknowledging that individual characteristics and the environment often interactively affect employee development (e.g., London & Smither, 1999; London & Smither, 2002; Garafano & Salas, 2005; McCauley & Hezlett, 2002), a second goal of this study is to investigate whether there are boundary conditions to the influence of a favorable feedback environment on self-development by exploring the moderating effects of two individual differences: feedback orientation and protean career attitude (Figure 1.1). Although a favorable supervisor feedback environment may support self-development by making information more widely available, it is probable that an individual’s general receptivity to feedback and self-directed nature alter the proposed relationships between the supervisor feedback environment and self-development.

The predisposition to seek, evaluate, and use feedback, called feedback orientation, has been linked to supervisor ratings of employee development (Linderbaum & Levy, 2010), feedback seeking (Dahling, Chau, & O’Malley, 2012), supervisor perceptions of the potential to develop as a leader (Braddy et al., 2012), and certain dimensions of empowerment (Gabriel, Frantz, Levy, & Hilliard, 2014). With regard to the present study, having a strong feedback orientation may allow employees to seek out feedback to gain a better perspective on career demands or developmental needs, and employees may feel more accountable to use that feedback by directing attention to self-development. Employees with a weak feedback orientation may alternatively struggle to evaluate feedback information and act on it, or may be threatened by a favorable supervisor feedback environment and refrain from self-development as a result.
Protean career attitude reflects an individual difference in an employee’s tendency to self-manage his or her career. The self-directed component of protean career attitude has been tied to other individual differences that are related to development (Briscoe, Hall, & Frautschy De Muth, 2006) and to active coping behavior, higher performance, and career success (Briscoe, Henagan, Burton, & Murphy, 2012). A self-directed protean career attitude is also likely to affect the supervisor feedback environment-self-development relationship, as individuals who are more self-directed are more likely to act on information that can benefit their career development.

The Present Study

Exploring the direct and indirect relationships between the supervisor feedback environment and self-development serves both theory and practice in performance management by expanding the domain of outcomes associated with feedback contexts to include more distal behaviors associated with performance management in practice, yet ignored in empirical research. Additionally, the present study can inform practice by extending the value of a favorable supervisor feedback environment, introducing a less invasive pathway to encouraging self-development, and exploring how individual differences influence these processes. As an evaluation of the supervisor feedback environment can be a useful diagnostic, organizations may find opportunities to improve self-development for employees by developing supervisors that are more adept at giving feedback that is credible, in the minute, and delivered respectfully. Finally, the present research advances the state of knowledge in the feedback field by examining the conditionality of the effects of a supportive supervisor feedback environment. Doing so allows for researchers and practitioners alike to better understand the specific
circumstances where a supportive supervisor feedback environment is most effective, and how the interaction between the supervisor feedback environment and individual traits affect important employee behaviors within the performance management domain.
H3: The supervisor feedback environment indirectly affects self-development through career insight.
H5: The supervisor feedback environment indirectly affects self-development through perceived need for development.
H6: The supervisor feedback environment indirectly affects career insight through feedback seeking.
H7: The supervisor feedback environment indirectly affects perceived need for development through feedback seeking.

Figure 1.1. Hypothesized relationships in the present study.
CHAPTER II

LITERATURE REVIEW

Most organizations use some form of performance appraisal to provide feedback to employees about their performance, and to help leaders make decisions about allocating limited rewards, including pay and promotions (CEB, 2014; Cleveland, Murphy, & Williams, 1989; Landy & Farr, 1980). Annual performance appraisals have not always been effective at improving performance (e.g., Kluger & DeNisi, 1996), and organizations have devoted time and money to better understand how to manage performance in a more comprehensive fashion. The process of performance measurement and change in organizations has shifted away from performance appraisal, which focused on the evaluation and reporting of employee performance, and towards the broader performance management concept. The term performance management refers to “a continuous process of identifying, measuring, and developing the performance of individuals and teams and aligning performance with the strategic goals of the organizations” and is inclusive of practices beyond formal performance assessment, including the informal and day-to-day activities that improve employee performance and support employee development (p. 2, Aguinis, 2013). This approach serves primarily to support employees’ long-term, sustained ability to change, adapt, and improve (Aguinis,
Rather than focusing on a singular review of the previous year’s performance, comprehensive performance management approaches incorporate performance appraisal, goal setting, individual and career development, and emphasize more frequent, timely feedback to expand employee capabilities. Although this broadened conceptualization of performance management is pervasive in practice and in performance management-related reviews and books, the empirical work on feedback and development domain of performance management has not kept pace, limiting our ability to meaningfully leverage what is known about feedback to benefit employee development research and practice.

The idea that more frequent feedback can bolster employee performance is not new, and attempts to understand the social context’s influence on performance feedback exchanges have shed light on the importance of supportive, open environments to encourage employee feedback seeking (Levy, Albright, Cawley, & Williams, 1995; Steelman et al., 2004; Williams, Miller, Steelman, & Levy, 1998). However, less is known about how the social context surrounding feedback exchange influences longer-term employee performance processes, specifically, employee self-development. The proposed study aims to examine one way employers can support self-development through existing performance management initiatives by linking the social context of feedback to self-development, and examining the individual differences that could enhance or inhibit the effectiveness of a supportive supervisor feedback environment for encouraging self-development. Doing so expands the extant research on feedback to be more inclusive of the performance management domain, and details specific mechanisms
to explain how feedback from supervisors and peers may relate to employee self-development activity.

**Employee Development**

*Employee development* refers to “the expansion of an individual’s capacity to function effectively in his or her present or future job and work organization” (McCauley & Hezlett, 2002, p. 314). Development can be directed or driven by the employee (i.e., self-development) or by the employing organization (e.g., formal mentoring, employee development initiatives), and can include a wide range of tasks, experiences, and other activities, varying in terms of formality and structure, that ideally result in individual growth (Fletcher, 1996). Employee development is important for organizations to the extent that development improves the quality of the workforce and drives performance improvement. While training emphasizes giving employees the capabilities necessary to perform in their current roles, the main objective of employee development is to provide employees opportunities to learn skills and abilities that will enhance their performance beyond their current role and into future roles (Noe, 1996). Employee development has been linked to better employee performance, greater employee commitment to employing organizations, increased job satisfaction, and reduced turnover intentions (Benson, 2006; Birdi, Allan, & War; 1997; Ellinger, 2004).

McCauley and Hezlett (2002) reviewed the extant research on employee development, organizing the literature into three lenses that color how development has been studied: behavior change, self-directed learning, and adult development. Behavior change research focused on understanding how to change behavior at work by examining specific methods, motivation, and training. Researchers using the self-directed learning
lens investigated the person and situation variables that influence deliberate and self-initiated participation and development. The adult development lens focused on a cognitively-based view of learning as an ongoing process, and was especially interested in understanding how people learn.

The term self-development refers to all voluntary activity deliberately undertaken by an employee for the purpose of gaining and maintaining job knowledge, skills, or abilities (Orvis & Leffler, 2011; Tough, 1978). In this sense, self-development is a type of employee development, but not all employee development is considered self-development. The important difference lies in the non-mandatory, self-initiated nature of self-development. Self-development may benefit organizations by removing responsibility for motivating employee development, finding opportunities for employee development, and supporting or formally sponsoring development activities. Organizations that can encourage and facilitate employee self-development can reap the benefits of a highly skilled workforce without shouldering the cost and administrative burden of managing employee development, which is an increasingly important consideration in the modern employment context.

The proposed study continues in the vein of research within the self-directed learning lens, with an underlying interactionist assertion that in the right organizational context, “individuals play an active role in identifying their learning gaps and initiating a process to fill those gaps” (p. 316, McCauley & Hezlett, 2002). The current study furthers research on self-development by examining a newer organizational context variable, the supervisor feedback environment, as an important resource for encouraging employee self-development. Additionally, this study will further the understanding of individual
difference characteristics that may interact with the supervisor feedback environment to affect the likelihood that employees self-develop.

**Employee Development in the Protean Era**

During the first half of the 20th century, businesses in the United States experienced great economic prosperity that created stability for organizations and employees alike. The relationship between employees and their employers was characterized by a “one life/one organization” outlook, where people were largely guaranteed employment by a company, so long as they performed their jobs adequately (Hall & Moss, 1998). This unspoken assumption regarding the roles of individuals and their employing organizations came to be known as the psychological contract, as no formal or legal arrangement explicated the details of the employer-employee relationship (Robinson & Rousseau, 1994; Rousseau, 1995). Over time, the perception of employee entitlement for good performance spread from a lifetime of job security to additional compensation benefits, career development, and advancement within the organization (Hall, 1996). Traditional career development theories reflected the expectation that job performance should be rewarded with linear, hierarchical advancement through set, age-related stages, and informed individual development practices in much the same fashion (Hall & Mirvis, 1996; Fletcher, 1996). That is, employee development was almost exclusively a function of career development, and both were closely tied to a tenure-related, linear progression of positions within the organization.

Generally, the “command and control” managerial approach proliferated in the employee development realm (Hall & Mirvis, 1996; McGregor, 1957). In this context, developmental programs emphasized mastery of task specific skills necessary to
successfully complete the work assigned by a manager or supervisor, in line with the expectation that these qualities were evidence of individual competence (Fletcher, 1996). Becoming independent and differentiating the self from others by demonstrating task proficiency was the hallmark of being fully developed (McIlwee & Robinson, 1992; Rosenbaum, 1989). Additional developmental opportunities were offered to employees who demonstrated the competence and proficiency necessary to advance their career within the organization and, subsequently, who required additional skills to perform in new roles. Employees were granted access to training or other developmental opportunities at fixed points by the employing company for career advancement in order to fill the staffing needs of the organization (Mirvis & Hall, 1996). Because employees tended to spend their entire career working for the same company, the organization’s internal structure provided the framework for how and what was developed for each employee, limiting the need or ability for individuals to be self-directed (Hall & Mirvis, 1996). In this context, employees were passive recipients of development, rather than active managers of it.

Dramatic changes in the business and employment environment have been well-documented in the latter half of the 20th century. Shifts towards globalization, an increased reliance on technology, and the beginning of constant change and disruption in the broader environment have led to changes in the content of work, and thus how organizations structure, staff, and manage jobs. Hall and Mirvis (1996) articulated that these environmental changes have created an organizational demand for adaptive, “pre-trained” workers, who drive their own development in the face of ever-changing job requirements. As organizations reorganized, flattened, and restructured jobs in response
to rapid change, uncertainty upended traditional career patterns as organizations causing employees to become less reliant on organizations for providing stable, structured careers.

The *protean career* is an approach to career self-management and development that evolved from this uncertainty. Unlike the careers of the past, a protean career is defined by the individual rather than the organization, and characterized by self-directed decision making based on one’s own goals and values (Hall, 1976). This change in focus has also shifted individual attitudes and behaviors about seeking, valuing, appraising, and using feedback from strictly performance-enhancing goals towards mastery or learning-oriented goals. Although individuals may not intentionally engage in a protean approach, the changing environmental context has forced the workforce at large to behave in a more self-directed, protean fashion than was advisable or necessary during the “one life/one organization” era, resulting in what some authors called the rise of the “protean era” (Hall & Mirvis, 1996; Mirvis & Hall, 1996).

Many authors have noted the shift of responsibility for development from the organization to the individual as a result of the new employment contract (Garafano & Salas, 2005; Hallier & Butts, 1999; London & Smither, 1999). Employers have adapted accordingly, investing in employee development “not in order to reap the long-term benefits of that development as has been the case in the past—but to attract employees as they are needed” (p. 330, McCauley & Hezlett, 2002). For organizations, having flexible, adaptive, and high quality employees is a competitive advantage as it increases the likelihood for success in a turbulent environment (Hall & Mirvis, 1996). Employers want employees capable of driving their own development, as they face pressure to reduce the
amount of time and money spent on mandated, formal organizational training and development initiatives (O’Toole & Lawler, 2006). The increased attention organizational researchers have given to understanding the individual and organizational factors that influence participation in self-development over the last couple of decades is further evidence to that end. Recent literature has argued that, because development is closely tied to motivating and retaining talent in the protean era, organizations need to understand how individual and environmental differences influence employee development (Lee & Bruvold, 2003; Levy & Williams, 2004; Linderbaum & Levy, 2010). While the responsibility to motivate development is less likely to fall on organizations in the protean era, employers can still benefit greatly from properly supporting employees’ increasing interest in self-development.

**Antecedents of Self-Development**

Although the extant research on employee training and development in general is quite extensive, relatively less attention has been paid to self-development, also called voluntary development. Many empirical studies conducted prior to the 1990s focused on training and development as it related to technical updating for specific roles, or emphasized organizationally mandated development (Maurer & Tarulli, 1994; Noe & Wilk, 1993). However, as emphasis on formal training and development initiatives has declined, organizations have an increased interest in employee self-development. In alignment with the self-directed learning lens, researchers interested in differentiating self-development from the larger body of development research have explored both individual differences and organizational characteristics that influence voluntary employee development.
Noting the paucity of empirical research on voluntary development, Maurer and Tarulli (1994) investigated three groups of antecedent variables that they proposed to be related to participation in voluntary development: (1) environmental perceptions, (2) outcome expectations, and (3) individual characteristics. Specifically, for environmental variables, they expected that perceptions of a supportive work environment (i.e., supervisors and coworkers supportive of development), development-friendly company policies, and a company orientation towards continuous learning would be correlated with increased interest and participation in development activity. In terms of the expected outcome of participation, the authors looked at intrinsic motives (e.g., more interesting work), extrinsic outcomes (e.g., better pay), and psychosocial development (i.e., reaching one’s full potential). Employee values were measured by weighting the environmental factors and expected outcomes by ratings of importance for each respondent.

Individual differences believed to be influential in training and development were job involvement, career insight, awareness of need for skill improvement, and self-efficacy. Employees were expected to be more likely to self-develop when they considered work to be a central part of their lives, were knowledgeable about their career strengths, weaknesses, and goals, were aware of a need to improve career-related knowledge or skills, or held a belief that they were capable of performing a learning task. In summary, Maurer and Tarulli hypothesized that supportive environments, valued outcomes, and the right individual characteristics would relate to development outcomes (Figure 2.1).
To test these hypotheses, Maurer and Tarulli (1994) considered several voluntary development variables as outcomes: previous participation in development (in-house, external, and total), interest in and motivation for general learning and development, and intention to participate in development. Survey data received from over 1,300 sales, technical, and clerical employees of one organization were analyzed and generally supported the hypothesized positive relationships between the three antecedent variable groups and self-development in general; however, breaking down results within each variable group revealed a more nuanced picture.

Regarding perceptions of the environment, a development-friendly company policy was consistently and positively related to past participation in development, while coworker support was unrelated or negatively related to previous participation. Company learning orientation and supervisor support were not uniquely related to self-development outcomes, which suggests that company policies were most consistently predictive of voluntary development participation. However, when past participation in development
was controlled for, company policies actually had a negative relationship to intended participation in future development, yet company policies were predictive of interest and motivation related to future development. This finding suggests that company policies may paradoxically inspire interest and motivation in participation, while inhibiting intentions to participate. Additionally, as expected, the positive relationship between supervisor support and future development outcomes was moderated by the value placed on supervisor support. The greater the importance employees placed on supervisor support, the stronger the relationship between supervisor support and both interest and intention to participate in future development. In summary, the aspects of environmental support as conceptualized had differing effects on each development outcome, and no measure of environmental support was uniformly encouraging of self-development.

For outcome expectancy, a similar interactive effect was found for only one of the three outcome expectancy factors. The more employees valued the intrinsic outcomes of development, the stronger the positive relationship between the intrinsic outcome expectancies and self-reported past development participation, and interest, motivation, and intention to participate in future development. Generally, the three outcome expectancy variables were not especially related to reported past participation, sharing less unique variance with development outcomes overall than did either personal or environmental factors. Extrinsic expectancies were most consistently predictive of intended future participation, while psychosocial was most predictive of interest and motivation in future development. To summarize, expectancy outcomes did not have a consistent, meaningful relationship with the development outcomes (Maurer & Tarulli, 1994).
Finally, of the three groups of variables, personal characteristics accounted for more variance in voluntary development in general compared to the environmental support variables or outcome expectancy, but no single personal characteristic consistently held the strongest relationship across the five voluntary development outcomes. With regards to past participation in development, career insight was the strongest predictor of total participation and participation in external development of all of the personal characteristics, and self-perceived need for improvement was the strongest personal characteristic predictor of in-house development participation.

Several key takeaways summarize Maurer and Tarulli’s (1994) findings. First, carefully operationalizing self-development is important, as person, environment, and outcome expectancies had differing relationships with the five voluntary development outcomes included. Personal characteristics generally carried the most predictive power across outcomes, and the relative influence of environmental perceptions and outcome expectancy fluctuated. Second, the role of social support in self-development was especially tenuous. The relationship between supervisor support and development outcomes was moderated by the extent to which employees valued the supervisor support, and perceptions of coworker support were essentially detrimental to development. Organizations seeking to increase self-development participation may need to strategically engage managers to be mindful of individual differences and find alternative approaches to including co-workers more effectively in support structures.

Third, personal characteristics accounted for the most unique variance in voluntary development when all of the factors were considered simultaneously. Of these variables, career insight was most predictive of past participation. That is, employees
who reported stronger understanding of their career goals were most likely to have already participated in developmental activities. Maurer and Tarulli (1994) concluded that “to the extent an employee gains knowledge of his or her skills, weaknesses, and interests, and also learns about various career opportunities, career paths, and so on, he or she may be more likely to see the relevance and value of development activities” (p. 12).

Based on these conclusions, organizations could feasibly support employee self-development more effectively by encouraging managers to be more communicative about employees’ skills and abilities, and by increasing visibility for career opportunities, allowing employees to gain the kind of knowledge that is expected to make self-development seem more relevant and valuable.

Additionally, awareness of development needs was most predictive of future interest and motivation related to self-development. Here, the authors agree with previous assertions that employee self-assessment is valuable in the development context to an extent (e.g., Ashford, 1989; Noe & Schmitt, 1986), but argue that “performance or skill feedback provided by an organization should be perceived as credible, accurate, useful, and sufficiently detailed… for it to affect the person’s own beliefs about his or her developmental needs” (pp. 12-13). In other words, feedback from other sources that is useful, credible, detailed, and accurate serves as an important information resource for employees alongside their own self-evaluations of their performance, skills, or abilities.

Collectively, these conclusions elucidate the importance of credible, accurate, and useful feedback to inform employee perceptions. Managers providing this kind of feedback may be able to support self-development indirectly by informing employees’ developmental needs, which in turn, may help employees see the relevance and value of self-
development activity. Maurer and Tarulli’s (1994) findings suggest that no single variable likely dictates employee self-development behavior, and they suggested that future research should continue to explore relevant constructs in light of the reality that organizations may be unable to intervene on all factors at once.

Maurer and colleagues (2003) continued the exploration of participation in development by proposing and testing an age-related model of individual, situational, and motivational variables believed to affect involvement in learning and development activities related to work. Using the theory of reasoned action and theory of planned behavior as a theoretical basis for the model (Azjen, 1991; Fishbein & Azjen, 1975), they expected that individual characteristics and situational context variables would then be related to attitudes about development, which would be related to intentions to participate in self-development, and intentions would be expected to increase the likelihood of participation (Figure 2.2).
Generally, Maurer and colleagues hypothesized that age was related to several individual learning preparedness variables (i.e., prior participation, learning anxiety, perceived intelligence, learning qualities, declining mind, and general self-efficacy) and career variables (i.e., career insight, perceived need for development, and job involvement), and to work and nonwork support. As depicted in Figure 2.2, these antecedent variables were hypothesized to have a specific pattern of relationships with affective and motivational constructs: self-efficacy and perceived benefits of training (intrinsic or extrinsic). Finally, self-efficacy and benefit perceptions were expected to trigger a mediational chain linking these attitudes to intentions to participate, and ultimately, to participation (Azjen, 1991).
Results from the multiwave survey study were supportive of Maurer and colleagues’ theory and hypotheses about the attitude-intention-behavior link. For the antecedent variables, individuals who believed they possessed the qualities necessary to learn (e.g., “I possess the skills and abilities needed to develop, grow, and learn in my career” p. 714), were most likely to have a positive attitude about development. Perceived need for development had the next largest indirect effect on attitudes toward development. In other words, employees who expected training to have intrinsic benefits showed the strongest indirect effect on intentions to participate in training. However, previous participation in development activity had the strongest indirect effect on participation, and a strong direct effect on intention to participate in the future. As expected, attitudes in favor of development positively affected intentions to participate, which became actual participation one year later (Maurer et al., 2003).

Taken together, employees who felt they possessed the qualities needed to learn, who perceived a need for development, and who expected there would be intrinsic benefits to participation were most likely to have positive attitudes about participating, to intend to participate, and ultimately, were more likely to participate in development activities. Of note, the presence or absence of work support as conceptualized had no indirect impact on participation. Maurer and colleagues measured company, supervisor, and co-worker support using items tapping the extent to which each source supported or encouraged participation in development, or believed that learning and training was important (Maurer & Tarulli, 1994; Maurer et al., 2003). Thus, it appears that supervisors and coworkers who value development and encourage participation may not be sufficient forms of support for self-development. In concert with findings from these studies, it is
likely that employees need more from their supervisors, coworkers, and employing organizations than cheerleading, development activity menus, and development-friendly policies in order to effectively participate in voluntary development activity.

Building on previous research using the theory of planned behavior, Hurtz and Williams (2009) also examined attitudinal and motivational antecedents to voluntary development participation. As with Maurer et al. (2003), this theoretical assertion was largely supported, although several findings stood out. First, of the individual characteristic variables included in their model as antecedents to attitudes, only learning goal orientation had a notable effect. Learning goal orientation describes the extent to which individuals display a desire to learn new skills and increase their competency (Dweck & Leggett, 1988). Employees who have this desire to learn are theorized to participate in developmental activities voluntarily because they are motivated by the intrinsic benefits of learning (Garafano & Salas, 2005), an idea that is partially supported by the findings reviewed here (Maurer & Tarulli, 1994; Maurer et al., 2003; Hurtz & Williams, 2009). Second, and in line with theory of planned behavior and theory of reasoned action (Azjen, 1991; Fishbein & Azjen 1975), attitudes were found to be very strongly related to intentions to participate, and intentions had a substantial impact on future participation. Organizations could target efforts on improving attitudes about self-development to encourage eventual participation. Third, the perceived availability of activities had the largest effect on self-development. When employees were aware of opportunities, participation rates increased. The authors suggest that advertising opportunities should be a key initiative for organizations hoping to increase participation (Hurtz & Williams, 2009).
Continuing in the vein of research examining both individual and contextual factors affecting self-development, Orvis and Leffler (2011) explored how individual characteristics and the organizational context interacted to affect self-development. Previous research findings suggested that individual differences carried most of the influence on eventual participation when considered alongside environmental factors (e.g., Maurer & Tarulli, 1994; Maurer et al., 2003); however, previous research was based on indirect effect models, and did not truly examine the interactive effects of personal and environmental characteristics. Orvis and Leffler proposed that the effect of a supportive work environment, assessed using Maurer et al.’s (2003) measure, on the quantity of self-development was contingent upon individual characteristics of the employee. Specifically, they hypothesized that a supportive work environment would interact with each of five individual differences to support an increased participation in self-development, such that the relationship between work support and self-development would be stronger when individuals lacked high learning goal orientation, self-efficacy for self-development, openness to experience, conscientiousness, or a proactive personality. In other words, they argued that a supportive work environment provided a buffering effect for individuals who lack the dispositional characteristics to participate in self-development on their own.

Results supported this pattern for learning goal orientation, openness, and conscientiousness: the relationship between work support as conceptualized and self-development was non-existent for those high on the individual traits, and was stronger and positive for those low on these traits (Orvis & Leffler, 2011). Employees who are learning-goal oriented, open, or conscientious do not benefit from a supportive work
environment, as conceptualized. Additionally, both conscientiousness and proactive personality were positively related to quantity of self-development, but did not moderate the work support-self-development relationship. Orvis and Leffler’s contributions helped to clarify the role of work support for enabling participation in development, while also reinforcing the value of certain individual difference characteristics that relate to self-development outright.

Taken together with other research examining the role of work support as conceptualized and measured by Maurer and colleagues (Maurer & Tarulli, 1994; Maurer et al., 2003), there is little evidence for a universal value of supportive organizational policies, supervisors, and co-workers that value training and development or that encourage participation in development. Interestingly, supportive co-workers may be detrimental to self-development (Maurer & Tarulli, 1994), and supervisor support may only serve to benefit employees with personal characteristics that do not lend them to a self-directed interest in development, or to employees who value supervisor support (Maurer & Tarulli, 1994; Orvis & Leffler, 2011). Consistently, to the extent that employees see development as beneficial (Maurer & Tarulli; Maurer et al., 2003), have positive attitudes about development (Hurtz & Williams, 2009; Maurer et al., 2003; Orvis & Leffler, 2011), and are aware of their particular developmental needs (Maurer & Tarulli, 1994; Maurer et al., 2003), employees are more likely to self-develop. Thus, it seems highly likely that when managers clarify the value of development, support employee development behaviors and foster positive attitudes about development, and direct employees’ attention to developmental gaps, managers may more effectively support employees as they pursue self-development. That is, organizations may be better
able to increase employee self-development by increasing employees’ awareness of developmental needs and career insight than by crafting pro-development policies or encouraging moral support in the work environment.

One mechanism for promoting positive developmental attitudes, communicating opportunities, generating awareness for development gaps, and providing support is the provision of feedback. *Feedback* is information typically provided by a supervisor that can greatly support employee development by directing attention to skill and performance gaps and providing descriptive, behavioral information regarding how the gaps can be resolved (Ilgen et al., 1979; Kluger & DeNisi, 1996; Li, Harris, Boswell, & Xie, 2011; London et al., 1999; London & Smither, 1999; Oldham & Cummings, 1996; Taylor, Fisher, & Ilgen, 1984). Feedback has been a popular subject of research for years as researchers attempted to understand how and why individuals seek, value, appraise, and use feedback to improve work performance (Ilgen et al., 1979; Kluger & DeNisi, 1996). Until recently, most feedback literature addressed feedback in a job or task performance context, where employees need feedback from their supervisors, peers, and customers in order to understand, evaluate, and improve their performance on task work associated with their assigned duties. As the performance management domain expands, feedback can be valuable as a tool to direct attention in any behavior change initiative, not just task performance improvement. The role of feedback in any performance management process can be explained using a control theory perspective on self-regulation of behavior (Carver & Scheier, 1981; Gregory, Beck, & Carr, 2011; Lord & Levy, 1994).
The Role of Feedback in Self-Regulation and Self-Development

Control theory describes motivation as an ongoing process people use to monitor progress towards a goal and has been useful in understanding how individuals respond to feedback, especially in a developmental context (Gregory et al., 2011; Scheier & Carver, 1988; Taylor et al., 1984). In basic control theory, an input (behavior) is compared to an established standard, and the result of that comparison (feedback) provides information about whether or not the goal or standard has been met. If a discrepancy between the input and a standard exists, the feedback provided by the comparison informs an individual to either (a) adjust the input and re-evaluate it against the standard, or (b) adjust the standard of comparison in order to meet a goal. If there is no discrepancy, the individual will not likely be motivated to adjust input. In either scenario, the comparison process yields valuable information for future comparisons, and the cycle continues until discrepancies are successfully reduced, or are further produced by raising a standard higher (Lord & Levy, 1994).

From a control theory perspective for self-regulating behavior, feedback plays a critical role in triggering the awareness of a discrepancy between an existing state and a desired state, but can also play an important role in translating that cognitive realization into behavioral action (Carver & Scheier, 1981; Lord & Levy, 1994; Taylor et al., 1984). In the coaching literature, Hunt and Weintraub (2002) quite literally refer to the role of feedback in control theory processes, asserting that “feedback serves as a source of information… allowing [an individual] to assess the gap between desired and current performance” (p. 40). As described previously, feedback is one way individuals collect information about their capabilities and build career insight (De Vos & Soens, 2008).
Feedback from the environment and feedback inherent in work tasks can also inform employees as to their competencies, and trigger a perceived need for development when their abilities do not meet expected standards (Hackman & Oldham, 1976; Ilgen et al., 1979; London & Smither, 2002; Steelman et al., 2004). The importance of feedback for performance improvement has been well documented (e.g. Ilgen et al., 1979; Kluger & DeNisi, 1996; Taylor et al., 1984), and may be one of the most crucial factors in any learning process as it directs attention to the need for or value of behavioral change (Kuchinke, 2000; Salas & Rosen, 2010). Employees who are unaware of a discrepancy between performance and important standards are unlikely to be motivated to adjust their behavior.

When applied to self-development, control theory can explain how employees use feedback to monitor their progress and to evaluate how and where to expend energy related to their development. Here, feedback functions as it does in the traditional performance feedback literature, serving to inform employees of current capabilities and performance related to a desired goal (Gregory et al., 2011; Jex & Britt, 2008). When feedback reveals a discrepancy between perceived abilities and goals, the information should trigger a behavior to remedy that discrepancy, namely self-development. This self-regulation process is critical to effectively driving voluntary development. As organizations are less inclined to direct individual development in the protean era, employees now bear more responsibility for regulating the process. To self-regulate successfully, employees need to have access to information about current capabilities and performance and be able to evaluate that information against what the goal requires (Kluger, & DeNisi, 1996; London & Smither, 1999; McEnroe, 1989; Taylor et al., 1984).
The Role of the Organization in Self-Development

Although the responsibility for managing development has generally been shifted to the employee, organizations greatly benefit from a workforce that is able to perform well in current rules, and adapt to future job challenges without retraining. As previously described, not all employees possess the traits that lead to an intrinsic and self-motivated interest in development (Maurer & Tarulli, 1994; Maurer et al., 2003; Orvis & Leffler, 2011). From the perspective of the self-directed learning lens (McCauley & Hezlett, 2002), organizations can play a critical role in bolstering self-development for all employees. Previous self-development research suggests that the simplest intervention for the organization may be increasing perceptions of organizational support by making employees more aware of developmental activities and opportunities and advertising a favorable attitude towards employee self-development (Hurtz & Williams, 2009; Orvis & Leffler, 2011). Control theory would suggest that when attention is directed to gaps between desired states and current states, behavioral change is likely to happen.

Stemming from this recommendation, it seems sensible to examine qualities of the organizational environment that facilitate information sharing and employee awareness in order to encourage employee participation in development. Taking the control theory framework into consideration, employees who have information about their performance available to them may be better able to assess their developmental needs and self-regulate accordingly. The context surrounding feedback information exchanges, called the feedback environment, likely plays an important role in facilitating communication that affects self-development.
The Feedback Environment

The feedback environment has previously been defined as the amount and type of performance information that employees perceive to be available to them at work (Herold & Parsons, 1985). Early feedback environment research focused on several sources of feedback, including formal rules and communications, an individual’s thoughts or feelings, information gleaned from tasks, and feedback from supervisors and peers (Dahling & O’Malley, 2011). The first tool to measure the feedback environment focused explicitly on the amount of positive or negative feedback provided to employees (Herold & Parsons, 1985).

Acknowledging some deficiency in Herold and Parsons’ conceptualization, Steelman and colleagues (2004) expanded the construct to include several qualitative facets subsumed within two main sources of feedback: the supervisor and coworkers. Rather than simply assessing how much positive and negative feedback is available, the Feedback Environment Scale (FES) assesses seven facets of feedback from the supervisor and coworker sources. Source credibility refers to perceptions of the supervisor and coworker’s knowledge or expertise, and trustworthiness to provide accurate information. Feedback quality describes the extent to which feedback received from the supervisor and coworkers provides valuable information for performance change. Feedback delivery assesses whether the manner in which feedback is provided is considerate, respectful, and supportive. Favorability of feedback refers to the provision of positive feedback when a job is well done, while unfavorability of feedback deals with the provision of negative or improvement-oriented feedback when performance is not acceptable. Source availability refers to how accessible the supervisor and coworkers are
related to seeking and receiving feedback. Finally, *promotes feedback seeking* assesses whether or not the source seems encouraging of attempts to seek feedback. Based on this conceptualization, a favorable feedback environment exists when supervisors and/or coworkers delivering feedback are perceived as credible, deliver meaningful feedback in a considerate and supportive fashion, provide both positive and negative feedback, are readily available, and encourage feedback seeking behaviors (Steelman et al., 2004).

Development of the FES revealed that most supervisor and coworker facets were positively and significantly correlated with employee satisfaction with feedback, motivation to use feedback, and propensity to seek feedback (Steelman et al., 2004). Additionally, supervisor feedback environment facets showed moderate to strong positive relationships with leader-member exchange (LMX), suggesting a favorable supervisor feedback environment is linked to, but not redundant with high-quality supervisor-subordinate relationships. In a predictive analysis, many facets of both supervisor and coworker feedback environment were predictive of satisfaction with feedback and motivation to use feedback two months later, while fewer predicted feedback seeking at the second time point. Taken together, employees’ motivation and attitude concerning feedback is affected by the supervisor and coworker feedback environment they experience, making the feedback environment an important contextual consideration in performance management. Steelman et al. (2004) concluded that the FES was an effective tool to measure and diagnose strengths and weaknesses in order to provide additional coaching and development to those tasked with providing feedback on the job.
Correlates and Consequences of the Feedback Environment

Subsequent research on the feedback environment has supported the importance of having a favorable feedback environment for employee affect and motivation, and has explored relationships between the feedback environment and performance outcomes, wellbeing, and empowerment. Norris-Watts & Levy (2004) found that favorable supervisor feedback environments were related to organizational citizenship behaviors (OCB) directed at both individuals and the organization, and that this relationship was mediated by affective commitment. Employees who experienced a favorable supervisor feedback environment were more likely to feel committed to their organization, and thus more likely to go above and beyond to help out at work. Norris-Watts & Levy’s (2004) findings extend Steelman et al. (2004) by demonstrating the value of a favorable feedback environment for employee affect, and how affect translates into an organizational benefit in the form of OCBs. Along the same lines, Peng and Chiu (2010) linked the supervisor feedback environment to OCBs through affective cognition and attitude. Specifically, they hypothesized that a favorable supervisor feedback environment relates to increasing participation in OCBs through increasing positive affective cognition (person-organization fit) and decreasing negative affective cognition (role stressors), which in turn affect positive attitude (organizational commitment) and negative attitude (job burnout), respectively. These hypotheses were supported, extending the work of Norris-Watts and Levy (2004) by further explicating the mediational chain connecting the supervisor feedback environment to OCBs through affect and attitude.

A favorable feedback environment has also been implicated in higher job performance ratings in several studies. Rosen and colleagues (2006) examined the effect
of the feedback environment on job performance (both task performance and OCB) through perceptions of politics and employee morale. The researchers theorized that a favorable feedback environment, characterized by increased informal feedback sharing from supervisors and coworkers, should relate to employees perceiving less political influence in the office, as environments with more feedback tend to reduce ambiguity and uncertainty by guiding behavior and reinforcing effective behavior, while discouraging or reducing ineffective behavior. When employees have a clear understanding of expectations and the actions necessary to reach those expectations, the opportunity to perceive that something else (i.e., politics) is influencing decisions decreases. Subsequently, these employees were expected to have higher levels of job satisfaction and affective commitment to the organization, and to perform their work tasks and engage in OCBs more frequently.

As expected, more favorable coworker and supervisor feedback environments were associated with lower perceptions of organizational politics, which were related to higher levels of employee morale, and higher employee morale was positively associated with higher task performance and OCBs. While both supervisor and coworker feedback environments had a significant effect on the outcomes, the supervisor feedback environment’s effect was markedly stronger, suggesting that supervisors can be especially influential in decreasing perceptions of politics via provision of a favorable feedback environment. Additionally, these findings suggest that employees can and do discriminate between the two feedback environment sources. Rosen et al. (2006) concluded that increased availability of information about the kind of behaviors that are
desirable and valued at work, facilitated by a favorable feedback environment, may help to reduce the perception of politics and ultimately influence performance outcomes.

A later study examining the effects of the feedback environment on job performance also demonstrated that information availability is an important correlate of a positive feedback environment. Whitaker et al. (2007) hypothesized that a favorable supervisor or coworker feedback environment would encourage feedback seeking from the supervisor or coworker respectively, in turn providing greater role clarity to employees by reducing uncertainty about work performance and processes. Employees with better role clarity were then expected to have higher task and contextual performance.

Consistent with their expectations, perceptions of favorable feedback environments were associated with greater feedback-seeking from supervisors and coworkers, and feedback seeking was positively related to task and contextual performance via greater role clarity. Additionally, a favorable supervisor feedback environment was directly and quite strongly related to role clarity, suggesting that supervisors who create a favorable feedback environment influence employees’ understanding of their roles directly, as well as indirectly through more frequent employee feedback seeking. Taken together, Whitaker et al. (2007) suggest that “available, supportive supervisors may… prime employees to become self-aware… and to focus on known role information” (p. 585) in addition to encouraging employees to be more active in seeking feedback. Favorable feedback environments encourage feedback seeking, but also, and importantly, provide clear information to employees about standards of performance, which facilitates employee performance improvement (Rosen et al., 2006; Whitaker et al., 2007).
A stream of research has also examined the effects of a favorable feedback environment on employee satisfaction and wellbeing. As mentioned, Rosen et al. (2006) established a correlational relationship between a favorable feedback environment and affective commitment and job satisfaction. In a longitudinal study of Belgian government employees, Anseel and Lievens (2007) found that the favorable supervisor feedback environment-job satisfaction relationship was fully mediated by LMX. The favorable supervisor feedback environment influenced job satisfaction five months later through quality supervisor-subordinate relationships, suggesting the lasting, positive effects of a favorable feedback environment.

Building on this relationship between the supervisor feedback environment and job satisfaction (Anseel & Lievens, 2007; Rosen et al., 2006), Sparr and Sonnentag (2008) explored other mediators that may explain why the supervisor feedback environment influences job satisfaction, using a more inclusive domain of wellbeing constructs. Specifically, the researchers expected that a favorable supervisor feedback environment would lead employees to believe that they have personal control over and can obtain important information about their work and that they have personal control over and can influence decisions about their work and how it is completed. Sparr and Sonnentag argued that feedback about employee performance and outcomes at work serves as information that is essential to experiencing control as it links behaviors to outcomes (Greenberger & Strasser, 1986) and that information is an important predictor of personal control (Skinner, 1996). A favorable supervisor feedback environment should enhance feelings of personal control because it allows employees to “learn about others’ expectancies…gain an adequate picture of competencies and performance… accurately
assess their behavior efficiency… quickly figure out if changes in their behavior go the right direction” (p. 393, Sparr & Sonnentag, 2008). These feelings of control were expected to positively relate to job satisfaction, and negatively relate to job anxiety, job depression and turnover intentions.

Sparr and Sonnentag (2008) also explored the role of helplessness in the supervisor feedback environment-wellbeing relationship. Unlike personal control, feelings of helplessness can be learned when people perceive they cannot change a situation through their own action, and they may behave passively in the same situation in the future as a result. Helplessness has been negatively associated with well-being outcomes previously, and the authors expected this finding to hold. A favorable supervisor feedback environment was expected to relate to wellbeing through decreased perceptions of helplessness on the job.

These hypotheses were largely supported: favorable supervisor feedback environments were related to decreased job depression and increased job satisfaction via personal control over information, and to job satisfaction through personal control over decisions (Sparr & Sonnentag, 2008). The mediating effects of helplessness were especially strong, as a favorable supervisor feedback environment was related to increased job satisfaction, decreased job depression, and decreased turnover intentions through lessened feelings of helplessness. Taken together, their findings support the notion that favorable supervisor feedback environments support employee wellbeing by boosting feelings of control and reducing feelings of helplessness in the workplace (Sparr & Sonnentag, 2008). Of the two personal control variables, personal control over information was a stronger mediator than personal control of decisions, echoing the
findings of Rosen et al. (2006) and Whitaker et al. (2007) regarding the importance of information availability, reduction of ambiguity, and clarity in the feedback environment-employee outcome relationship.

Building on Sparr & Sonnentag’s (2008) findings supporting the importance of the supervisor feedback environment for enhancing employee’s perceptions of control, a recent longitudinal study explored the boundary conditions of the supervisor feedback environment as it affects psychological empowerment. Gabriel et al. (2014) defined empowerment as the extent to which individuals feel control over their work environment, characterized by four dimensions: meaning, competence, self-determination, and impact. Levels of empowerment on all four dimensions were expected to be predicted by the extent to which the supervisor feedback environment was favorable. However, Gabriel and colleagues (2014) also argued that expecting a linear relationship between the supervisor feedback environment and empowerment essentially ignores both theory and empirical work indicating that individual differences play a role in the effectiveness of feedback exchange (e.g., Ilgen et al. 1979; Linderbaum & Levy, 2010; London & Smither, 2002).

Accounting for previous research, Gabriel et al. (2014) explored the moderating effects of an individual difference related to feedback acceptance and use: feedback orientation. *Feedback orientation* refers to an individual’s overall receptivity to feedback and has been implicated as an important individual characteristic that influences how employees respond to feedback, and is considered to be a quasi-trait (Linderbaum & Levy, 2010; London & Smither, 2002). Gabriel and colleagues hypothesized that the relationship between the supervisor feedback environment and employee empowerment
would be stronger when employees had a high feedback orientation, and weaker when employee feedback orientation was low, as people who are more feedback oriented are likely to thrive when feedback is readily available and feel more capable and accountable for using feedback compared to those who are not.

Results partially supported Gabriel et al.’s (2014) assertions. A favorable supervisor feedback environment was positively related to two empowerment dimensions, meaning and impact, three months later, but was not related to competence or self-determination. Additionally, feedback orientation moderated the relationship between supervisor feedback environment and overall empowerment, such that the positive relationship between a favorable supervisor feedback environment and empowerment was stronger for those high in feedback orientation than for those low in feedback orientation. The same moderating pattern held for the meaning dimension of psychological empowerment. Interestingly, the moderated relationships between supervisor feedback environment and competence and self-determination actually switched from positive to negative: the authors found positive relationships between a favorable supervisor feedback environment and these two components of empowerment three months later for employees with a high feedback orientation, but negative relationships between a favorable supervisor feedback environment and competence and self-determination for employees with low feedback orientation. For employees who are not receptive to feedback, a favorable supervisor feedback environment at time one actually predicted lower competence and self-determination three months later. Gabriel et al.’s (2014) findings suggest that while a favorable supervisor feedback environment may
be empowering to an extent, differences in feedback orientation ultimately affected whether information availability resulted in self-determined employees.

Research exploring the feedback environment suggests there are several benefits to a favorable supervisor feedback environment for organizations and employees alike. Employees who experience favorable supervisor feedback environments perform better than employees who do not (Rosen et al., 2006; Whitaker et al., 2007), have higher morale and better attitudes about their jobs, and stronger commitment to their organizations (Anseel & Lievens, 2007; Rosen et al., 2006; Sparr & Sonnentag, 2008), feel greater control over work information and decisions (Gabriel et al., 2014; Sparr & Sonnentag, 2008), and experience greater awareness, clarity, and information availability (Rosen et al., 2006; Whitaker et al., 2007) than employees in unfavorable supervisor feedback environments. Previously reviewed research exploring environmental influences of self-development suggested that organizations should look to improve employee awareness of skills and abilities, attitudes toward development and perceived value of development in order to increase employees’ self-development participation (Hurtz & Williams, 2009; Orvis & Leffler, 2011). However, most of the reviewed research on environmental support for self-development has exclusively examined supervisor or coworker encouragement, removing barriers to participation, and having pro-learning attitudes, essentially ignoring characteristics of the environment that facilitate information sharing, awareness of personal strengths and weaknesses, or clarity on job roles. As the effect of a favorable supervisor feedback environment has been demonstrated on employees’ attitudes, feelings of control, perceptions of information availability, and clarity about their jobs, it is reasonable to expect that a favorable
supervisor feedback environment should also have a positive effect on employee self-development.

Other research has identified the work environment as the strongest contributor to informal learning in the workplace, as employees look to peers and colleagues to gain information related to their jobs (Tannenbaum, Beard, McNall, & Salas, 2010). By providing positive and negative feedback that is more accurate and credible, delivered more thoughtfully, and more readily available, a strong favorable feedback environment should affect employee outcomes beyond the scope of job performance.

Although no research has empirically examined the relationship, the effects of a favorable supervisor feedback environment should contribute to employee self-development (London & Smither, 1999). Readily accessible information about performance should facilitate both the development of insight and an accurate understanding of an individual’s capabilities. When feedback is accurate, available, and from a credible source, the propensity to seek and use information to inform self-development should increase further. Additionally, because a favorable supervisor feedback environment should facilitate more open communication about individual performance, it should be easier for employees to collect information about performance on competencies and/or skill and ability development that is not directly associated with work tasks. Specifically:

**Hypothesis 1: The supervisor feedback environment positively relates to self-development.**

Although it is likely that the supervisor feedback environment has a general effect on self-development, the research reviewed previously suggests that the supervisor feedback
environment shares variance with employee perceptions that likely correlate with self-development. To better understand how the supervisor feedback environment may indirectly relate to self-development, I posit several mediating variables that may explain how the qualities of a favorable supervisor feedback environment inform self-development, using control theory as an explanatory framework (Carver & Scheier, 1981).

**Career Insight and Perceived Need for Development**

As previously described, feedback provides information about the standards and expectations of the job environment and whether or not an individual is meeting those standards (Ilgen et al., 1979). Both pieces of information are necessary in order to effectively direct efforts to reach goals (Carver & Scheier, 1981). While it is hypothesized that the supervisor feedback environment relates to participation in self-development, it is likely that the effect occurs in part because feedback informs career insight and makes employees aware of developmental needs. Career insight and perceived need for development have both been identified as predictors of interest and participation in self-development (Maurer & Tarulli, 1994; Maurer et al., 2003). In the following pages, I review literature on both constructs and suggest how they may be affected by a favorable supervisor feedback environment in the context of control theory.

**The Feedback Environment and Career Insight**

*Career insight* is generally defined as the extent to which an individual is knowledgeable about his or her career-related strengths and weaknesses, plans and goals, and current situation (London, 1983; Maurer & Tarulli, 1994). Consistent with control theory, employees with strong and well-developed knowledge of the demands of their
career goals should be more likely to take the necessary steps to achieve those goals than employees who lack the knowledge (Carver & Scheier, 1981). Career insight has frequently been examined in tandem with career self-management behaviors in the protean career literature, and is considered to be a key meta-competency associated with effectively planning and the decision making necessary for making meaningful choices and to help employees to direct behavior towards career-related goals (DeVos & Soens, 2008).

As a favorable supervisor feedback environment is characterized by highly available information about expectations and standards (e.g., Rosen et al. 2006) and encourages feedback seeking (Steelman et al., 2004), favorable supervisor feedback environments should help employees to have a better sense of the requirements for progression in their chosen career and to form clearer career goals. A favorable supervisor feedback environment is proposed to help employees learn about others’ expectations and to gain a better understanding of their skills, abilities, and performance. Additionally, favorable feedback environments have been linked to increased feelings of personal control over information and decisions at work (Sparr & Sonnentag, 2008). In line with this research, it is expected that a favorable supervisor feedback environment relates to increased career insight.

*Hypothesis 2: The supervisor feedback environment positively relates to career insight.*

Previous research has established that individuals with a good understanding of the requirements of career success are more likely to participate in self-development (Maurer & Tarulli, 1994; Maurer et al., 2003). The current study proposes that career
insight is a mechanism by which a favorable supervisor feedback environment translates into behavioral participation in development. Because a favorable supervisor feedback environment is characterized by credible, accurate, and available information, it is reasonable to anticipate that the feedback environment gives an employee an accurate picture of others’ expectations and of his or her capabilities and thus greater career insight. With greater career insight, employees will be more likely to participate in employee development. In other words:

_Hypothesis 3: The supervisor feedback environment indirectly affects self-development through greater career insight._

**The Supervisor Feedback Environment and Perceived Need for Development**

When feedback is accurate, available, and from a credible source, employees are more likely to seek and use feedback information to guide behavior change (Dahling et al., 2012; Gregory et al., 2011; Linderbaum & Levy, 2010). The supervisor feedback environment is expected to influence self-development by making information about employees’ knowledge, skills, abilities, and developmental gaps more available to employees, who are more likely to self-develop when they perceive a need for it (Maurer et al., 2003). The measures of perceived need for development used in the reviewed studies linking the construct to developmental behavior ask respondents to indicate the extent to which they have skills or abilities that are in need of development, suggesting that regardless of whether or not an employee _actually_ needs to develop a skill, that employee is more likely to do so if he or she perceives the need (Maurer & Tarulli, 1994).
Although research has not established a relationship between the supervisor feedback environment and need for development, extant research has found that the supervisor feedback environment is related to greater role clarity, increased perceptions of information availability, and reduced ambiguity about performance effectiveness (Rosen et al., 2006; Whitaker et al., 2007). O’Malley and Gregory (2011) asserted that effective developmental feedback should include both positive and negative information about an employee’s current capabilities. Unfortunately, many supervisors may avoid giving negative feedback, thus withholding information that could help employees identify areas where their performance might be improved. However, a favorable supervisor feedback environment is characterized by both positive and negative feedback information that is delivered thoughtfully by someone perceived as credible and available (Steelman et al., 2004). As a result, it is likely that employees experiencing a favorable supervisor feedback environment are more likely to get feedback that identifies skill or ability gaps than are employees who do not. Employees with a favorable supervisor feedback environment may be more receptive to this kind of feedback because of how it is delivered and the source delivering it. In the context of control theory, having both types of information available facilitates the process of comparing current capabilities to a future desired state associated with the demands of career goals. A favorable supervisor feedback environment, by making accurate, credible information about strengths and weaknesses more available, should relate to the likelihood that employees perceive developmental need.

_Hypothesis 4: The supervisor feedback environment positively relates to perceived need for development._
Because a favorable feedback environment should facilitate more open communication about individual performance, it should be easier for employees to collect information about development needs. A thorough understanding of one’s developmental needs has been theoretically and empirically linked to increased participation in developmental activity (Maurer & Tarulli, 1994; Maurer et al., 2008; Noe, 1986; Noe & Schmitt, 1986; Noe & Wilk, 1993). Taken together, it is expected that the supervisor feedback environment, by making information available to employees about current capabilities and developmental gaps, should be related to employees’ perceived need for development, which should in turn result in participation in self-development activities.

_Hypothesis 5: The supervisor feedback environment indirectly affects self-development through perceived need for development._

**The Feedback Environment and Feedback Seeking**

Feedback seeking is one type of self-management behavior that is important for both performance improvement and employee development (London et al., 1999). As originally presented, _feedback-seeking behavior_ refers to a “conscious devotion of effort toward determining the correctness and adequacy of behaviors for attaining valued end states” (Ashford, 1986, p. 466; Ashford & Cummings, 1983). While feedback seeking was implicated as valuable to facilitate goal achievement, to discern the relative importance of goals, and to evaluate one’s own competence (Ashford & Cummings, 1983; Renn & Fedor, 2001), much of the feedback-seeking literature focuses on the influence of seeking feedback to improve job performance (e.g., task performance, supervisor ratings of performance; Anseel, Beatty, Shen, Lievens, & Sackett, 2015). Feedback seeking behaviors are categorized into two main strategies: inquiry and
monitoring (Ashford & Cummings, 1983). *Inquiry* involves directly asking another individual for feedback, while *monitoring* refers to observing others and the environment for cues as to one’s performance adequacy.

Under the assumption that seeking feedback is a beneficial way to gain information about performance, researchers sought to understand when and why individuals seek (or do not seek) feedback. Three motivations have been identified for seeking feedback: instrumental, ego protection, and impression management (Ashford & Cummings, 1983). The first, *instrumental*, refers to desiring feedback for the purpose of gaining information about one’s performance to reduce uncertainty, and is the motive most applicable to the current research.

Levy and colleagues argued that the feedback-seeking process is likely influenced by all three motivations at different stages, and that the context within which feedback seeking occurs also plays a role in the end result. For instance, Levy et al. (1995) found that an individual’s feedback seeking propensity is directly influenced by the privacy of the feedback-seeking context—the more private the environment, the more likely participants were to seek feedback, consistent with previous findings (Ashford & Northcraft, 1992). Williams et al. (1999) built on Levy et al. (1995) and found that when feedback is delivered publicly, but in a helpful way and in an environment with supportive peers, people sought more feedback. Furthermore, when the source providing feedback was supportive and created an impression of availability and comfort, and peers were pleased with their feedback, people sought as much feedback in a public context as they did in a private context. In fact, work on the feedback environment has routinely demonstrated that a favorable supervisor feedback environment is tied to employee
feedback seeking (e.g., Dahling et al., 2012; Steelman et al., 2004; Whitaker, 2011), and a recent meta-analysis found a moderate, positive relationship between the feedback environment and feedback inquiry (Anseel et al., 2015). Some findings suggest that the positive effects of the feedback environment on important outcomes are carried through increased feedback seeking (i.e., Whitaker et al., 2007), indicating that positive supervisor and co-worker feedback environments directly influence employee feedback-seeking behavior. Taken together these studies implicate both the supervisor and coworkers in creating an open environment supportive of feedback seeking.

Researchers have also examined the outcomes of feedback-seeking behavior. Ashford, Blatt, and Vandewalle (2003) argued that many of the outcomes of feedback seeking are the outcomes of feedback itself, namely, obtaining accurate information about other’s views of oneself, maintaining or enhancing image, and attaining instrumental goals. For example, Renn and Fedor (2001) demonstrated that feedback seeking improved performance by increasing goal-setting practices. Additionally, Garafano and Salas (2005) suggest that employees need to seek information to identify skill gaps, recognize areas to improve current performance, keep up with advances in their profession, and anticipate how changes elsewhere in the firm and the industry may affect work demands and skill requirements. Feedback seeking is clearly a valuable way for employees to gain perspective on their developmental needs and build career insight.

Although researchers have focused on studying motives for seeking feedback, the types of feedback sought, and the consequences of feedback seeking, this research has focused extensively on seeking feedback with job performance as the key outcome. A recent meta-analysis found a very small relationship between feedback seeking and
performance, and slightly stronger relationships between feedback seeking and several non-performance outcomes: job satisfaction, relationship building, networking, and socializing (Anseel et al., 2015). However, feedback seeking is explicitly useful as a tool to inform insight and self-awareness for broader developmental purposes (e.g., Garafano & Salas, 2005). For example, Devloo, Anseel, & De Beuckelaer (2013) found support for their hypothesis that managers use feedback seeking as a proactive way to cope with misalignments between the demands of their work and their capabilities.

As many organizations may direct managers to emphasize task-related performance feedback in formalized supervisor-employee interactions, employees may not regularly receive feedback that provides useful information about the development of competencies outside of the scope of those affiliated with specific tasks and the performance appraisal process. Feedback information is necessary as it provides insight into whether employees have developed the skills, abilities, and competencies required to take on future work opportunities, and facilitates self-development decisions (Hall & Mirvis, 1996). As a result, the best way for employees to get feedback on other skills or abilities may be to seek feedback from supervisors, peers, subordinates, or co-workers in a less formal setting. In fact, feedback seeking has been explicitly identified as a valuable self-management behavior in the career development literature as a way to define goals, take initiative to further development, and assess goal progress (e.g., Chiaburu, Baker, & Pitariu, 2006; Kossek, Roberts, Fisher, & DeMarr, 1998; London et al., 1999). When employees perceive that supervisors are available, deliver credible feedback, and are supportive of feedback seeking, consistent with a favorable supervisor feedback environment, employees may be more likely to seek feedback related to their broader
development goals. To this end, not only is feedback seeking useful for gaining perspective about job performance in organizations, but may be one way that the supervisor feedback environment indirectly influences employee career insight and perceptions of developmental need.

*Hypothesis 6: The supervisor feedback environment indirectly affects career insight through feedback seeking.*

*Hypothesis 7: The supervisor feedback environment indirectly affects perceived need for development through feedback seeking.*

**The Role of Individual Differences in the Feedback Environment-Self-Development Relationship**

As the work environment changed and employees began to behave in a more protean fashion, researchers and practitioners recognized the value of trait individual differences, in addition to contextual and environmental influences, that help employees more effectively use feedback to develop and help organizations retain talent and gain or maintain competitive advantage (Linderbaum & Levy, 2010). Lord and Levy (1994) introduced the notion that individual differences may affect the extent to which individuals are capable of directing attention and self-regulating behavior from a control theory perspective, as some differences between people increase or decrease their ability to find, use, and adequately process information about themselves and their environment. Investigating the individual characteristics that may serve to direct attention towards developmental gaps or facilitate the resolution of those gaps can benefit research and practice in self-development. Although the primary goal of the proposed study is to investigate the role of the environment in self-development participation, consistent with
previous research and theory on self-development (e.g., London & Smither, 2002; McCauley & Hezlett, 2002; Orvis & Leffler, 2011), the individual differences that potentially influence the relationship between the feedback environment and self-development are included in order to develop a more comprehensive understanding of the boundary conditions of the feedback environment as a form of organizational support for self-development (e.g., Gabriel et al., 2014).

**Feedback Orientation**

*Feedback orientation* refers to “an individual’s overall receptivity to feedback and the extent to which the individual welcomes guidance and coaching” (London & Smither, 2002, pp. 82-83). Feedback-oriented individuals typically like feedback, seek feedback, process feedback mindfully, have a sensitivity to others’ perceptions of themselves, believe in feedback’s value for increasing personal effectiveness, and a have strong sense of accountability to use feedback (London & Smither, 2002). Collectively, feedback orientation reflects an individual’s general propensity to thoroughly use feedback in order to improve performance, making it an important individual difference construct in performance management research (Dahling et al., 2012; Linderbaum & Levy, 2010; London & Smither, 2002).

Individuals with a strong feedback orientation should be more comfortable receiving, processing, and using feedback than individuals who are not feedback oriented (Ilgen et al., 1979; Linderbaum & Levy, 2010; London & Smither, 2002). First, feedback-oriented individuals are more open to *receiving* feedback and better able to control their emotional reactions to feedback. Second, feedback-oriented individuals are more thorough and thoughtful in *processing* feedback prior to acting on it. Third,
individuals with a strong feedback orientation are more likely to use feedback and to do so effectively to improve performance, because they see utility in and have self-efficacy for dealing with feedback.

Feedback orientation is considered a quasi-trait, meaning individuals likely inherently differ in their receptivity to feedback (Dahling et al., 2012; De Shon & Gillespie, 2005), but an individual’s feedback orientation could change over long periods of time (London & Smither, 2002).

Feedback orientation is advantageous for performance change and development (e.g., London & Smither, 2002), and its empirical value has been established in several recent studies through the development of the Feedback Orientation Scale (FOS; Linderbaum & Levy, 2010). The FOS measures an individual’s propensity to value feedback via four dimensions: accountability, utility, feedback self-efficacy, and social awareness. The utility dimension assesses the tendency to believe feedback is useful for achieving goals or getting desired outcomes at work. Accountability items assess an individual’s tendency to feel obligated to act on feedback. Feedback self-efficacy measures an individual’s tendency to feel confident dealing with feedback. Finally, social awareness refers to whether an individual uses feedback to be aware of and sensitive to other people’s views of themselves. Based on this conceptualization, feedback orientation is likely helpful for explaining individual differences in adequately processing discrepancies between goals and standards and in acting on that information by developing appropriate strategies to resolve discrepancies (Lord & Levy, 1994).

In their study establishing the validity of the FOS, Linderbaum and Levy (2010) found positive relationships between components of feedback orientation and several
constructs related to employee development. For example, the four dimensions were positively related to intention to use feedback, to feedback seeking behavior, and to role clarity. Additionally, in terms of the relationship with development-related outcomes, an overall FOS score and the accountability and social awareness dimensions were positively related to self-rated participation in development, while feedback self-efficacy was positively related to supervisor ratings of employee development. The feedback self-efficacy dimension also provided incremental validity over general self-efficacy and locus of control in predicting participation in development. Employees high in feedback orientation are more likely to seek feedback, to intend to use feedback, and to participate in development than employees who are low in feedback orientation (Linderbaum & Levy, 2010).

Because a measure of the construct has only recently been developed and published, few studies have examined performance-related outcomes of feedback orientation. Dahling et al. (2012) examined correlates and consequences of employee feedback orientation. They found an indirect relationship between feedback orientation and supervisor assessment of performance through self-rated feedback seeking, suggesting that employee feedback orientation positively influences supervisor ratings of employees’ performance as employees seek more feedback from their supervisors about performance. Feedback-oriented individuals are perceived as seeking more feedback from supervisors, and employees who seek more feedback have higher performance ratings.

Noting previous studies used only single source data (i.e., Linderbaum & Levy, 2010) or data collected at a single time point (i.e., Dahling et al., 2012; Linderbaum &
Levy, 2010), Braddy et al. (2012) sought to provide further predictive validity for the FOS by exploring longitudinal effects of feedback orientation in a leadership development context. Prior to attending a development workshop, leaders completed the FOS, and 360° feedback data were collected on their behalf from their employees. During the training, the leaders participated in a one-on-one coaching session where their 360° feedback was presented to them by a coach, who then rated each leader on openness to feedback, likelihood to change in the future, and defensiveness with regard to feedback.

Overall, feedback-oriented leaders were more likely to have positive reactions to the 360° feedback. Braddy et al. (2012) found no evidence that feedback orientation was related to leader effectiveness measured via the 360° assessment; however, the utility dimension of feedback orientation was predictive of coaches’ perceptions of a leader’s likelihood to change in the future. This suggests that individuals who find feedback useful may be viewed by others as more likely to change, even if they have not actually made behavioral improvements yet, and even when feedback orientation is unrelated to current leader performance. Thus, valuing feedback seems to influence others’ perceptions of an individual’s potential to change. However, as feedback orientation was self-reported by participants, and not rated by the coaches, it is difficult to conclude that the coaches’ perceptions of leader feedback orientation had any effect. Unfortunately, the researchers did not collect subsequent development or performance data, so the perception that feedback-oriented individuals may be more likely to develop later has yet to be empirically tested. Braddy et al. (2012) concluded that although extant research has demonstrated the usefulness of feedback orientation as an individual difference construct,
future research needs to examine whether feedback orientation is related to actual actions taken by individuals to improve performance.

Feedback Orientation and Self-Development

Braddy et al. (2012) was the first study to examine feedback orientation in a developmental context, but extant research has focused almost exclusively on understanding how feedback orientation operates in relation to job performance. Although the previously reviewed studies demonstrate the conceptual utility of feedback orientation, no one has addressed feedback orientation as relevant to actual participation in self-development, an activity that can be used to improve performance for current and future jobs. Feedback orientation is valuable to organizations because feedback orientation is influential in accurately receiving, interpreting, and using feedback to improve performance (Linderbaum & Levy, 2010; London & Smither, 2002). Additionally, employees with awareness of their skills, abilities, goals, and values may more effectively self-manage development, which can relieve managers of some performance management burdens (DeVos & Soens, 2008; London, 1983; Maurer & Tarulli, 1994). Being open to receiving and committed to using feedback to address performance strengths and weaknesses seems to influence others’ perceptions of likelihood to improve in the future (Braddy et al., 2012). Feedback-oriented individuals see feedback as a valuable resource for improvement and goal achievement, use feedback to better understand how others see them and their work, feel more confident acting on feedback, and more accountable to use feedback (Linderbaum & Levy, 2010). It is reasonable, then, to expect that employee feedback orientation influences the supervisor feedback environment-self-development relationship in three ways: by strengthening the
effect of the feedback environment on feedback seeking, on career insight and need for development, and by strengthening the likelihood that career insight and need for development translate into self-development.

**Feedback Orientation as a first stage moderator.** A favorable supervisor feedback environment is characterized by feedback that is widely available, credible, encouraging, and includes both positive and negative feedback. In a favorable feedback environment, individuals should be more likely to seek and use feedback, to become increasingly aware of their capabilities and how others perceive them, and aware of what they may need to do in the future to achieve their goals (Linderbaum & Levy, 2010; London & Smither, 2002; Steelman et al., 2004). Gabriel et al. (2014) found that the supervisor feedback environment was only empowering to feedback-oriented employees, and a favorable supervisor feedback environment actually harmed competence and self-determination for employees who lacked the favorable attitude towards feedback. Thus, highly feedback-oriented individuals should be more comfortable than those with a low feedback orientation when it comes to seeking feedback, as well as taking feedback from the environment and using it to inform their own perceptions of their need for development and building a better understanding of their career interests. With regards to the effect of the supervisor feedback environment on feedback seeking (established by Whitaker et al., 2007), it is anticipated that feedback orientation will moderate this relationship in a fashion very similar to the interaction reported by Gabriel and colleagues. When the supervisor feedback environment is favorable, individuals with a stronger propensity to seek, value, and use feedback are more likely to seek feedback, than employees who lack this predisposition. Alternatively, a favorable supervisor
feedback environment may actually be threatening to individuals low in feedback orientation, as the increased availability of feedback becomes too difficult to process, resulting in a decreased tendency to seek feedback. That is:

*Hypothesis 8: The positive relationship between supervisor feedback environment and feedback seeking is moderated by feedback orientation, such that individuals with higher feedback orientations will show stronger, positive relationships between the supervisor feedback environment and feedback seeking, while individuals with lower feedback orientations will exhibit weaker, or even negative relationships between the supervisor feedback environment and feedback seeking.*

A favorable supervisor feedback environment is expected to positively relate to both career insight and need for development, as the widely available, accurate, and credible feedback enhances employees’ understanding of the demands of career goals and awareness of their developmental needs. For feedback-oriented individuals, the positive relationships should become stronger and more positive because they value feedback and use it to understand how other people view them on the job. Individuals with a weak feedback orientation are less likely to see value in feedback and to apply it in order to understand how their supervisors view them. As a result, the availability of feedback in the environment may not influence the extent to which these individuals have strong career insight, or perceive areas of developmental need. The relationship between a favorable supervisor feedback environment and both career insight and developmental need may be weak or nonexistent for individuals with very low feedback orientation. In other words:
Hypothesis 9: The positive relationship between supervisor feedback environment and career insight is moderated by feedback orientation, such that individuals with higher feedback orientations will show stronger, positive relationships between the supervisor feedback environment and career insight, while individuals with lower feedback orientations will exhibit weaker, or non-significant relationships between the supervisor feedback environment and career insight.

Hypothesis 10: The positive relationship between supervisor feedback environment and need for development is moderated by feedback orientation, such that individuals with higher feedback orientations will show stronger, positive relationships between the supervisor feedback environment and need for development, while individuals with lower feedback orientations will exhibit weaker, or non-significant relationships between the supervisor feedback environment and need for development.

Feedback orientation as a second stage moderator. Feedback-oriented individuals see value in feedback as a critical tool for achieving goals, and feel more accountable to respond to feedback and apply it to improve performance (Linderbaum & Levy, 2010; London & Smither, 2002). This personal characteristic likely affects employees’ tendency to act on information gathered via feedback. Employees with career insight and who are aware of their developmental needs are more likely to participate in self-development because they have a greater understanding of the demands of their goals, and recognize what needs to be done to achieve them (Maurer & Tarulli, 1994; Maurer et al., 2003). When that knowledge has been informed by feedback, as hypothesized, it stands to reason that feedback-oriented employees likely see the information as valuable and feel a responsibility to act on it. As a result, the relationship
between career insight and self-development may be strengthened by a strong feedback orientation. Alternatively, individuals with a weak feedback orientation may not feel the same accountability to act on feedback, and may not value the feedback to begin with. These individuals may be less likely to act on career insight or on the perception of a developmental need by engaging in self-development. Taken together, it is hypothesized that:

**Hypothesis 11:** The positive relationship between career-insight and self-development is moderated by feedback orientation, such that low feedback orientation reduces the effect of career insight on self-development.

**Hypothesis 12:** The positive relationship between need for development and self-development is moderated by feedback orientation, such that low feedback orientation reduces the effect of need for development on self-development.

**Protean Career Attitude**

A second individual difference variable that likely influences the effect of the supervisor feedback environment on self-development is a protean career attitude. Hall (2002) defined the *protean career attitude* as reflecting an individual’s tendency to manage his or her career in a pro-active, self-directed way. Individuals with a PCA experience greater responsibility for managing their career opportunities, and importantly, do so using their sense of identity as an internal decision making guide. Briscoe et al. (2006) defined a protean attitude as characterized by self-directed career management and an emphasis on personal values driving careers. DeVos and Soens (2008) indicate that “additionally, [PCA] is conceived to set the basis for individual career management initiatives which might include both the development of learning
about one self (acquiring career insight), and taking practical initiatives to manage one’s career” (p. 450). In line with Hall and Mirvis (1996), these authors suggest that a protean attitude is important for having good insight and taking action towards development.

Although publications on protean career theory date back to the 1970s, empirical work testing the implied hypotheses was nonexistent until the 21st century and the publication of the protean career attitude measure (Briscoe et al., 2006). As a result, the major tenets of the theory were untested for decades. Because individuals with a protean career attitude feel greater responsibility for their own career opportunities, a protean attitude provides the foundation for career management actions, including acquisition of self- and career insight, and taking actions to drive one’s career (DeVos & Soens, 2008).

Briscoe and colleagues (2006) developed and validated a measure of protean career attitude that includes two dimensions: *self-directed*, referring to an individual tendency to take an independent role in managing vocational behavior, and *values-driven*, referring to the use of internal values as a guide for decision making. Across three studies using undergraduate, MBA student, and executive employee samples, Briscoe et al. (2006) found that a protean career attitude was positively associated with openness to experience, mastery learning goal orientation, proactive personality, and authenticity. The three samples had similar means and standard deviations on the self-directed scale of protean career attitude, suggesting that the attitude is similarly distributed within the three populations, regardless of career stage. Briscoe et al. (2006) provided a way to measure protean attitude and began establishing its nomological network, placing protean career attitudes in the context of other psychological constructs; however, the study did not link
a protean career attitude to vocational behavior, leaving questions about the relationship between having a protean career attitude and important work outcomes unanswered.

DeVos and Soens (2008) were the first to demonstrate that protean career attitude related to important protean career outcomes by way of actions associated with protean theory: career insight and self-management behavior. Specifically, they argued that two career success outcomes, perceived employability and career satisfaction, were indirectly affected by protean career attitude via a behavioral route (i.e., self-management behaviors) and a reflective route (i.e., career insight). Data from a sample of Belgian employees who had recently participated in career counseling partially supported the hypothesized model: although having a protean career attitude had a strong direct effect on both career insight and self-management behaviors, only career insight affected perceived employability and career satisfaction. Thus, the indirect effect of a protean career attitude on both outcomes was carried exclusively through career insight. DeVos and Soens (2008) suggest that, “by separating the more reflective aspect of self-management from the behavioral aspect, it appears that the latter is in itself, not sufficient for career success” (p. 455). Simply, employees need career insight to guide their development behavior.

In an effort to understand how career attitudes affected job behavior during a turbulent employment period, Briscoe and colleagues (2012) collected data during the period of employment instability immediately following the Great Recession in 2008. The authors were explicitly interested in examining the self-directed component of protean career attitude and a second career attitude, boundaryless career mindset, which is defined by exploring career opportunities and seeking relationships. Boundaryless
career mindset is one of two dimensions associated with the boundaryless career, a conceptual cousin of the protean career (Briscoe et al., 2006). Briscoe et al. (2012) expected that self-directed protean career attitude would positively relate to job performance, career success, and psychological wellbeing through becoming more aware of one’s identity and actively coping with change, as these behaviors are closely linked to the self-directed protean career attitude.

The fully-mediated model received partial support: self-directed protean career attitude was associated with more active coping behaviors, and subsequently to better performance, career success, and unexpectedly, to decreased psychological well-being, while identity awareness was a mediator of the self-directed- psychological well-being relationship only. Protean career attitude also displayed an unexpected direct effect on all three outcomes, providing the first evidence that having a self-directed protean attitude is directly related to higher job performance, greater career success, and decreased psychological wellbeing. As a whole, Briscoe et al.’s (2012) findings contribute to the literature by empirically demonstrating that protean attitudes benefit employees by encouraging active coping with changes and reflection on career-related identity. They concluded that “self-directed protean attitudes are more internally focused, facilitating self-exploration that enables individuals to attend to identity issues” (p. 314).

Acknowledging previous research, it is expected that a self-directed protean attitude facilitates self-evaluation and actively coping with change, both of which are necessary processes in the development of career insight and knowledge of developmental needs. Previous research has already established that a protean career
attitude is positively related to career insight (Briscoe et al., 2012). In line with this finding, it is expected that:

*Hypothesis 13: Self-directed protean career attitude positively relates to career insight.*

Self-directed protean career attitude should also affect whether or not employees act on the perception of developmental need. A core difference between proteans and non-proteans is their self-directed nature (Hall & Mirvis, 1996). Because individuals with a PCA feel responsible for their success and in charge of their career, they should be more likely to act when they perceive a need to develop that may influence their career goals by engaging in self-development.

*Hypothesis 14: The relationship between perceived need for development and self-development is moderated by protean career attitude, such that the relationship will be stronger and positive for those higher in self-directed protean career attitude, and weaker or non-existent for employees low in self-directed protean career attitude.*

**The Conditionality and Coexistence of Indirect Effects**

Collectively, employee feedback orientation and protean career attitude are expected to play a moderating role in the supervisor feedback environment-self-development relationship by altering the effect of the three mediating constructs: feedback seeking, career insight, and need for development. It is unlikely that these mediating and moderating effects occur in isolation. That is, the proposed indirect effects of the supervisor feedback environment on self-development may be altered by the proposed moderated effects. However, as the specific hypothesized relationships developed from a review of the literature in the present study have yet to be empirically
tested, it is conceptually valuable to understand these bivariate, mediated, and moderated relationships in isolation first, and then examine how these variables behave when modeled simultaneously. Doing so allows for the present study to support the development of theory or practice applications based on the hypothesized relationships between variables in the model, and still investigate the effects of the supervisor feedback environment on self-development taking all of the effects specified previously into consideration at once. Because these complex relationships can be modeled in many different ways, I propose two research questions that allow for some flexibility in the modeling based on the results of the hypotheses presented previously, consistent with the approach suggested by Hayes (2013).

Specifically, several processes are implied in the model depicted in Figure 1.1 that provide a more comprehensive picture of the effect of the supervisor feedback environment on self-development, but have not been directly hypothesized. First, the effect of the supervisor feedback environment on self-development is proposed to occur through three mediating variables, two operating in parallel (i.e., at the same time: career insight and need for development), and a third, feedback seeking, expected to affect the two parallel mediators by carrying some of the effect of the supervisor feedback environment, (i.e., operating in serial). As hypothesized, these effects are examined independently; however, the effect of the supervisor feedback environment on self-development may happen through all three mechanisms at once, to varying degrees. That is, the supervisor feedback environment likely affects career insight and need for development directly, as well as indirectly through feedback seeking, and greater career insight and perceived need for development are associated with higher levels of self-
development, as implied by the conceptual model. To the extent that any of these indirect effects occur, it may be valuable to estimate models that allow for the mediators and their effects to be estimated in conjunction with one another. Hayes (2013) template Models 4 and 6 estimate multiple mediators in parallel and in serial, and can answer the following research question:

Research Question 1: What are the direct, indirect, and total effects of supervisor feedback environment on self-development, considering the mediating variables together?

Second, employee individual differences (i.e., feedback orientation, protean career attitude) may alter the relationship between the supervisor feedback environment and employee self-development behavior. Hypotheses 8-12 and 14 address how feedback orientation and protean career attitude affect individual bivariate relationships depicted in Figure 1.1. However, it is reasonable to expect that the moderated nature of some of these relationships could affect whether or not the mediated effects hypothesized in Figure 1.1 occur. That is, the indirect effects hypothesized may be conditional upon these individual difference characteristics.

Specifically, feedback orientation is expected to alter both the relationships between supervisor feedback environment and career insight and need for development, and the relationships between career insight and need for development and self-development behaviors, as stated in Hypotheses 8-12. By examining the mediated path as a whole, rather than as separate pieces, it may be discovered that the indirect effect of supervisor feedback environment on self-development via greater career insight and need for development is actually dependent upon the extent to which employees are feedback
oriented. Similarly, a protean career attitude is hypothesized to affect the relationship between need for development and self-development. However, it is plausible that the moderation of this path influences whether or not there is an observed indirect effect of supervisor feedback environment on self-development through need for development. That is, the indirect effect may be contingent upon having the “right” strength of protean career attitude.

*Research Question 2: Are the hypothesized indirect effects of the supervisor feedback environment on self-development conditional upon feedback orientation and/or protean career attitude?*
CHAPTER III

METHODOLOGY

Participants

Amazon’s Mechanical Turk (MTurk) was used to recruit participants for this study. MTurk is an online human subject pool designed to permit qualified individuals to complete work tasks called Human Intelligence Tasks (HITs). MTurk has been used for research in many areas such as organizational psychology (Chua, 2013; Mor, Morris, & Joh, 2013), cognitive psychology (Crump, McDonnell, & Gurekis, 2013; Eriksson & Simpson, 2011), social psychology (Fishbach, Henderson, & Koo, 2011; Gomez, Brooks, Buhrmester, Vasquez, Jetten, & Swann, 2011), economics (Horton, Rand, & Zeckhauser, 2011), and linguistics (Sprouse, 2011). In addition to being convenient, MTurk provides a way to more expediently access a diverse sample of participants, compared to the pool of employed undergraduates often used in convenience sample-based research (Buhrmester, Kwang, & Gosling, 2011; Johnson & Borden, 2012; Paolacci, Chandler, & Ipeirotis, 2010). MTurk also allows researchers to reject MTurk workers' HIT submissions if the product is not of a certain quality, providing more control over data quality on the front end of data collection than typically available in an undergraduate sample (Mason & Suri, 2012).
For Institutional Review Board purposes, all participants were at least 18 years of age. To maintain data quality, participants were required to be from the United States and to have a 95% approval rating or better from previous MTurk assignments. Additionally, items that were designed to assess respondents’ attention and identify cases of insufficient effort responding (see Huang, Curran, Keeney, Poposki, & DeShon, 2012 and Huang, Liu, & Bowling, 2015) were inserted throughout the measures based on the advice of Meade and Craig (2012). Participants who incorrectly responded to more than 3 items were removed from the study. This criterion was explicitly outlined in the informed consent and in the description of the task provided to MTurk workers prior to selecting to participate in the HIT.

Previous research has suggested that at least 300-400 respondents would be necessary to detect moderation and mediation (Hayes, 2013; Fritz & MacKinnon, 2007). To recruit participants, the HIT was posted with the aforementioned qualifications and a pre-screening survey was included prior to reaching the start of the survey. Participants had to work at least 25 hours per week, not be self-employed nor primarily work via MTurk for a living, have a direct supervisor and co-workers, and needed to have worked for their present supervisor for at least 2 years in order to participate.

In all, 1006 people accessed the survey on Qualtrics via MTurk. Of those, 527 passed the pre-screening and were able to access the study measures. An additional 49 people were removed from the data set who passed the screening, but did not complete the survey measures, and 12 people were removed for failing more than 3 attention check items designed to detect insufficient effort responding (Huang et al., 2015). Finally, 44 participants were removed during a data quality check for passing the pre-screening, but
answering subsequent questions in a manner suggesting they did not actually meet the
criteria for the study or were not paying attention (e.g., agreeing to “I do not have a
supervisor, manager, or boss at work”, reporting a tenure less than 2 years with present
supervisor, or selecting “I am not employed” in demographic criteria). The final data set
consisted of 422 respondents.

These individuals were predominately white (80.8%, African American/Black = 7.8%,
Asian = 4.7%, Hispanic/Latino(a) = 4.5%), female (60.3%, male = 39.7%) and
working for organizations with under 500 employees (69.6%) and in the private, for-
profit sector (for profit = 72.3%, private non-profit = 11.1%, government = 16.3%). The
majority had at least a 4-year college degree (36.3%, master’s degree = 15.4%, doctoral
degree = 1.2%, professional degree = 1.4%), and a smaller proportion had some college
(22%) or a 2-year college degree (14.9%). Only 8.8% of the participants had no college
education. Participants ranged in age from 20 to 70 years of age ($M = 37.45, SD = 11.17$),
and they were employed anywhere from 25 hours to 90 hours per week ($M = 40.92, SD =
7.26$). On average, participants had worked for their current organization 6.72 years ($SD
= 4.97$), and had anywhere from 2 to 19 years of tenure with their current supervisor ($M =
4.71, SD = 3.13$).

**Procedure**

Each individual who met the MTurk qualifications and elected to participate
completed the pre-screen and measures for study online via Qualtrics. After reading a
description of what the HIT entailed on the MTurk page, they were directed to click a
link that opened the survey materials on Qualtrics in a separate browser window. The
first screen provided the Informed Consent form and asked that they provide consent by
clicking an appropriate button. Anyone who did not consent was redirected out of the Qualtrics survey. Those who consented to participate in the task were presented with a series of pre-screen questions that confirmed their eligibility to participate in the study. If a participant was not eligible, he or she was automatically redirected out of the survey and asked to return the HIT to avoid penalty on MTurk. Doing so limited the number of people completing the survey materials who would ultimately not be included in the study without penalizing MTurk workers by lowering their approval ratings. Those who met qualifications were able to see instructions for the survey measures described below.

After completing the survey, participants were offered the opportunity to provide supervisor contact information, but informed that this was not necessary for payment and completely voluntary. Interested participants provided their first name and last initial, direct supervisor’s first name, last initial, email address, and mailing address so that the supervisor could be contacted with a request to complete the supervisor materials for their employee. The employee participants were notified that their supervisor would never see the employee’s responses, and would not be informed that the employee participated in the study for payment via MTurk. Employee participants were advised that their supervisor would receive an email indicating that the employee participated in a study, and referring the supervisor to a separate Qualtrics link to complete the supervisor materials. The employee’s name was only included so that the supervisor knew which direct report to reference when responding to survey items.

After confirming that the participating employee’s data met inclusion criteria, an invitation to complete the supervisor portion of the study was sent to the participating employee’s supervisor via email. A total of 24 respondents provided the voluntary
supervisor contact information; however, only 15 participants (3.5% of the study sample) passed the data checks and were included in the study. An email invitation was sent to those 15 supervisors, and 5 completed the survey for a response rate of 33.3% for those invited. Unfortunately, with only 5 paired responses (less than 1% of the sample), supplementary analyses using supervisor data were not sufficiently powered and, therefore, this measure will no longer be discussed as no analyses could be conducted. A summary of the measures completed by employees and supervisors is included in Table 3.1 at the conclusion of this chapter.

Measures

After a thorough review of the literature and discussion with the committee, the following measures were employed to assess the constructs described in the present study:

Employee Demographic Information

Employees provided demographic and job-related information. Demographic items included questions about race/ethnicity, sex, age, and education level. Job-related items included questions about tenure (both with current organization and with the specified supervisor/employee), organization characteristics, and job title.

Supervisor Demographic Information

Supervisors provided demographic and job-related information about themselves. Demographic items included questions about race/ethnicity, sex, age, and education level. Job-related items included questions about tenure (both with current organization and with the specified employee), organization characteristics, and job title.
Feedback Environment Scale

The quality of the supervisor feedback environment was measured using a modified version of the supervisor portion of the Feedback Environment Scale (FES; Steelman, Levy, & Snell, 2004). The FES consists of 7 facets measured using a 5-point Likert scale where 1 = “Strongly Disagree” and 5 = “Strongly Agree”. Internal consistency reliability estimates are all within acceptable ranges: source credibility (5 items, $\alpha = .87$), feedback quality (5 items, $\alpha = .92$), feedback delivery (5 items, $\alpha = .84$), favorable feedback (4 items, $\alpha = .93$), unfavorable feedback (4 items, $\alpha = .81$), source availability (5 items, $\alpha = .77$), promotes feedback seeking (4 items, $\alpha = .75$). The measure asks respondents to consider their entire tenure with their present supervisor and to rate the extent to which they agree or disagree with statements about the environment. A sample item is “My supervisor has been supportive when giving me feedback about my job performance.” The mean of all items was calculated and used as a single score representation of the supervisor feedback environment, and had acceptable internal consistency ($\alpha = .95$).

Feedback Orientation

Feedback orientation was measured using the Feedback Orientation Scale (FOS; Linderbaum & Levy, 2010). FOS contains 4 dimensions, each measured with 5 items on a 1-5 Likert scale, where 1 = “Strongly Disagree” and 5 = “Strongly Agree.” All dimensions demonstrated acceptable internal consistency reliability estimates: utility, $\alpha = .90$, accountability, $\alpha = .75$, social awareness, $\alpha = .88$, and self-efficacy, $\alpha = .84$. As with the supervisor feedback environment, a single mean score was calculated for the entire
FOS, with an observed internal consistency of .91. An example item is: “It is my responsibility to apply feedback to improve my performance at work.”

**Self-Directed Protean Career Attitude**

Self-directed attitude was measured using 8 items from the Protean Career Attitude scale (Briscoe et al., 2006), measured on a 7-point Likert scale indicating the extent to which the respondents considered themselves as primarily responsible for managing careers (ex: “I am in charge of my own career”). The internal consistency reliability estimate in the present study ($\alpha = .86$) was acceptable.

**Career Insight**

Career insight was measured using 5 items from London’s (1993) Career Motivation Scale. Participants were asked to rate the extent to which each of the 5 items applies to him or herself or to the employee he or she supervises using a 5-point scale where 1 = low and 5 = high. Internal consistency reliability estimates for this subscale were acceptable for employee self-reports ($\alpha = .83$). A sample item is “Please rate the extent to which you have clear career goals.”

**Need for Development**

Need for development was assessed using a measure containing 3 items from Maurer and colleagues (1994; 2003), measured on a 5-point response scale ranging from 1 (strongly disagree) to 5 (strongly agree). The measure’s internal consistency was .89. A sample item is “One or more areas of my career-related skills or knowledge have been in need of improvement.”
Self-Development

Employees’ self-reported participation in developmental activities was measured using Orvis & Leffler’s (2011) developmental checklist. Participants were asked to consider the last 12 months and report the number of times they participated in each of the 19 activities listed (0 = never, 6 = 6+ times). Sample items include “Voluntarily worked to learn a new skill on the job” and “Tried to improve a specific attribute of myself while I was doing the work required of my job.” The participation count was summed across all 19 items for a single score used in further analyses. The internal consistency of self-development scale was .89 in the present study.

Feedback Seeking

Feedback seeking was measured using a 4-item scale constructed by Whitaker (2007). Four items representing general feedback seeking were based on Williams and Johnson’s (2000) feedback seeking measure, which assessed the frequency with which subordinates directly seek feedback from their supervisors (2 items) and coworkers (2 items). A sample item is “How often do you ask your supervisor for information about what is required of you to function successfully on the job?” Responses were measured on a six-point scale ranging from 1 (never) to 6 (always), and had acceptable internal consistency (α = .82).

Perceived Organizational Support

The employee’s perception of the support provided by the employing organization was assessed using two measures. First, the Survey of Perceived Organizational Support short form by Eisenberger, Huntington, Hutchison, and Sowa (1986) assessed perceptions of global organizational support. This scale contained 17 items assessed using a 7-point
Likert scale (1 = strongly disagree, 7 = strongly agree) with a strong internal consistency ($\alpha = .97$). A sample item is “Help is available from the organization when I have a problem.” Second, the perception of work support specifically aimed at employee development was assessed using 29 items from Maurer et al. (2003), measured on a 7-point Likert scale (1 = disagree very strongly, 7 = agree very strongly). This scale includes items that assess co-worker support (10 items, $\alpha = .93$), supervisor support (11 items, $\alpha = .94$), and development-oriented work policies and availability of learning and development resources (8 items, $\alpha = .89$). Maurer et al. (2003) found strong correlations among the scales and instead combined the items into a single scale (29 items, $\alpha = .96$). A few sample items include “My coworkers believe that learning and training activities are important,” “My supervisor is supportive of my efforts to improve my work skills,” “The policies and work rules where I am employed make it possible to participate in career-related learning and development activities,” and “My employer emphasizes employee learning to its employees.”

**Analytic Strategy**

To test Hypotheses 1, 2, and 13, which predicted positive relationships between focal variables, bivariate correlations between the hypothesized variables were calculated at the $p < .05$ level of significance first. To address the remaining hypotheses and research questions that indirect effects and moderating effects, the corresponding statistical models were estimated using the PROCESS macro (Hayes, 2013). PROCESS is an add-on for SPSS that uses ordinary least squares regression to estimate direct and indirect effects in mediator models, two and three-way interactions, simple slopes for interactions, and conditional indirect effects. Additionally, PROCESS calculates bias-
corrected Bootstrapped confidence intervals and estimates various measures of effect size. The macro functions by allowing the user to specify a model using one of the templates provided, and then estimates effects using equations corresponding to paths in the specified model.

Hypotheses 3, 5, 6, and 7 that posited indirect effects were evaluated by estimating the direct and indirect effects using Hayes (2013) template Model 4 for PROCESS (Hayes, 2013). PROCESS uses a products of coefficients strategy that estimates the size of an indirect effect of an independent variable on a dependent variable through a mediator, and also calculates the estimated direct and total effects of the independent variable on the dependent variable. This method is considered superior to the causal steps method (i.e., Baron & Kenny, 1986) as it permits estimating relationships without making assumptions about the normality of the sampling distribution by bootstrapping sampling distributions and using confidence intervals to determine whether the indirect effect is different from zero (Preacher & Hayes, 2008), which would support the hypothesis that an indirect effect exists. Unless otherwise noted, all confidence intervals were set to 95% and calculated using 10,000 bias corrected bootstrapped samples. Additionally, for the indirect effect estimates, Preacher and Kelley's (2011) kappa squared ($\kappa^2$) measure of effect size was examined, which expresses the magnitude of the indirect effect in terms of a ratio to the maximum possible indirect effect that could have been found. A small $\kappa^2$ value is 0.01 or smaller, whereas 0.09 is considered medium, and a large effect is 0.25 or higher (Preacher & Kelley, 2011). Hypotheses proposing simple, single moderator effects (i.e., 8, 9, 10, 11, 12, and 14) were estimated using template Model 1 (Hayes, 2013). Hypotheses were supported if the Bootstrapped
confidence interval for the hypothesized interaction term did not contain zero. Unless otherwise noted, all confidence intervals were calculated using a 95% confidence level. Where moderation existed, the Johnson-Neyman (J-N) technique was utilized to further characterize the nature of any significant interactions, as this technique identifies values of the moderator variable where the effect of the predictor on the outcome changes from statistically significant to nonsignificant. This is consistent with the conceptualization of a moderator as a variable that changes the relationship between two variables, and is clear if the relationship changes from significant to nonsignificant as a function of the moderator. Finally, models with significant interaction terms were plotted in order to visualize the nature of the conditional relationship for the supported hypothesis.
Table 3.1. Measures and measurement sources in the present study.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measure</th>
<th># of Items</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor Feedback Environment</td>
<td>REVISED Feedback Environment Scale (Steelman, Levy, &amp; Snell, 2004)</td>
<td>32</td>
<td>Employee</td>
</tr>
<tr>
<td>Organizational Support</td>
<td>Perceived Organizational Support (Eisenberger, Huntington, Hutchison, &amp; Sowa, 1986)</td>
<td>17</td>
<td>Employee</td>
</tr>
<tr>
<td></td>
<td>Work Support for Development (Maurer, Weiss, &amp; Barbeite, 2003)</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Career Insight</td>
<td>London (1993) Career Motivation Scale - Insight subscale</td>
<td>5</td>
<td>Employee and Supervisor</td>
</tr>
<tr>
<td>Perceived Need for Development</td>
<td>(Maurer &amp; Tarulli, 1994; Maurer, Weiss, &amp; Barbeite, 2003)</td>
<td>3</td>
<td>Employee</td>
</tr>
<tr>
<td>Feedback Orientation</td>
<td>Feedback Orientation Scale (Linderbaum &amp; Levy, 2010)</td>
<td>20</td>
<td>Employee</td>
</tr>
<tr>
<td>Protean Career Attitude</td>
<td>Self-Directedness subscale of Protean Attitude Scale (Briscoe et al., 2006 as used by De Vos &amp; Soens, 2008)</td>
<td>8</td>
<td>Employee</td>
</tr>
<tr>
<td>Self-Development</td>
<td>Development Checklist (Orvis &amp; Leffler, 2011; adapted from Maurer et al. 2003)</td>
<td>19</td>
<td>Employee</td>
</tr>
<tr>
<td>Formal Development</td>
<td>Participation in Formal Development Activities</td>
<td>6</td>
<td>Supervisor</td>
</tr>
<tr>
<td></td>
<td>Kraimer, Seibert, Wayne, Liden, &amp; Bravo (2011)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demographics</td>
<td>Age, ethnicity, gender, education level, job title, job function, industry, tenure with current super/sub, hours/week, tenure with current organization.</td>
<td>10</td>
<td>Employee and Supervisor</td>
</tr>
<tr>
<td>Job Performance</td>
<td>Williams &amp; Anderson (1991)</td>
<td>7</td>
<td>Supervisor</td>
</tr>
</tbody>
</table>
CHAPTER IV

RESULTS

Means, standard deviations, and correlations for focal and demographic variables are presented in Table 4.1. A review of the relationship between demographic variables and focal variables demonstrated largely inconsistent or non-significant patterns with the exception of age, gender, and hours worked per week. Age was significantly and negatively correlated with three focal variables (need for development $r = -.12, p < .05$; feedback orientation $r = -.14, p < .05$; feedback seeking $r = -.14, p < .05$) such that older employees had lower scores as compared to younger employees.

For gender, the relationships presented in Table 4.1 suggest slight but significant differences between men (coded as 1) and women (coded as 2) for several focal variables. Specifically, men worked more hours per week ($r = -.26, p < .01$), were more likely to seek feedback ($r = -.16, p < .01$), reported greater perceived need for development ($r = -.13, p < .01$), reported increased participation in self-development ($r = -.12, p < .05$), and reported stronger feedback orientation ($r = -.10, p < .05$) than did women in the sample. For hours worked, reported by participants as the average number of hours they worked per week for their current job, Table 4.1 shows a small but positive relationship between hours and several focal variables, indicating working more hours.
Table 4.1. Means, standard deviations, and correlations of variables in the present study.

|                | Mean | SD  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|----------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Age            | 4.76 | 1.17| --- |     |     |     |     |     |     |     |     |     |     |
| Race/Ethnicity | 2.91 | 0.79| .06 | --- |     |     |     |     |     |     |     |     |     |
| Sex            | 1.60 | 0.49| -.01| -.01| --- |     |     |     |     |     |     |     |     |
| Education      | 4.37 | 1.32| -.03| .00 | -.10*| --- |     |     |     |     |     |     |     |
| Organization Size | 2.21 | 1.35| .00 | -.01| -.04| .10*| --- |     |     |     |     |     |     |
| Industry       | 12.16| 4.72| .00 | .02 | .14**| .10*| -.06| --- |     |     |     |     |     |
| Organization Type | 1.61 | 1.16| -.03| -.03| .01 | .20**| .12*| *   |     |     |     |     |     |
| Occupational Category | 14.91| 9.02| -.06| -.02| .11*| -.26**| -.03 | -.09| -.10*| --- |     |     |
| Hours/Week     | 40.92| 7.26| .01 | .01 | -.26**| .20**| .13**| -.06| .01 | -.19**| --- |     |     |
| Organizational Tenure | 6.72 | 4.97| .46**| .00 | .01 | -.08 | .12*| .02 | .02 | -.11*| .07 | --- |     |
| Supervisor Tenure | 4.71 | 3.13| .34**| -.01| .04 | -.11*| -.04 | .03 | -.07 | -.05 | .06 | .87**|     |
| SFE            | 3.93 | 0.62| -.02| -.01| .02 | -.05 | -.01 | .05 | .01 | .04 | .01 | .01 |     |
| Source Credibility | 4.17 | 0.69| .00 | -.03| .04 | -.02 | -.01 | .08 | .05 | .03 | .01 | .07 |     |
| Feedback Quality | 3.98 | 0.82| .00 | -.02| .02 | .00 | -.02 | .09 | .03 | .02 | .03 | .04 |     |
| Feedback Delivery | 3.96 | 0.80| .01 | -.08| .08 | -.01 | .00 | .04 | .03 | -.03 | .06 | .03 |     |
| Favorable Feedback | 3.85 | 0.93| .06 | .02 | -.03 | -.07 | .05 | .00 | .00 | .06 | .04 | .01 |     |
| Unfavorable Feedback | 3.73 | 0.73| -.03| .01 | -.01 | -.04 | .02 | -.03 | -.10*| .08 | -.03 | -.09 |     |
| Availability   | 3.89 | 0.75| -.03| .04 | .00 | -.09 | -.05 | .05 | .00 | .06 | -.09 | -.04 |     |
| Promotes Feedback Seeking | 3.86 | 0.76| -.05| .01 | .00 | -.06 | -.02 | .01 | -.01 | .03 | .03 | .00 |     |

Note. SFE = supervisor feedback environment, ** p < .01 level (2-tailed), * p < .05. Ns = 420-422.
Table 4.1 continued.

<table>
<thead>
<tr>
<th>Mean</th>
<th>SD</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
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</thead>
<tbody>
<tr>
<td>12. SFE</td>
<td>3.93</td>
<td>0.62</td>
<td>0.00</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Source Credibility</td>
<td>4.17</td>
<td>0.69</td>
<td>0.07</td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14. Feedback Quality</td>
<td>3.98</td>
<td>0.82</td>
<td>0.05</td>
<td>0.90**</td>
<td>0.84**</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>15. Feedback Delivery</td>
<td>3.96</td>
<td>0.80</td>
<td>-0.01</td>
<td>0.80**</td>
<td>0.73**</td>
<td>0.69**</td>
<td></td>
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<tr>
<td>16. Favorable Feedback</td>
<td>3.85</td>
<td>0.93</td>
<td>-0.02</td>
<td>0.86**</td>
<td>0.70**</td>
<td>0.74**</td>
<td>0.69**</td>
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<td>17. Unfavorable Feedback</td>
<td>3.73</td>
<td>0.73</td>
<td>-0.07</td>
<td>0.43**</td>
<td>0.23**</td>
<td>0.25**</td>
<td>0.10**</td>
<td>0.22**</td>
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<tr>
<td>18. Availability Promotes Feedback Seeking</td>
<td>3.89</td>
<td>0.75</td>
<td>-0.01</td>
<td>0.77**</td>
<td>0.56**</td>
<td>0.62**</td>
<td>0.45**</td>
<td>0.62**</td>
<td>0.39**</td>
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<tr>
<td>19. Feedback Seeking</td>
<td>3.86</td>
<td>0.76</td>
<td>-0.01</td>
<td>0.83**</td>
<td>0.63**</td>
<td>0.70**</td>
<td>0.64**</td>
<td>0.70**</td>
<td>0.25**</td>
<td>0.62**</td>
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</tr>
<tr>
<td>20. Career Insight</td>
<td>4.14</td>
<td>0.64</td>
<td>-0.09</td>
<td>0.42**</td>
<td>0.39**</td>
<td>0.42**</td>
<td>0.30**</td>
<td>0.37**</td>
<td>0.21**</td>
<td>0.28**</td>
<td>0.35**</td>
</tr>
<tr>
<td>21. Need for Development</td>
<td>4.42</td>
<td>0.91</td>
<td>-0.04</td>
<td>-0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>-0.02</td>
<td>0.05</td>
<td>-0.07</td>
<td>-0.07</td>
<td>0.08</td>
</tr>
<tr>
<td>22. Self-Development</td>
<td>37.06</td>
<td>22.09</td>
<td>0.03</td>
<td>0.22**</td>
<td>0.19**</td>
<td>0.24**</td>
<td>0.15**</td>
<td>0.21**</td>
<td>0.12**</td>
<td>0.12**</td>
<td>0.21**</td>
</tr>
<tr>
<td>23. Self-Directed PCA</td>
<td>5.56</td>
<td>0.88</td>
<td>-0.07</td>
<td>0.41**</td>
<td>0.39**</td>
<td>0.40**</td>
<td>0.31**</td>
<td>0.34**</td>
<td>0.20**</td>
<td>0.22**</td>
<td>0.35**</td>
</tr>
<tr>
<td>24. Feedback Orientation</td>
<td>3.81</td>
<td>0.51</td>
<td>-0.09</td>
<td>0.49**</td>
<td>0.41**</td>
<td>0.48**</td>
<td>0.33**</td>
<td>0.41**</td>
<td>0.33**</td>
<td>0.33**</td>
<td>0.40**</td>
</tr>
<tr>
<td>25. POSED</td>
<td>4.86</td>
<td>0.96</td>
<td>-0.07</td>
<td>0.66**</td>
<td>0.54**</td>
<td>0.60**</td>
<td>0.52**</td>
<td>0.58**</td>
<td>0.29**</td>
<td>0.49**</td>
<td>0.60**</td>
</tr>
<tr>
<td>26. Coworkers</td>
<td>4.80</td>
<td>0.99</td>
<td>-0.03</td>
<td>0.39**</td>
<td>0.33**</td>
<td>0.36**</td>
<td>0.34**</td>
<td>0.35**</td>
<td>0.17**</td>
<td>0.24**</td>
<td>0.37**</td>
</tr>
<tr>
<td>27. Supervisor</td>
<td>4.88</td>
<td>1.12</td>
<td>-0.06</td>
<td>0.76**</td>
<td>0.61**</td>
<td>0.69**</td>
<td>0.58**</td>
<td>0.66**</td>
<td>0.32**</td>
<td>0.60**</td>
<td>0.67**</td>
</tr>
<tr>
<td>28. Resources</td>
<td>4.92</td>
<td>1.15</td>
<td>-0.08</td>
<td>0.54**</td>
<td>0.43**</td>
<td>0.49**</td>
<td>0.42**</td>
<td>0.47**</td>
<td>0.25**</td>
<td>0.39**</td>
<td>0.49**</td>
</tr>
<tr>
<td>29. POS</td>
<td>3.50</td>
<td>0.89</td>
<td>-0.07</td>
<td>0.56**</td>
<td>0.47**</td>
<td>0.53**</td>
<td>0.43**</td>
<td>0.52**</td>
<td>0.17**</td>
<td>0.43**</td>
<td>0.49**</td>
</tr>
</tbody>
</table>

Note. SFE = supervisor feedback environment; PCA = Proximal Career Attitude; POSED = Perceived Organizational Support for Employee Development; POS = Perceived Organizational Support. ** p < .01 level (2-tailed), * p < .05. Ns = 420-422.

Table 4.1 Continued.

<table>
<thead>
<tr>
<th>Mean</th>
<th>SD</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
<th>26</th>
<th>27</th>
<th>28</th>
<th>29</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. Need for Development</td>
<td>4.42</td>
<td>0.91</td>
<td>-0.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Self-Development</td>
<td>37.06</td>
<td>22.09</td>
<td>0.28**</td>
<td>0.12**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Self-Directed PCA</td>
<td>5.56</td>
<td>0.88</td>
<td>0.59**</td>
<td>0.04</td>
<td>0.32**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Feedback Orientation</td>
<td>3.81</td>
<td>0.51</td>
<td>0.44**</td>
<td>0.13**</td>
<td>0.44**</td>
<td>0.48**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. POSED</td>
<td>4.86</td>
<td>0.96</td>
<td>0.37**</td>
<td>0.10</td>
<td>0.46**</td>
<td>0.44**</td>
<td>0.59**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Coworkers</td>
<td>4.80</td>
<td>0.99</td>
<td>0.29**</td>
<td>0.14**</td>
<td>0.47**</td>
<td>0.43**</td>
<td>0.55**</td>
<td>0.82**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Supervisor</td>
<td>4.88</td>
<td>1.12</td>
<td>0.36**</td>
<td>0.06</td>
<td>0.40**</td>
<td>0.40**</td>
<td>0.55**</td>
<td>0.92**</td>
<td>0.61**</td>
<td></td>
</tr>
<tr>
<td>29. Resources</td>
<td>4.92</td>
<td>1.15</td>
<td>0.33**</td>
<td>0.07</td>
<td>0.37**</td>
<td>0.35**</td>
<td>0.46**</td>
<td>0.91**</td>
<td>0.64**</td>
<td>0.78**</td>
</tr>
<tr>
<td>30. POS</td>
<td>3.50</td>
<td>0.89</td>
<td>0.34**</td>
<td>-0.05</td>
<td>0.26**</td>
<td>0.32**</td>
<td>0.37**</td>
<td>0.69**</td>
<td>0.54**</td>
<td>0.64**</td>
</tr>
</tbody>
</table>

Note. PCA = Proximal Career Attitude; POSED = Perceived Organizational Support for Employee Development; POS = Perceived Organizational Support. ** p < .01 level (2-tailed), * p < .05. Ns = 420-422.
per week is linked to greater self-development ($r = .17, p < .01$), greater career insight ($r = .11, p < .05$), and stronger self-directed protean career attitude ($r = .15, p < .01$). To account for these relationships, all statistical analyses were initially conducted controlling for these variables; however, including these demographic variables in each model did not generally alter the findings. With this in mind, these variables were omitted from any further analyses, as research has suggested that the inclusion of unnecessary control variables may bias estimates and reduce statistical power (Becker, 2005).

As expected, the dimensions of the supervisor feedback environment were all significantly, positively intercorrelated, but ranged in magnitude from $r = .10$ (unfavorable feedback and feedback delivery) to $r = .84$ (source credibility and feedback quality). The same was true for components of the feedback orientation scale, which displayed moderately strong and positive correlations with other dimensions (range $r = .35$ to $.61, p < .01$). Perceived organizational support and perceived organizational support for employee development were strongly correlated as would be expected ($r = .69, p < .01$), and the intercorrelations among dimensions of perceived organizational support for employee development were also strong (range $r = .61$ to $.78, p < .01$). Additionally, the supervisor feedback environment was strongly correlated with perceived organizational support ($r = .56, p < .01$), with perceived organizational support for employee development in general ($r = .66, p < .01$), and with supervisor support for employee development in particular ($r = .76, p < .01$). These correlations were as strong as, and sometimes stronger than the intercorrelations observed for dimensions of supervisor feedback environment. Surprisingly, need for development did not correlate with many focal and demographic variables, and when it was correlated, was only weakly so. Need
for development was most strongly associated with the social awareness dimension of feedback orientation \( (r = .18, p < .05) \), but the lack of significant relationships with need for development is both unexpected and intriguing.

Hypotheses 1, 2, and 4 dealt with the relationships between the feedback environment and three variables: career insight, need for development, and self-development. An examination of the correlations presented in Table 4.1 indicated that a favorable feedback environment was positively related to engaging in self-development \( (r = .22, p < .01) \) and more strongly related to career insight \( (r = .42, p < .01) \), supporting Hypotheses 1 and 2. Hypothesis 4 proposed that a favorable feedback environment was positively related to perceived need for development, but this was not supported \( (r = -.01, p = .83) \). There was not a bivariate relationship between the supervisor feedback environment and need for development. Thus, Hypotheses 1 and 2 were supported and Hypothesis 4 was not: positive and significant relationships existed between the supervisor feedback environment and self-development, and between the supervisor feedback environment and career insight, but the notion that the supervisor feedback environment positively related to need for development did not hold true.

**Indirect Effects**

Hypotheses 3, 5, 6, and 7 dealt with indirect effects of the supervisor feedback environment through one of three mediating variables (see Figure 1.1). The PROCESS macro for SPSS (Hayes, 2013) was used to estimate the effects specified in each hypothesis independently of other hypothesized relationships, where the effect of \( X \) on \( Y \) occurs through \( M \) (Figure 4.1), and is represented by the product of the path coefficients \( \langle ab \rangle \), which represent the direct effect of \( X \) on \( M \) \( (a) \) and the direct effect of \( M \) on \( Y \) \( (b) \).
Additionally, this model estimates the direct effect of $X$ on $Y$ ($c'$) and calculates total effects of $X$ on $Y$ ($c$) by adding $ab$ to $c'$. Additionally, PROCESS provides normal theory tests of significance for path estimates, as well as bootstrapped confidence intervals for indirect effects, which are preferable to normal theory tests for indirect effects (Preacher & Hayes, 2008), and measures of effect size for the indirect effect.

Figure 4.1. Hayes (2013) PROCESS mediation Model 4 template used for Hypotheses 3, 5, 6, and 7.

Hypotheses 3 and 5 proposed indirect paths from the supervisor feedback environment to self-development through career insight (H3, Figure 4.2) and through perceived need for development (H5, Figure 4.3). With regard to Hypothesis 3, supervisor feedback environment was indirectly and positively related to self-development through career insight ($ab = 3.41$, C.I. = 1.80 to 5.45). A favorable supervisor feedback environment was linked to greater self-development activity in part because of the positive relationship between supervisor feedback environment and career insight.
Preacher and Kelley's (2011) $\kappa^2$, which expresses the magnitude of the indirect
effect in terms of a ratio to the maximum possible indirect effect that could have been
found, suggested the indirect effect was medium in size ($\kappa^2 = .089$, SE = .023, C.I. = .05
to .14). In sum, these results suggest a meaningful and positive indirect effect of
supervisor feedback environment on self-development through career insight, fully
supporting Hypothesis 3. Individuals reporting positive supervisor feedback
environments participated in more self-development activities, and this was in part
because of the likelihood of also having greater career insight.

Table 4.2. Model coefficients for the indirect effect of supervisor feedback environment on self-
development through career insight (Hypothesis 3).

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>$M$ (Career Insight)</th>
<th>$Y$ (Self-Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff</td>
<td>SE</td>
</tr>
<tr>
<td>$X$ (Supervisor Feedback Environment)</td>
<td>0.44</td>
<td>0.05</td>
</tr>
<tr>
<td>$M$ (Career Insight)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Constant</td>
<td>2.42</td>
<td>0.18</td>
</tr>
</tbody>
</table>

$R^2 = .18$

$F(1, 420) = 91.55, p < .001$

$R^2 = .09$

$F(2, 419) = 21.14, p < .001$

Note. $X$ = independent variable; $M$ = mediator variable, $Y$ = dependent variable. Reported coefficients
are unstandardized.
Results presented in Table 4.2 also provide additional support to other hypotheses. In particular, the supervisor feedback environment displayed a significant direct effect on self-development ($c' = 4.60$, $p = .01$) lending further support to Hypothesis 1. A favorable supervisor feedback environment was positively associated with higher levels of self-development, even holding the effects of career insight constant. The total effect of supervisor feedback environment on self-development was also positive and significant ($c = 8.01$, $p < .001$), reinforcing that there is a positive association between having a favorable feedback environment and participating in self-development activities. There was also a significant direct effect of the supervisor feedback environment on career insight ($a = .44$, $p < .001$) consistent with analyses supporting Hypothesis 2. As with self-development behavior, a favorable supervisor feedback environment was associated with greater levels of career insight, on average.

Hypothesis 5 proposed an indirect effect of supervisor feedback environment on self-development through need for development. Path analytic results for the model
estimated to address this hypothesis are presented in Table 4.3 and Figure 4.3. The confidence interval for the indirect path estimate included zero \((ab = -.05, \text{ C.I.} = -.62 \text{ to } .47)\), and indicated that there was no evidence of an indirect effect through need for development. The direct effect of the supervisor feedback environment on need for development was not significant \((a = -.02, p = .83)\), although the estimated path between need for development and self-development was significant \((b = 2.10, p = .01)\). In other words, while need for development was related to self-development, need for development was not affected by the supervisor feedback environment. As a result, there was no indirect effect of supervisor feedback environment on self-development through need for development, contrary to the expectations of Hypothesis 5.

Table 4.3. Model coefficients for the indirect effect of supervisor feedback environment on self-development through need for development (Hypothesis 5).

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>Consequent</th>
</tr>
</thead>
<tbody>
<tr>
<td>(X) (Supervisor Feedback Environment)</td>
<td>(M) (Need for Development)</td>
</tr>
<tr>
<td>(a)</td>
<td>Coeff</td>
</tr>
<tr>
<td>M (Need for Development)</td>
<td>---</td>
</tr>
<tr>
<td>Constant</td>
<td>(i_1)</td>
</tr>
</tbody>
</table>

\(R^2 = .00\) 
\(F(1,420) = .05, p = .83\)

\(R^2 = .06\) 
\(F(2,419) = 14.39, p < .001\)

Note. \(X = \text{ independent variable; } M = \text{ mediator variable, } Y = \text{ dependent variable. Reported coefficients are unstandardized.}\)
Although there was no evidence to support Hypothesis 5, the model did provide additional evidence that the supervisor feedback environment is directly related to employee self-development ($c' = 8.06, p < .001$), and that the total effect is also meaningful regardless of the negligible indirect effect ($c = 8.01, p < .001$), reinforcing support for Hypothesis 1. Although individuals with favorable feedback environments reported greater self-development, this is not co-occurring with greater perceived need for development, as hypothesized. Taken together, results from the model estimated in Figure 4.3 suggest that the direct path of supervisor feedback on self-development was almost entirely responsible for the total effect, as there was no indirect effect through need for development.

Hypotheses 6 and 7 proposed that feedback seeking mediates the feedback environment-career insight and feedback environment-need for development
relationships. Specifically, it was anticipated that one reason for greater career insight and need for development as a result of a favorable supervisor feedback environment was in part due to increased employee feedback seeking. Two separate models, one with each outcome, were estimated to determine whether feedback seeking transmits some of the favorable effects of the supervisor feedback environment. Both models were estimated with the same Model 4 template as was described for Hypotheses 3 and 5 (Figure 4.1).

Table 4.4. Model coefficients for the indirect effect of supervisor feedback environment on career insight through feedback seeking (Hypothesis 6).

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>$X$ (Supervisor Feedback Environment)</th>
<th>$M$ (Feedback Seeking)</th>
<th>$Y$ (Career Insight)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$a$ 0.22 SE 0.10 $p=0.02$</td>
<td>$c'$ 0.43 SE 0.05 $p&lt;0.001$</td>
<td></td>
</tr>
<tr>
<td>$M$ (Feedback Seeking)</td>
<td>---</td>
<td>$b$ 0.03 SE 0.02 $p=0.13$</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>$i_1$ 0.84 SE 0.40 $p=0.03$</td>
<td>$i_2$ 2.40 SE 0.18 $p&lt;0.001$</td>
<td></td>
</tr>
</tbody>
</table>

$R^2 = .013$ $F(1, 420) = 5.39$, $p = .021$ $R^2 = .183$ $F(2, 419) = 47.06$, $p < .001$

Note. $X$ = independent variable; $M$ = mediator variable, $Y$ = dependent variable. Reported coefficients are unstandardized.

The model for Hypothesis 6 is presented in Figure 4.4. Contrary to expectations, the indirect effect of the supervisor feedback environment on career insight through feedback seeking behavior was not supported by evidence from this analysis. Results suggested that feedback seeking did not mediate this relationship: the estimated indirect effect approached significance, but the confidence interval included zero ($ab = .01$, C.I. = -.001, .03). Thus, Hypothesis 6 was not supported, as feedback seeking played no definitive mediating role in the supervisor feedback environment-career insight relationship.
However, the direct effect of the supervisor feedback environment on career insight was significant (Table 4.4). A favorable supervisor feedback environment was related to increased feedback seeking ($a = .22$, $p = .02$), suggesting that individuals experiencing a supportive feedback environment are also likely to seek more feedback on average than those who experience an unsupportive feedback environment. Feedback seeking did not relate to career insight ($b = .03$, $p = .13$), while the supervisor feedback environment did have a positive, direct relationship with career insight ($c' = .43$, $p < .001$) corroborating evidence in support of Hypothesis 2 presented previously. Taken together, model results suggest that although a favorable supervisor feedback environment positively related to career insight ($c = .44$, $p < .001$), this relationship likely occurred without influence from an individual’s feedback seeking.

The model estimated for Hypothesis 7 appears in Figure 4.5. Feedback seeking behavior also played no role in transmitting the effects of the supervisor feedback environment.
environment to need for development \((ab = .02, \text{C.I.} = -.004, .063)\), providing no support for Hypothesis 7. Consistent with the model estimated for Hypothesis 6, supervisor feedback environment was again positively associated with feedback seeking \((a = .22, p = .02)\), and again estimates suggested no significant relationship between feedback seeking behavior and the outcome of interest, in this case need for development \((b = .08, p = .10)\). Although a favorable supervisor feedback environment was related to increased feedback seeking, feedback seeking was not, in turn, related to perceiving a need for development.

Unlike career insight, estimates presented in Table 4.5 suggest that the supervisor feedback environment is unrelated to need for development \((c = -0.04, p = .69)\). The direct effect of supervisor feedback environment on need for development was not significantly different from zero \((c’ \text{ in Figure 4.5 and Table 4.5})\), providing additional evidence that there was not a meaningful relationship between the supervisor feedback environment and need for development, even when holding feedback seeking constant. These findings are consistent with the previously reported correlation in Table 4.1 and provide further evidence that there was no meaningful relationship between supervisor feedback environment and need for development, contrary to the expectations of Hypothesis 4.
Table 4.5. Model coefficients for the indirect effect of supervisor feedback environment on need for development through feedback seeking (Hypothesis 7).

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>$M$ (Feedback Seeking)</th>
<th>$Y$ (Need for Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff</td>
<td>SE</td>
</tr>
<tr>
<td>$X$ (Supervisor Feedback Environment)</td>
<td>$a$</td>
<td>0.22</td>
</tr>
<tr>
<td>$M$ (Feedback Seeking)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Constant</td>
<td>$i_1$</td>
<td>0.84</td>
</tr>
</tbody>
</table>

$R^2 = .013$  
$F(1, 420) = 5.385, p = .021$  
$F(2, 419) = 1.349, p = .261$

Note. $X$ = independent variable; $M$ = mediator variable, $Y$ = dependent variable. Reported coefficients are unstandardized.

![Diagram](image)

Figure 4.5. Summary of simple mediation analysis results for Hypothesis 7. Note: standard errors for estimates reported in parentheses. $c'$ = the direct path between supervisor feedback environment and need for development, holding feedback seeking constant. $c$ = the total effect of supervisor feedback environment on need for development. *$p < .05$.  

94
Moderating Effects of Feedback Orientation

Hypotheses 8-12 dealt with the moderating effects of feedback orientation. To test these hypotheses, PROCESS (Hayes, 2013) was used to estimate the interactive effects of $X$ and $M$ on $Y$ using Model 1 (see Figure 4.6). For these analyses, $X$ and $M$ were both mean-centered to simplify interpretation of the main effects by turning on the PROCESS centering command. In addition to calculating the interactive effect of the predictor and moderator ($XM$), PROCESS applies the normal theory test of significance to the interaction term and uses the Johnson-Neyman technique to identify the point(s) in the distribution of $M$ where the effect of $X$ on $Y$ is significant. To help with visualization of the interaction if the interaction term was significant, values of the predictor and outcome were calculated for levels of feedback orientation at the 10th, 25th, 50th, 75th and 90th percentiles of the sample and plotted accordingly.

Hypotheses 8-10 anticipated that feedback orientation ($M$) would moderate the positive relationships between supervisor feedback environment and feedback seeking (H8), career insight (H9), and need for development (H10), respectively. Specifically, it was expected that a strong feedback orientation would amplify the positive relationship between the supervisor feedback environment and the three variables, while a weak feedback orientation would dampen the relationship for career insight and need for development. For feedback seeking, the relationship with the supervisor feedback environment was expected to be negative at low levels of feedback orientation.

Hypothesis 8 predicted a moderating effect of feedback orientation on the supervisor feedback environment-feedback seeking behavior relationship (Table 4.6). There was no main effect for the supervisor feedback environment on feedback seeking
Figure 4.6. Hayes (2013) PROCESS moderation Model 1 conceptual and statistical template.
behavior \((b_1 = -.03, t = -.32, p = .75)\) despite a small but significant bivariate relationship \((r = .11, p = .02)\); however, the main effect of feedback orientation on feedback seeking behavior was significant \((b_2 = .69, t = 5.31, p < .001)\), indicating that each one-unit increase in feedback orientation resulted in an increase in feedback seeking behavior when the supervisor feedback environment was held constant at the sample mean \((M = 3.93, SD = 0.62)\). The interaction term for the supervisor feedback environment and feedback orientation was not significant \((b_3 = .24, t = 1.62, p = .11)\). Therefore, the relationship between supervisor feedback environment and feedback seeking was not affected by feedback orientation, contrary to expectations in Hypothesis 8.

Table 4.6. Regression results for the moderation of the effect of supervisor feedback environment on feedback seeking by feedback orientation (Hypothesis 8).

<table>
<thead>
<tr>
<th></th>
<th>Coef</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.68</td>
<td>0.06</td>
<td>27.09</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Supervisor Feedback Environment ((X'))</td>
<td>-0.03</td>
<td>0.11</td>
<td>-0.32</td>
<td>.75</td>
</tr>
<tr>
<td>Feedback Orientation ((M'))</td>
<td>0.69</td>
<td>0.13</td>
<td>5.31</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Supervisor Feedback Environment x Feedback Orientation ((XM'))</td>
<td>0.24</td>
<td>0.15</td>
<td>1.62</td>
<td>.11</td>
</tr>
</tbody>
</table>

\[ R^2 = .079, \text{MSE} = 1.41 \]
\[ F(3, 418) = 11.95, p < .001 \]

Note. \(X'\) = centered predictor variable; \(M'\) = centered moderator variable; \(XM'\) = centered interaction term. Reported coefficients are mean centered.

Hypothesis 9 addressed the moderating effect of feedback orientation on the positive relationship between supervisor feedback environment and career insight (Table 4.7). Both the supervisor feedback environment and feedback orientation were positively and significantly related to career insight \((b_1 = .28, t = .56, p < .001; b_2 = .38, t = 6.31, p < .001)\), indicating that a more favorable supervisor feedback environment and a stronger feedback orientation were related to stronger career insight, when holding the other
constant at the respective sample mean. A one-unit increase in supervisor feedback
environment was associated with a slight increase in career insight, keeping feedback
orientation level constant ($M = 3.81, SD = 0.51$). Similarly, a one-unit increase in
feedback orientation was associated with an increase in career insight, keeping supervisor
feedback environment constant ($M = 3.93, SD = 0.62$). However, the interaction between
the supervisor feedback environment and feedback orientation was not significant ($b_3 = -
.013, t = -0.18, p = .86$) and thus not supportive of Hypothesis 9. Feedback orientation did
not influence the relationship between supervisor feedback environment and career
insight, although both predictors significantly and positively influenced career insight.
Instead, both greater feedback orientation and more favorable supervisor feedback
environments independently related to higher levels of career insight.

Table 4.7. Regression results for the moderation of the effect of supervisor feedback environment
on career insight by feedback orientation (Hypothesis 9).

<table>
<thead>
<tr>
<th></th>
<th>Coef</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>$i_1$</td>
<td>4.14</td>
<td>0.03</td>
<td>142.93</td>
</tr>
<tr>
<td>Supervisor Feedback Environment ($X'$)</td>
<td>$b_1$</td>
<td>0.28</td>
<td>0.05</td>
<td>5.60</td>
</tr>
<tr>
<td>Feedback Orientation ($M'$)</td>
<td>$b_2$</td>
<td>0.38</td>
<td>0.06</td>
<td>6.31</td>
</tr>
<tr>
<td>Supervisor Feedback Environment x Feedback Orientation ($XM'$)</td>
<td>$b_3$</td>
<td>-0.01</td>
<td>0.07</td>
<td>-0.18</td>
</tr>
</tbody>
</table>

$R^2 = .251$, $MSE = .31$

$F(3, 418) = 46.40$, $p < .001$

Note. $X'$ = centered predictor variable; $M'$ = centered moderator variable; $XM'$ = centered interaction term. Reported coefficients are mean centered.
Hypothesis 10 expected the positive relationship between supervisor feedback environment and need for development to be strengthened as feedback orientation increased. As presented in Table 4.8, both supervisor feedback environment and feedback orientation had a meaningful effect on need for development. Specifically, a one-unit increase in feedback orientation was associated with positive gains in perceived need for development \( (b_2 = .42, p = .002) \). However, an increase in supervisor feedback environment was associated with a *decline* in perceived need for development \( (b_1 = -0.23, p = .04) \), contrary to expectations. A favorable supervisor feedback environment was actually associated with lessened perceptions of development need.

A significant interaction term confirmed that feedback orientation moderated the supervisor feedback environment-need for development relationship \( (b_3 = -.43, p = .006) \), but the interaction was not in the expected direction. Instead of becoming stronger and more positive as feedback orientation increases, the relationship between the supervisor feedback environment and need for development was stronger and *negative* as feedback orientation increased.

| Table 4.8. Results from a regression analysis examining the moderation of the effect of supervisor feedback environment on need for development by feedback orientation (Hypothesis 10). |
|---|---|---|---|---|
| Intercept | 4.35 | 0.07 | 67.11 | <.001 |
| Supervisor Feedback Environment \((X')\) | -0.23 | 0.11 | -2.03 | .04 |
| Feedback Orientation \((M')\) | 0.42 | 0.13 | 3.14 | .002 |
| Supervisor Feedback Environment x Feedback Orientation \((XM')\) | -0.43 | 0.16 | -2.77 | .006 |

\[ R^2 = .042, \ MSE = 1.52 \]
\[ F(3, 418) = 6.15, p < .001 \]

Note. \( X' \) = centered predictor variable; \( M' \) = centered moderator variable; \( XM' \) = centered interaction term. Reported coefficients are mean centered.
The interaction was probed to determine the values of feedback orientation where the effect of supervisor feedback orientation on need for development exists using the J-N technique. Figure 4.7 depicts the size of the conditional effect as a function of feedback orientation, surrounded by 95% confidence intervals, shown by dotted lines. Any region of the X-axis where the confidence intervals include zero indicates a region of feedback orientation scores where the conditional effect of supervisor feedback environment on need for development was not significantly different from zero. The two vertical lines denote J-N transition points, and the region of hashed lines depicts the range in between where the effect does not exist. The J-N technique showed that the effect of the supervisor feedback environment on need for development was significantly different from zero and negative above a feedback orientation score of 3.7963 (effect = -0.22041, SE = 0.1121, t = -1.9664, p = 0.049, CI = -0.4407 to -0.0001), and not significant below this threshold. A second J-N transition point was identified at feedback orientation score of 1.8372. An examination of the standard error around the second J-N transition point suggested that this estimate was probably not reliable, and too few cases in the sample actually had scores below this point (< 1%). Following advice from Hayes (2013), it was ignored and only one J-N significance transition was retained for the conditional effect of the supervisor feedback environment on need for development. In sum, this analysis suggests a significant negative relationship between supervisor feedback environment and need for development at high levels of feedback orientation.
Figure 4.7. The conditional effect of supervisor feedback environment on need for development as a function of feedback orientation (Hypothesis 10). The effect is zero in the hashed region, and different from zero in the region to the right (high levels of feedback orientation).

For those low in feedback orientation (i.e., below the J-N transition point, 3.7963 as shown in Figure 4.7, and lines for the 10th and 25th percentiles of feedback orientation in Figure 4.8), the supervisor feedback environment was unrelated to need for development, while for those higher in feedback orientation (i.e., lines for the 50th, 75th, and 90th percentiles of feedback orientation in Figure 4.8), a stronger feedback environment was predictive of lower levels of perceived need for development. These findings partially support Hypothesis 10. Although there was an interaction, it was not in the anticipated direction, as more favorable feedback environments were related to lower, not higher, ratings for perceived need for development as feedback orientation increased.
Hypotheses 11 and 12 explored the moderation of the career insight-self-development (H11) and need for development-self-development relationships by feedback orientation (H12). In both cases, feedback orientation was expected to strengthen relationships between the two variables and self-development participation as feedback orientation increased. As mentioned in Chapter III, self-development was measured using a frequency count of each type of development activity over the past 12 months, and each respondent’s responses were summed to create an index representing the total number of development behaviors undertaken in the last 12 months.
For Hypothesis 11 (Table 4.9), both career insight and feedback orientation positively and significantly predicted self-development. The interaction of the two was also positive and significant ($b_3 = 6.17$, $p = .01$), supporting the hypothesis that feedback orientation and career insight interact to increase participation in self-development.

Table 4.9. Results from a regression analysis examining the moderation of the effect of career insight on self-development by feedback orientation (Hypothesis 11).

<table>
<thead>
<tr>
<th></th>
<th>Coef</th>
<th>SE</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>$i_1$</td>
<td>36.18</td>
<td>1.02</td>
<td>35.53</td>
</tr>
<tr>
<td>Career Insight ($X'$)</td>
<td>$b_1$</td>
<td>4.50</td>
<td>1.70</td>
<td>2.64</td>
</tr>
<tr>
<td>Feedback Orientation ($M'$)</td>
<td>$b_2$</td>
<td>16.73</td>
<td>2.09</td>
<td>8.02</td>
</tr>
<tr>
<td>Career Insight x Feedback Orientation ($XM'$)</td>
<td>$b_3$</td>
<td>6.17</td>
<td>2.41</td>
<td>2.57</td>
</tr>
</tbody>
</table>

$R^2 = .211$, $MSE = 387.56$
$F(3, 418) = 37.35$, $p < .001$

Note. $X'$ = centered predictor variable; $M'$ = centered moderator variable; $XM'$ = centered interaction term. Reported coefficients are mean centered.

The J-N technique was employed to determine the values of feedback orientation where the effect of career insight on self-development existed. Figure 4.9 depicts the size of the conditional effect of career insight on self-development as a function of feedback orientation, along with 95% confidence intervals. Any region of the x-axis where the confidence intervals include zero indicate a region of feedback orientation scores where the conditional effect of supervisor feedback environment on need for development was not significantly different from zero. Analyses revealed one J-N point of transition: the conditional effect of career insight on self-development is positive and significant at values of feedback orientation above 3.622, and a nonsignificant effect at and below this threshold.
The conditional effect of career insight on self-development as a function of feedback orientation (Hypothesis 11). The effect is zero in the hashed region and different from zero in the region to the right (high levels of feedback orientation).

The interaction was plotted by generating values for career insight and self-development at the 10th, 25th, 50th, 75th and 90th percentiles of feedback orientation, the moderator. As depicted in Figure 4.10, the relationship between career insight and self-development was stronger and positive at higher levels of feedback orientation (i.e., lines for the 50th, 75th, and 90th percentiles of feedback orientation), and no different from zero at lower levels of feedback orientation (i.e., 10th and 25th percentiles). Those with higher levels of feedback orientation (i.e., above the J-N point of transition, 3.622, represented by the region without shading shown in Figure 4.9) experienced a stronger relationship between career insight and self-development, such that career insight was increasingly
associated with greater participation in self-development. Stated differently, a stronger feedback orientation amplified the effects of career insight on self-development, resulting in a greater tendency to participate in self-development for individuals who reported stronger career insight and higher feedback orientation. In sum, these results fully support Hypothesis 11.

Figure 4.10. The career insight-self-development relationship at the 10th, 25th, 50th, 75th, and 90th percentiles of feedback orientation (Hypothesis 11).

Hypothesis 12 addressed the moderation of the positive relationship between need for development and self-development by feedback orientation (Table 4.10). First, no main effect of need for development on self-development ($b_1 = 1.09, t = .16, p = .16$) was
observed, consistent with previous findings. Although feedback orientation did demonstrate a significant main effect on self-development ($b_2 = 18.26, t = 9.30, p < .001$), feedback orientation did not interact with need for development ($b_3 = -.41, t = -.35, p = .73$).

Therefore, Hypothesis 12 was not supported as the relationship between need for development and self-development was not moderated by feedback orientation.

Table 4.10. Results from a regression analysis examining the moderation of the effect of need for development on self-development by feedback orientation (Hypothesis 12).

<table>
<thead>
<tr>
<th></th>
<th>Coeff</th>
<th>SE</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>$i_1$</td>
<td>37.10</td>
<td>0.97</td>
<td>38.08</td>
</tr>
<tr>
<td>Need for Development ($X'$)</td>
<td>$b_1$</td>
<td>1.09</td>
<td>0.89</td>
<td>0.16</td>
</tr>
<tr>
<td>Feedback Orientation ($M'$)</td>
<td>$b_2$</td>
<td>18.26</td>
<td>1.96</td>
<td>9.30</td>
</tr>
<tr>
<td>Need for Development x Feedback Orientation ($XM'$)</td>
<td>$b_3$</td>
<td>-0.41</td>
<td>1.16</td>
<td>-0.35</td>
</tr>
</tbody>
</table>

$R^2 = .193$, $MSE = 396.49$  
$F(3, 418) = 33.37$, $p < .001$

Note. $X'$ = centered predictor variable; $M'$ = centered moderator variable; $XM'$ = centered interaction term. Reported coefficients are mean centered.

Hypothesis 13 addressed the relationship between self-directed protean career attitude and career insight, and proposed they would be positively related. This hypothesis was supported ($r = .59, p < .001$), based on evidence from correlation coefficients presented in Table 4.1 showing a strong and positive relationship between the two variables.

Finally, Hypothesis 14 proposed that self-directed protean career attitude would moderate the positive relationship between need for development and self-development. Specifically, it was anticipated that the relationship would be stronger and positive for higher levels of self-directed protean career attitude, and weaker or non-existent for lower levels of self-directed protean career attitude. Both need for development ($b_1 = 2.01, t = .106$
2.45, \( p = .02 \) and self-directed protean career attitude \( (b_2 = 7.72, t = 6.50, p < .001) \) displayed significant and positive main effects on self-development, such that a one-unit increase in need for development is associated with participating in 2 additional development activities on average, and a one unit increase in self-directed protean career attitude is linked to an average of 7.8 additional development activities, holding the other variable constant (Table 4.11). However, Hypothesis 14 was not supported, as the interaction term was negative and not significant \( (b_3 = -.89, t = -1.16, p = .25) \). Self-directed protean career attitude did not moderate the relationship between perceived need for development and participation in self-development.

Table 4.11. Results from a regression analysis examining the moderation of the effect of need for development on self-development by self-directed protean career attitude (Hypothesis 14).

<table>
<thead>
<tr>
<th></th>
<th>Coeff</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>( i_1 )</td>
<td>37.10</td>
<td>1.01</td>
<td>36.61</td>
</tr>
<tr>
<td>Need for Development ( (X') )</td>
<td>( b_1 )</td>
<td>2.01</td>
<td>0.82</td>
<td>2.45</td>
</tr>
<tr>
<td>Self-Directed Protean Career Attitude ( (M') )</td>
<td>( b_2 )</td>
<td>7.72</td>
<td>1.19</td>
<td>6.50</td>
</tr>
<tr>
<td>Need for Development x Self-Directed Protean Career Attitude ( (XM') )</td>
<td>( b_3 )</td>
<td>-0.89</td>
<td>0.77</td>
<td>-1.16</td>
</tr>
</tbody>
</table>

\( R^2 = .119, \ MSE = 432.96 \)
\( F(3, 418) = 18.82, p < .001 \)

Note. \( X' \) = centered predictor variable; \( M' \) = centered moderator variable; \( XM' \) = centered interaction term. Reported coefficients are mean centered.

**Summary of Results**

Overall, five hypotheses were supported by the analyses in the present study. As predicted, the supervisor feedback environment was positively and significantly related to self-development and to career insight, supporting Hypotheses 1 and 2. The supervisor feedback environment was also found to positively relate to self-development indirectly through career insight, providing additional support for Hypotheses 1 and 2, and
supporting Hypothesis 3. Additionally, self-directed protean career attitude was positively and strongly related to career insight, consistent with previous literature and in support of Hypothesis 13.

Feedback orientation was supported as a moderator in two hypotheses. First, feedback orientation moderated the positive relationship between career insight and self-development by amplifying the positive relationship between the two at higher levels of feedback orientation. At lower levels of feedback orientation, career insight and self-development were actually unrelated. This pattern is consistent with and supportive of Hypothesis 11. Second, feedback orientation also moderated the relationship between supervisor feedback environment and need for development. However, this relationship was not positive, as anticipated in Hypothesis 4, and the moderating effect was actually negative, rather than positive as predicted in Hypothesis 10. Greater feedback orientation was associated with a negative relationship between supervisor feedback environment and need for development, such that as feedback environment increased in favorability, the perceived need for development actually decreased. At lower levels of feedback orientation, there was no relationship between supervisor feedback environment and need for development. Thus, while feedback orientation did moderate the supervisor feedback environment-need for development relationship, the unanticipated pattern of effects resulted in only partial support of Hypothesis 10.

There were a number of hypotheses that were unfortunately not supported. Interestingly, there was no relationship between the supervisor feedback environment and need for development, and thus no support for Hypothesis 4. Consistent with this finding, there was no indirect relationship between supervisor feedback environment and need for development.
development through feedback seeking as expected in Hypothesis 7. This pattern was repeated, as supervisor feedback environment was not indirectly related to self-development through need for development, preventing support for Hypothesis 5. Additionally, the need for development-self-development relationship was not moderated by feedback orientation as predicted in Hypothesis 12. The need for development-self-development relationship was also not moderated by self-directed protean career attitude, resulting in the rejection of Hypothesis 14.

Consistent with the unanticipated findings regarding need for development in Hypothesis 7, feedback seeking was also not a carrier of the indirect effect of the supervisor feedback environment to career insight, leaving Hypothesis 6 unsupported. The relationship between supervisor feedback environment and feedback seeking was anticipated to be influenced by feedback orientation as a moderator in Hypothesis 8; however, no moderating effect was found.

Finally, the positive relationship between the supervisor feedback environment and career insight supported in Hypothesis 2 was not moderated by feedback orientation as expected, and Hypothesis 9 was not supported as a result. An overall summary of hypothesis support is provided in Table 4.12, along with an index of the tables and figures associated with each Hypothesis for easy reference.
Table 4.12. Summary of hypotheses and results.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Table</th>
<th>Figure</th>
<th>Supported?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1  Supervisor FE positively related to Self-Development</td>
<td>4.1</td>
<td>4.1</td>
<td>Yes</td>
</tr>
<tr>
<td>H2  Supervisor FE positively related to Career Insight</td>
<td>4.1</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>H3  Supervisor FE → Career Insight → Self-Development</td>
<td>4.2</td>
<td>4.2</td>
<td>Yes</td>
</tr>
<tr>
<td>H4  Supervisor FE positively related to Need for Development</td>
<td>4.1</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>H5  Supervisor FE → Need for Development → Self-Development</td>
<td>4.3</td>
<td>4.3</td>
<td>No</td>
</tr>
<tr>
<td>H6  Supervisor FE → Feedback Seeking → Career Insight</td>
<td>4.4</td>
<td>4.4</td>
<td>No</td>
</tr>
<tr>
<td>H7  Supervisor FE → Feedback Seeking → Need for Development</td>
<td>4.5</td>
<td>4.5</td>
<td>No</td>
</tr>
<tr>
<td>H8  Feedback Orientation moderates Supervisor FE-Feedback Seeking relation</td>
<td>4.6</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>H9  Feedback Orientation moderates Supervisor FE-Career Insight relationship</td>
<td>4.7</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>H10 Feedback Orientation moderates Supervisor FE-Need for Development relationship</td>
<td>4.8</td>
<td>4.8</td>
<td>Partial</td>
</tr>
<tr>
<td>H11 Feedback Orientation moderates Career Insight-Self-Development relation</td>
<td>4.9</td>
<td>4.10</td>
<td>Yes</td>
</tr>
<tr>
<td>H12 Feedback Orientation moderates Need for Development-Self-Development relationship</td>
<td>4.10</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>H13 Self-Directed PCA positively related to Career Insight</td>
<td>4.1</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>H14 Self-Directed PCA moderates Need for Development-Self-Development relationship</td>
<td>4.11</td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>
Research Question 1

The first Research Question concerned the direct and indirect effects of the supervisor feedback environment on self-development taking all of the mediating variables investigated in Hypotheses 3, 5, 6, and 7 into consideration together. In Figure 1.1, two types of paths are depicted that were not investigated previously in hypotheses: mediators operating at the same time but separately in parallel fashion, and mediators that operate in a sequential chain. Addressing RQ1 requires a multiple mediation approach. Specifically, answering RQ1 requires investigating these indirect effects in concert to see if the relationship between the supervisor feedback environment and self-development might rely more heavily upon one path over another.

First, this means that the effect of supervisor feedback environment on self-development functions through multiple mediators – career insight (H3 & H6), need for development (H5 & H7), and feedback seeking (H6 & H7) – simultaneously (Figure 4.11). A multiple mediator approach is important in this instance as the mediators are likely to be correlated, and indirect effects cannot be accurately summed from the series of single mediation analyses presented for Hypotheses 3, 5, 6, & 7 (Preacher & Hayes, 2008). Examining the effects of career insight ($M_1$) and need for development ($M_2$) together as mediators of the supervisor feedback environment-self-development relationship implies that the mediators operate in parallel—that is, at the same time with the same $X$ and $Y$ variables in their model. Although feedback seeking was not explicitly hypothesized or implied as a mediator of the supervisor feedback environment-self-development relationship, its effect as $M_3$ may also be examined in concert with career
insight and need for development. This approach allows for the direct comparison between various mediators in Figure 1.1.

Second, as partially explored in Hypotheses 6 and 7, feedback seeking could be mediating the effect of the supervisor feedback environment on career insight and need for development, which in turn affect self-development. In this case, the mediators may operate in serial (Figure 4.13 for this template): the mediating effect of the first variable (feedback seeking) influences the mediating effect of the second variable (career insight or need for development). In this case, the effect of each mediator is carried through onto all following mediators, as implied by the path from supervisor feedback environment to self-development through both feedback seeking and career insight, and through both feedback seeking and need for development in Figure 1.1.

**Parallel Mediation Effects**

To examine the relative strength of the mediators operating in parallel in the supervisor feedback environment-self-development relationship, Model 4 was estimated in PROCESS (Figure 4.11) with career insight as $M_1$, need for development as $M_2$, both of which were expected to mediate the effect of the supervisor feedback environment on self-development in Figure 1.1. This is the same template that is used to estimate mediation with a single mediator (i.e., Figure 4.1 as employed to address H3, H5, H6, and H7); however, PROCESS calculates the additional $a_i$ and $b_i$ pathways, standard errors, and significance tests for each mediator, the estimate for each $a_ib_i$ path with corresponding confidence intervals and standard errors, and provides some additional tools to compare the indirect effects. Specifically, PROCESS offers bootstrapped confidence intervals for pairwise comparisons between specific indirect effects. If the
difference between the effects is non-zero, it can be concluded that their difference is non-zero; however, conclusions about magnitude or strength differences can only be made if the point estimates for the two specific indirect effects being compared are of the same sign (Hayes, 2013).

Results from the model estimation described above are presented in Table 4.13 and depicted in Figure 4.12. Consistent with Hypothesis 3, the supervisor feedback environment was related to career insight \((a_1 = 0.44, p < .001)\) and career insight carried its effect to self-development \((a_1b_1 = 3.62, \text{C.I.} = 2.30\) to 5.24\). Consistent with the results for Hypothesis 5, supervisor feedback environment did not influence need for development \((a_2 = -0.02, p = .83)\), which did not transmit the effect to self-development \((a_2b_2 = -.05, \text{C.I.} = -.55\) to .43\). A comparison of the two indirect effects (see Table 4.14) confirmed this conclusion, as the indirect path through career insight was significantly larger than the indirect path through need for development, which was not significantly different from zero \((M_1 - M_2 = 3.68, \text{C.I.} = 2.27\) to 5.39\). In sum, career insight carries the indirect effect and need for development does not, as suggested by results presented in conjunction with the hypotheses.
Table 4.13. Model coefficients for the indirect effect of supervisor feedback environment on self-development through career insight and need for development, modeled as parallel mediators (Research Question 1).

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>M1 (Career Insight)</th>
<th>M2 (Need for Development)</th>
<th>Y (Self-Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff</td>
<td>SE</td>
<td>p</td>
</tr>
<tr>
<td>X (Supervisor Feedback Environment)</td>
<td>a1</td>
<td>0.44</td>
<td>0.05</td>
</tr>
<tr>
<td>M1 (Career Insight)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2 (Need for Development)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>b0</td>
<td>2.43</td>
<td>0.18</td>
</tr>
</tbody>
</table>

\[ R^2 = .179 \]
\[ F(1, 420) = 55.31, p < .001 \]
\[ R^2 = .0001 \]
\[ F(1, 420) = .045, p = .83 \]
\[ R^2 = .11 \]
\[ F(3, 418) = 17.37, p < .001 \]

Note. X = independent variable; M = mediator variable, Y = dependent variable. Reported coefficients are unstandardized.

Figure 4.12. Statistical results for the parallel mediator model.
Table 4.14. Indirect effects of supervisor feedback environment on self-development through parallel mediators, and paired contrasts of the differences corresponding to Figure 4.12.

<table>
<thead>
<tr>
<th>Indirect Paths</th>
<th>Effect</th>
<th>SE</th>
<th>C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Insight ($M_1$)</td>
<td>3.62</td>
<td>0.87</td>
<td>2.30</td>
</tr>
<tr>
<td>Need for Development ($M_2$)</td>
<td>-0.05</td>
<td>0.29</td>
<td>-0.55</td>
</tr>
<tr>
<td>Total Indirect Effect</td>
<td>3.60</td>
<td>0.90</td>
<td>2.12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paired Contrasts</th>
<th>Effect</th>
<th>SE</th>
<th>C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M_1 - M_2$</td>
<td>3.68</td>
<td>0.93</td>
<td>2.27</td>
</tr>
</tbody>
</table>

Note. $M_i$ = mediator variable. C.I = 95% confidence interval. Reported coefficients are unstandardized.

**Serial Mediation Effects**

A serial mediator model differs from parallel mediator model in that a parallel mediator model assumes no causal relationship between the two mediators (Hayes, 2013). Hypotheses 6 and 7 suggested that feedback seeking may in part cause the relationship between supervisor feedback environment and both career insight and need for development, which in turn affect self-development. While this assertion was not supported in the context of simple mediation analyses for Hypothesis 6 or 7, a second set of models was estimated to investigate whether the same pattern held when the variables were considered as serial mediators of the supervisor feedback environment-self-development relationship. Doing so provided another way to understand how the mediators may work together within the context of the focal relationship between the supervisor feedback environment and self-development.

PROCESS Model 6 allows for the estimation of multiple mediators in this fashion (see Figure 4.13), where the total, direct, and indirect effects of $X$ on $Y$ are estimated
while modeling a process where $X$ causes $M_1$, which in turn causes $M_2$, which causes $Y$. The resulting model includes three indirect paths: one through each mediator individually (e.g., $a_1b_1$), and one through both mediators (i.e., $a_1d_21b_1$). Because PROCESS does not allow for the estimation of both serial and parallel effects in the same equation, two versions of Model 6 were estimated with feedback seeking as $M_1$ and either career insight (Figure 4.14) or need for development (Figure 4.15) as $M_2$, the second mediator in the serial mediation chain. Note that although this analysis inherently suggests a causal relationship between $M_1$ and $M_2$ (Hayes, 2013), a casual inference cannot be made given the study’s correlational design.

![Figure 4.13. Hayes (2013) multiple mediator Model 6 template.](image)

Results from this model are presented in Table 4.15. Regarding the model with the serial path including career insight as $M_2$ (Figure 4.14), supervisor feedback environment was positively and significantly related to feedback seeking ($a_1 = 0.22, p = 0.02$), and to career insight ($a_2 = 0.43, p < .001$). Feedback seeking was positively related to self-development ($b_1 = 4.49, p < .001$), but had no effect on career insight ($d_21 = 0.03, p$
Career insight was positively and significantly related to self-development \((b_2 = 7.11, p < .001)\). With regard to indirect effects, supervisor feedback environment indirectly affected self-development through feedback seeking \((a_1b_1 = 1.01, \text{ C.I.} = 0.20 \text{ to } 2.17)\), and through career insight \((a_2b_2 = 3.05, \text{ C.I.} = 1.37 \text{ to } 4.92)\), but not through both feedback seeking and career insight \((a_1d_2b_2 = 0.06, \text{ C.I.} = -0.00 \text{ to } 0.21)\). Thus, there was no evidence of a serial indirect effect, but further evidence of indirect effects of supervisor feedback environment on self-development through feedback seeking and career insight independently. This finding is consistent with results for Hypothesis 6, where there was no observed indirect effect of the supervisor feedback environment on career insight through feedback seeking.

Figure 4.14. Results from serial multiple mediator analysis for Research Question 1. Note: standard errors for estimates are reported in parentheses. \(c'\) = the direct path between supervisor feedback environment and self-development, holding the mediators constant. \(c\) = the total effect of supervisor feedback environment on self-development, including both direct and indirect paths as designated. *\(p < .05\), **\(p < .001\).
Table 4.15. Path analytic results from serial mediation model estimated for Research Question 1.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>M1 (Feedback Seeking)</th>
<th>M2 (Career Insight)</th>
<th>Y (Self-Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef</td>
<td>SE</td>
<td>p</td>
</tr>
<tr>
<td>X (Supervisor Feedback</td>
<td>α1</td>
<td>0.22</td>
<td>0.10</td>
</tr>
<tr>
<td>Environment)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1 (Feedback Seeking)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>M2 (Career Insight)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Constant</td>
<td>h01</td>
<td>0.84</td>
<td>0.39</td>
</tr>
</tbody>
</table>

R² = .01
F(1, 420) = 5.38, p = .02

R² = .006
F(1, 420) = 1.35, p = .26

R² = .13
F(1, 415) = 20.58, p < .001

Note. X = independent variable; M = mediator variable; Y = dependent variable. Unstandardized coefficients.

Table 4.16. Indirect effects of supervisor feedback environment on self-development and paired contrasts between mediated paths estimated for serial mediation model including career insight (Figure 4.14).

<table>
<thead>
<tr>
<th>Indirect Paths</th>
<th>Effect</th>
<th>SE</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback Seeking (M1)</td>
<td>1.01</td>
<td>0.49</td>
<td>0.20</td>
<td>2.17</td>
</tr>
<tr>
<td>Feedback Seeking and Career Insight (M1M2)</td>
<td>0.06</td>
<td>0.05</td>
<td>-0.00</td>
<td>0.21</td>
</tr>
<tr>
<td>Career Insight (M2)</td>
<td>3.05</td>
<td>0.91</td>
<td>1.37</td>
<td>4.92</td>
</tr>
<tr>
<td>Total Indirect Effect</td>
<td>4.11</td>
<td>1.03</td>
<td>2.18</td>
<td>6.19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paired Contrasts</th>
<th>Effect</th>
<th>SE</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1-M1M2</td>
<td>0.95</td>
<td>0.47</td>
<td>0.19</td>
<td>2.09</td>
</tr>
<tr>
<td>M1-M2</td>
<td>-2.04</td>
<td>1.06</td>
<td>-4.11</td>
<td>-0.01</td>
</tr>
<tr>
<td>M1M2-M2</td>
<td>-2.99</td>
<td>0.91</td>
<td>-4.86</td>
<td>-1.34</td>
</tr>
</tbody>
</table>

Note. M = mediator variable. C.I = 95% confidence interval. Reported coefficients are unstandardized.

An examination of the paired contrasts between the three indirect effects confirmed that differences existed between them (Table 4.16). First, both effects including only one mediator were larger than the indirect effect including them both, consistent with findings reported above. Additionally, the indirect effect through feedback seeking was smaller than the indirect effect through career insight, and this difference was meaningful and nonzero, but just barely so. These results suggest that the
indirect path through career insight carried more of the indirect effect of the supervisor
feedback environment than the serial path through feedback seeking, and both single
mediator paths carried more effect individually than did the serial indirect path through
both feedback seeking and career insight.

The supervisor feedback environment was also directly related to self-
development ($c' = 3.90, p = .03$), and the total effect of supervisor feedback environment
on self-development was statistically different from zero ($c = 8.01, p < .001$), confirming
that there was a meaningful effect of supervisor feedback environment on self-
development. Taken together, these results support the idea that the supervisor feedback
environment was related to self-development, consistent with results presented
throughout. Additionally, this relationship included both direct and indirect components,
as supervisor feedback environment related to self-development indirectly through
feedback seeking and career insight individually, but not through the serial feedback
seeking-career insight path.

The second serial model included need for development as $M_2$ in the serial
mediation chain (Figure 4.15). Results from this model are presented in Table 4.17.
Supervisor feedback environment was positively related to feedback seeking ($a_1 = 0.22, p
= .02$), but unrelated to need for development ($a_2 = -0.04, p = .69$). Feedback seeking was
unrelated to need for development ($d_{21} = 0.08, p = .10$) and did not carry the effect of the
supervisor feedback environment to need for development indirectly (consistent with
results for Hypothesis 7), but was positively related to self-development ($b_1 = 4.59, p < .001$). Need for development was also positively and significantly related to self-
development ($b_2 = 1.74, p = .03$). With regard to the three indirect effects, feedback
seeking carried some of the effect of the supervisor feedback environment to self-development ($a_1b_1 = 1.03, \text{C.I.} = 0.19 \text{ to } 2.17$), but not through need for development ($a_1d_2b_2 = 0.03, \text{C.I.} = -0.00 \text{ to } 0.17$). Need for development was not a mediator of the supervisor feedback environment-self-development relationship ($a_2b_2 = -0.07, \text{C.I.} = -0.62 \text{ to } 0.32$). Only feedback seeking in isolation mediated the supervisor feedback environment-need for development relationship.

Figure 4.15. Results from a serial multiple mediator analysis for Research Question 1. Note: standard errors for estimates are reported in parentheses. $c' = $ the direct path between supervisor feedback environment and self-development, holding the mediators constant. $c = $ the total effect of supervisor feedback environment on self-development, including both direct and indirect paths as designated. *$p < .05$, **$p < .001$. 

\begin{align*}
    a_1 &= 22^\ast (10) \\
    a_2 &= .04 (10) \\
    b_2 &= 4.59^\ast\ast (.83) \\
    b_2 &= 1.74^\ast\ast (.80) \\
    c' &= 7.02^\ast\ast (1.65) \\
    c &= 8.01^\ast\ast (1.70)
\end{align*}
Table 4.17. Path analysis results from serial multiple mediator model depicted in Figure 4.15.

Table 4.18. Indirect effects of supervisor feedback environment on self-development and paired comparisons between the indirect pathways for the serial mediation model including need for development (Figure 4.15).

Unsurprisingly, the paired contrast results confirmed that there were meaningful differences between the three paths (Table 4.18). The indirect path through feedback seeking was significantly larger than the path through need for development ($M_1 - M_2 = 1.10$, C.I. = 0.13 to 2.33), and the difference between the feedback seeking path and the
feedback-seeking-need for development path was also nonzero ($M_1 - M_2 = 1.00$, C.I. = 0.18 to 2.13). There was no difference between the path through need for development and the path through both feedback seeking and need for development ($M_1 M_2 - M_2 = .10$, C.I. = -0.26 to 0.72). Additionally, the supervisor feedback environment directly affected self-development ($c' = 7.02$, $p < .001$), and the total effect was positive and non-zero ($c = 8.01$, $p < .001$), both of which suggest that a favorable feedback environment related to increased self-development in multiple ways. Taken together, these results suggest that the supervisor feedback environment directly affected self-development, and affected self-development indirectly via feedback seeking, but did not affect self-development through need for development, nor through both feedback seeking and need for development.

**Research Question 2**

The second Research Question addressed whether the indirect effect of supervisor feedback environment on self-development, through career insight and need for development (Hypotheses 3 and 5), is conditional upon either feedback orientation or self-directed protean career attitude. Hypotheses 8-12 investigated the moderating effect of feedback orientation, and results suggested that feedback orientation moderates the relationship between the supervisor feedback environment and need for development (H10, Table 4.8), and the relationship between career insight and self-development (H11, Table 4.9). In the case of need for development, higher levels of feedback orientation were associated with a stronger and negative relationship between supervisor feedback environment and need for development, while at lower levels of feedback orientation supervisor feedback environment and need for development were unrelated, partially
supporting Hypothesis 10. Feedback orientation also moderated the career insight-self-development relationship, with higher levels of feedback orientation related to a stronger and positive relationship between the two, while the relationship was not significant at lower levels of feedback orientation.

Thus, it is possible that the effects of the supervisor feedback environment on self-development through career insight or need for development could be influenced by their interaction with feedback orientation as a moderator. In other words, the indirect effect of supervisor feedback environment on self-development through both career insight and need for development, as implied by Figure 1.1, may change at different levels of feedback orientation. To explore this question, a conditional indirect effects approach was taken to assess the indirect effects at different levels of the moderator, again employing the Bootstrapping approach as implemented by PROCESS (Hayes, 2013). Several models were estimated to investigate various configurations of the two moderators in Figure 1.1, examining feedback orientation as a moderator of the a paths of the indirect relationships between supervisor feedback environment and self-development, then as a moderator of the b paths, before examining feedback orientation as a two-stage moderator at both a and b paths.

Two approaches were used to determine whether estimates presented for a given model were evidence of a conditional indirect effect—an indirect effect that is significantly non-zero, depending upon the level of the moderator (feedback orientation). First, estimates of the conditional indirect effect (ω) for each mediator were calculated at various levels of the moderator. PROCESS estimates the indirect effects at the 10th, 25th, 50th, 75th, and 90th percentiles of the moderator in the sample, which provides more
specific information about the nature of the conditionality of the indirect effect than an approach using one standard deviation above and below the mean.

Second, for certain models, PROCESS automatically implements the formal test of moderated mediation described in Hayes (2013), calculates the index of moderated mediation, and provides an inference as to whether or not the index is statistically different from zero (Hayes, 2015). In this analysis, the index of moderated mediation is the slope of the line relating the size of the conditional indirect effect of $X$ on $Y$ through each $M$ to the moderator. The index of moderated mediation can be expressed as a linear function for Models 7 and 14, but cannot be calculated for Model 58 because the resulting conditional effect is nonlinear when there is a continuous moderator of both $a$ and $b$ paths simultaneously. As a result, the index of moderated mediation will only be presented for single-path moderation analyses.

**Feedback Orientation as a Single-Path Moderator**

First, template Model 7 was estimated to explore the conditional indirect effect of supervisor feedback environment on self-development through both career insight and need for development in parallel, considering feedback orientation as a moderator of the $a$ paths linking the supervisor feedback environment to the mediator variables (Figure 4.16). In other words, Model 7 assesses whether the interaction of the supervisor feedback environment and feedback orientation influence the mediators in a way that affects the indirect effects of supervisor feedback environment on self-development. Results for the model estimated with career insight and need for development as mediators are presented in Table 4.19. Consistent with findings reported for Hypotheses 9 and 10, feedback orientation moderated the supervisor feedback environment-need for
development relationship \((a_{32} = -0.43, p < .001)\), but did not moderate the supervisor feedback environment-career insight relationship \((a_{31} = -0.01, p = .86)\). Although the effect of the supervisor feedback environment on career insight was not conditional on level of feedback orientation, both feedback orientation and supervisor feedback environment were significantly and positively related to career insight \((a_{21} = 0.38, p < .001; a_1 = 0.28, p < .001)\). Additionally, the supervisor feedback environment and feedback orientation were both significant predictors of need for development \((a_2 = -0.22, p = .04; a_{22} = 0.42, p = .002)\), as was the interaction of the two. A favorable supervisor feedback environment was negatively related to need for development, while feedback orientation was positively associated with need for development.

To better understand the conditionality of these effects, values of the indirect effect through each mediator were estimated at the 10th, 25th, 50th, 75th, and 90th percentiles of feedback orientation in the sample (Table 4.20). Examining the indirect effects and their conditionality revealed a pattern for the two mediators consistent with previous findings. There was no evidence that the indirect effect of the supervisor feedback environment on self-development through career insight was dependent upon feedback orientation as a moderator of the \(a\) path, as the indirect effect \((\omega)\) was positive and nonzero at all levels of feedback orientation \((W)\). However, the indirect effect of supervisor feedback environment on self-development through need for development was conditional on feedback orientation: for levels of feedback orientation greater than or equal to the 50th percentile \((W = 3.85, \omega = -0.60, \text{C.I.} = -1.69 \text{ to } -0.04)\), the indirect effect was observed, but the indirect effect was not statistically different from zero below the 50th percentile of feedback orientation.
Figure 4.16. Conceptual and statistical depictions of PROCESS Model 7 template (Hayes, 2013) for Research Question 2 reflecting feedback orientation as an $a$ path moderator of the indirect effect of supervisor feedback environment on self-development through career insight and need for development.
Table 4.19. Path analytic results from analysis of the conditional indirect effect of supervisor feedback environment on self-development through 2 parallel mediators with feedback orientation as an 𝛼 path moderator (Research Question 2).

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Coeff</th>
<th>SE</th>
<th>p</th>
<th>Coeff</th>
<th>SE</th>
<th>p</th>
<th>Coeff</th>
<th>SE</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₁ (Career Insight)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X (Supervisor Feedback Environment)</td>
<td>0.28</td>
<td>0.05</td>
<td>&lt;.001</td>
<td>-0.22</td>
<td>0.11</td>
<td>.04</td>
<td>4.44</td>
<td>1.82</td>
<td>.02</td>
</tr>
<tr>
<td>M₁ (Need for Development)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M₂ (Career Insight)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M₂ (Need for Development)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>4.14</td>
<td>0.03</td>
<td>&lt;.001</td>
<td>4.35</td>
<td>0.06</td>
<td>&lt;.001</td>
<td>5.88</td>
<td>7.40</td>
<td>.43</td>
</tr>
</tbody>
</table>

Note: Values of feedback orientation are centered and presented at the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution of feedback orientation in the sample. M₁ = mediator variable; W = moderator variable; ω = size of the indirect effect; seω = the standard error of the effect; C.I. = 95% confidence interval.

The index of moderated mediation expresses the indirect effect of X on Y through mediator M as a linear function of the moderator. An inference as to whether or not the index is statistically different from zero serves as a formal test of moderation of the

Table 4.20. Indirect Effects of Supervisor Feedback Environment on Self-Development through mediators at specific levels of feedback orientation corresponding to Figure 4.16.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Feedback Orientation (W)</th>
<th>ω</th>
<th>seω</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Insight (M₁)</td>
<td>-0.61 (10th %ile)</td>
<td>2.40</td>
<td>0.77</td>
<td>1.14</td>
<td>4.17</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>2.37</td>
<td>0.69</td>
<td>1.24</td>
<td>3.98</td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>2.33</td>
<td>0.65</td>
<td>1.25</td>
<td>3.87</td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>2.31</td>
<td>0.66</td>
<td>1.21</td>
<td>3.88</td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>2.26</td>
<td>0.77</td>
<td>1.02</td>
<td>4.12</td>
</tr>
<tr>
<td>Need for Development (M₂)</td>
<td>-0.61 (10th %ile)</td>
<td>0.09</td>
<td>0.41</td>
<td>-0.74</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>-0.23</td>
<td>0.37</td>
<td>-1.17</td>
<td>0.34</td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>-0.60</td>
<td>0.40</td>
<td>-1.69</td>
<td>-0.04</td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>-0.81</td>
<td>0.45</td>
<td>-2.03</td>
<td>-0.16</td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>-1.29</td>
<td>0.62</td>
<td>-2.93</td>
<td>-0.34</td>
</tr>
</tbody>
</table>

Note. Values of feedback orientation are centered and presented at the 10th, 25th, 50th, 75th and 90th percentiles of the distribution of feedback orientation in the sample. M₁ = mediator variable; W = moderator variable; ω = size of the indirect effect; seω = the standard error of the effect; C.I. = 95% confidence interval.
indirect effect by the moderator in the model (Hayes, 2015). For need for development, the index was nonzero (index = -1.06, C.I. = -2.36 to -0.22), confirming with 95% certainty that there is a conditional indirect effect that is different from zero.

The confidence interval for the index of moderated mediation for career insight did include zero (index = -.10, C.I. = -1.45 to 1.08), and thus the index value cannot be considered different from zero. In other words, the indirect effect of the supervisor feedback environment on self-development through need for development only occurred for individuals with feedback orientation scores at or above 3.83. However, the indirect effect of the supervisor feedback environment on self-development through career insight occurred regardless of an individual’s feedback orientation. Feedback orientation interacted with the supervisor feedback environment to influence self-development by altering whether the indirect effect through need for development relates to self-development, but had no influence on the indirect effect through career insight.

A second pair of models was estimated to examine whether feedback orientation as a moderator of the $b$ path ($b'$) influenced the transmission of the supervisor feedback environment’s effect on self-development through the two mediators proposed in Hypotheses 3 and 5 (Figure 4.17). Feedback orientation as a moderator of the career insight-self-development and need for development-self-development relationships was explicitly tested in Hypotheses 11 and 12, respectively, and confirmed only for the career insight-self-development relationship (H11). Hayes (2013) PROCESS template Model 14 allows for the calculation of path estimates to determine whether the interactive effects of each mediator and the moderator influence the effect of the supervisor feedback environment on self-development through each mediator.
Results from model estimation are reported in Table 4.21 and indirect effect estimates are reported in Table 4.22. First, estimates for the $a$ paths between the supervisor feedback environment and the respective mediators were consistent with previously reported estimates: supervisor feedback environment was related to career insight ($a_1 = 0.44, p < .001$), but not to need for development ($a_2 = -0.02, p = .83$).

Second, consistent with Hypotheses 11, career insight (as affected by supervisor feedback environment) interacted with feedback orientation to predict self-development ($b_{31} = 6.77, p = .005$). Specifically, the interaction term for feedback orientation mirrored the pattern observed in Hypothesis 11, where the positive relationship between career insight and need for development was stronger at higher levels of feedback orientation, and was weaker and nonsignificant at lower levels of feedback orientation.

Conversely, the interaction between feedback orientation and need for development was nonsignificant ($b_{32} = -0.87, p = .45$). Third, both mediators and feedback orientation were positively and significantly related to self-development. Greater levels of career insight ($b_{11} = 5.32, p = .003$), need for development ($b_{12} = 1.62, p = .04$), and feedback orientation ($b_2 = 15.79, p < .001$) were associated with more self-development activity.

Interestingly, supervisor feedback environment had no direct effect on self-development in this model ($c’ = -0.50, p = .79$), indicating that any effect of the supervisor feedback environment on self-development would have to be indirectly through its association with the two mediators.
Figure 4.17. Conceptual and statistical depictions of PROCESS Model 14 template (Hayes, 2013) for Research Question 2 reflecting feedback orientation as a $b$ path moderator of the indirect effect of supervisor feedback environment on self-development through career insight and need for development.
Table 4.21. Path analytic results from conditional indirect effect of supervisor feedback environment on self-development with feedback orientation as a $b$ path moderator (Research Question 2).

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>$M_1$ (Career Insight)</th>
<th>$M_2$ (Need for Development)</th>
<th>$Y$ (Self-Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff</td>
<td>SE</td>
<td>$p$</td>
</tr>
<tr>
<td>$X$ (Supervisor Feedback Environment)</td>
<td>$a_1$</td>
<td>0.44</td>
<td>0.05</td>
</tr>
<tr>
<td>$M_1$ (Career Insight)</td>
<td>$b_{11}$</td>
<td>5.32</td>
<td>1.79</td>
</tr>
<tr>
<td>$V$ (Feedback Orientation)</td>
<td>$b_2$</td>
<td>15.78</td>
<td>2.34</td>
</tr>
<tr>
<td>$M_1 V$</td>
<td>$b_{31}$</td>
<td>6.77</td>
<td>2.42</td>
</tr>
<tr>
<td>Constant</td>
<td>$b_{41}$</td>
<td>-1.72</td>
<td>0.18</td>
</tr>
</tbody>
</table>

$R^2 = 0.18$, $F(1, 420) = 91.55, p < .001$; $R^2 = 0.00$, $F(1, 420) = 0.05, p < .001$; $R^2 = 0.22$, $F(6, 415) = 19.52, p < .001$.

Note: Values of feedback orientation are centered and presented at the 10th, 25th, 50th, 75th and 90th percentiles of the distribution of feedback orientation in the sample. $M_i$ = mediator variable; $V$ = moderator variable; $M_i V$ = interaction term; $Y$ = dependent variable. Reported coefficients are unstandardized.

Table 4.22. Indirect Effects of Supervisor Feedback Environment on Self-Development at specific levels of Feedback Orientation as a $b$ path Moderator.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Feedback Orientation ($V$)</th>
<th>$\omega$</th>
<th>$se_\omega$</th>
<th>C.I. Lower</th>
<th>C.I. Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Insight ($M_1$)</td>
<td>-0.61 (10th %ile)</td>
<td>0.51</td>
<td>0.99</td>
<td>-1.41</td>
<td>2.50</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>1.39</td>
<td>0.83</td>
<td>-0.14</td>
<td>3.12</td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>2.43</td>
<td>0.83</td>
<td>0.92</td>
<td>4.20</td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>3.02</td>
<td>0.94</td>
<td>1.34</td>
<td>5.04</td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>4.35</td>
<td>1.32</td>
<td>1.97</td>
<td>7.12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Need for Development ($M_2$)</th>
<th>Feedback Orientation ($V$)</th>
<th>$\omega$</th>
<th>$se_\omega$</th>
<th>95% C.I. Lower</th>
<th>95% C.I. Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.61 (10th %ile)</td>
<td>-0.05</td>
<td>0.28</td>
<td>-0.79</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>-0.04</td>
<td>0.24</td>
<td>-0.65</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>-0.03</td>
<td>0.21</td>
<td>-0.57</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>-0.03</td>
<td>0.19</td>
<td>-0.57</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>-0.02</td>
<td>0.19</td>
<td>-0.65</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Note: Values of feedback orientation are centered and presented at the 10th, 25th, 50th, 75th and 90th percentiles of the distribution of feedback orientation in the sample. $M_i$ = mediator variable; $V$ = moderator variable $\omega$ = size of the indirect effect, $se_\omega$ = the standard error of the effect. C.I. = 95% confidence interval.
Finally, to understand whether or not the indirect effect of the supervisor feedback environment through career insight and need for development depended upon feedback orientation’s moderating effect on the \( b \) paths, the conditional indirect effects were estimated at the 10\(^{th}\), 25\(^{th}\), 50\(^{th}\), 75\(^{th}\), and 90\(^{th}\) percentiles of feedback orientation in the sample, and Bootstrapped confidence intervals were calculated to determine whether or not the estimated effect was nonzero. If the indirect effects are consistently nonzero or consistently zero throughout the range of feedback orientation values, it can be concluded that there was not evidence of a conditional indirect effect. Conversely, if the indirect effect was zero at some levels of feedback orientation, and nonzero at other levels, there would be evidence that the indirect effect was dependent upon feedback orientation.

Estimates of the two indirect effects at corresponding percentiles of feedback orientation are presented in Table 4.22. An examination of the patterns of confidence intervals revealed that the indirect effect of supervisor feedback environment on self-development through need for development was not contingent upon feedback orientation as a \( b \) path moderator—the indirect effect was no different from zero at any level of feedback orientation, suggesting no indirect effect existed. However, the indirect effect of supervisor feedback environment through career insight was dependent upon feedback orientation. At levels of feedback orientation greater or equal to the 50\(^{th}\) percentile in the sample (\( V = 3.85 \)), the indirect effect of supervisor feedback environment on need for development through career insight was positive and different from zero (\( \omega = 2.43 \), C.I. = 0.92 to 4.20), while at feedback orientation levels below the 50\(^{th}\) percentile of the sample, the estimated effect was essentially no different from zero.
The index of moderated mediation (Hayes, 2015) confirmed that the effect of feedback orientation on the indirect effect through career insight was statistically nonzero (index value = 2.96, C.I. = .72 to 5.60), while the need for development effect was not statistically different from zero (index value = 0.03, C.I. = -0.22 to 0.61). Although there was no indirect effect of supervisor feedback environment on self-development through need for development as modeled, it can be concluded that the indirect effect of supervisor feedback environment on self-development through career insight was conditional upon the level of feedback orientation as modeled on the b path.

**Feedback Orientation as a Dual-Path Moderator**

The final feedback orientation moderation model depicted in Figure 1.1 allows for feedback orientation to moderate all a and b paths simultaneously. In other words, this model estimates whether the interactive effects of supervisor feedback environment and feedback orientation on career insight and on need for development influenced the interactive effect of career insight-feedback orientation and need for development-feedback orientation on self-development. A conceptual and statistical depiction of Model 58, used to estimate feedback orientation as a 2-stage moderator, is presented in Figure 4.18.

Results from the estimation of this model are presented in Table 4.23. First, supervisor feedback environment was related to both career insight \(a_{11} = 0.28, p < .001\) and need for development \(a_{12} = -0.23, p = .04\), although the relationship with need for development was negative. Feedback orientation was also a significant, positive predictor of career insight \(a_{21} = 0.38, p < .001\) and of need for development \(a_{22} = 0.42, p = .002\).
Figure 4.18. Conceptual and statistical depictions of Hayes (2013) parallel mediator model, with both $a$ and $b$ paths moderated, as applied to the present study.
Table 4.23. Path analytic results for the conditional indirect effects of supervisor feedback environment on self-development, through career insight and need for development, with feedback orientation as a moderator of both $a$ and $b$ paths.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>Coeff</th>
<th>SE</th>
<th>$p$</th>
<th>Coeff</th>
<th>SE</th>
<th>$p$</th>
<th>Coeff</th>
<th>SE</th>
<th>$p$</th>
<th>Coeff</th>
<th>SE</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X$ (Supervisor Feedback Environment)</td>
<td>$a_{11}$</td>
<td>0.28</td>
<td>0.05</td>
<td>$&lt; .001$</td>
<td>$a_{12}$</td>
<td>-0.23</td>
<td>0.11</td>
<td>.04</td>
<td>$c'$</td>
<td>-0.50</td>
<td>1.85</td>
<td>.79</td>
</tr>
<tr>
<td>$M_1$ (Career Insight)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>$b_{11}$</td>
<td>5.32</td>
<td>1.79</td>
</tr>
<tr>
<td>$M_2$ (Need for Development)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>$b_{12}$</td>
<td>1.62</td>
<td>0.79</td>
</tr>
<tr>
<td>$W$ (Feedback Orientation)</td>
<td>$a_{21}$</td>
<td>0.38</td>
<td>0.06</td>
<td>$&lt; .001$</td>
<td>$a_{22}$</td>
<td>0.42</td>
<td>0.13</td>
<td>.002</td>
<td>$b_2$</td>
<td>15.78</td>
<td>2.33</td>
<td>$&lt; .001$</td>
</tr>
<tr>
<td>$XW$</td>
<td>$a_{31}$</td>
<td>-0.01</td>
<td>0.07</td>
<td>.86</td>
<td>$a_{32}$</td>
<td>-0.43</td>
<td>0.16</td>
<td>.006</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>$M_1W$</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>$b_{31}$</td>
<td>6.77</td>
<td>2.42</td>
</tr>
<tr>
<td>$M_2W$</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>$b_{32}$</td>
<td>-0.87</td>
<td>1.16</td>
</tr>
<tr>
<td>Constant</td>
<td>$i_{11}$</td>
<td>0.00</td>
<td>0.03</td>
<td>.95</td>
<td>$i_{12}$</td>
<td>0.07</td>
<td>0.06</td>
<td>.31</td>
<td>$i_y$</td>
<td>36.17</td>
<td>1.02</td>
<td>$&lt; .001$</td>
</tr>
</tbody>
</table>

$R^2 = .25 \quad F(3, 418) = 46.60, p < .001 \quad R^2 = .04 \quad F(3, 418) = 6.15, p < .001 \quad R^2 = .22 \quad F(6, 415) = 19.52, p < .001$

Note. $X$ = independent variable; $M_1$ = mediator variable; $W$ = moderator variable; $XW = a$ path interaction term; $M_1W = b$ path interaction term $Y = dependent variable. Reported coefficients are unstandardized.

The interaction of the supervisor feedback environment and feedback orientation was significantly related to need for development ($a_{32} = -0.43, p = .006$), but not career insight ($a_{31} = -0.01, p = .86$), and this pattern is consistent with the results of Hypotheses 9 and 10 and previously estimated models for Research Question 2.

Several paths relating to self-development were also significant. First, career insight ($b_{11} = 5.32, p = .003$), need for development ($b_{12} = 1.62, p = .04$), and feedback orientation ($b_2 = 15.78, p < .001$) were all related to self-development. Additionally, feedback orientation interacted with career insight to predict self-development ($b_{31} = 6.77, p = .005$), but did not interact with need for development to predict self-development ($b_{32} = -0.87, p = .45$), consistent with results presented for Hypothesis 11 and 12, and with the results for Model 14 estimated for this research question.
Interestingly, when the main and interactive effects described above were included in the model predicting self-development along with the direct effect of supervisor feedback environment, the effect of the supervisor feedback environment was not statistically significant ($c' = -0.50, p = .79$), suggesting there was no direct effect of supervisor feedback environment on self-development when feedback orientation was allowed to moderate both $a$ and $b$ paths of the two indirect effects. Taken together, it appears that feedback orientation moderates the $a$ path of the indirect effect of supervisor feedback environment on self-development through need for development, and moderates the $b$ path of the indirect effect of supervisor feedback environment on self-development through career insight.

With regards to the conditional indirect effects, the estimates for the indirect effects through career insight and need for development, at different levels of feedback orientation are presented in Table 4.24. Again, estimates for the indirect effects were calculated at the 10th, 25th, 50th, 75th and 90th percentiles of feedback orientation. The indirect effect through career insight was non-significant at the 10th and 25th percentiles of feedback orientation, but switched to significance at the 50th percentile ($W = 3.85$, C.I. = .61 to 2.96). Therefore, it can be concluded that the indirect effect of supervisor feedback environment on self-development through career insight was dependent upon the strength of feedback orientation at both stages of the indirect effect.
Table 4.24. Inference for the conditional indirect effect of supervisor feedback environment on self-development through career insight and need for development.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Feedback Orientation (W)</th>
<th>ω</th>
<th>se_ω</th>
<th>C.I. Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Insight (M₁)</td>
<td>-0.61 (10th %ile)</td>
<td>0.34</td>
<td>0.67</td>
<td>-0.83</td>
<td>1.81</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>0.91</td>
<td>0.58</td>
<td>-0.03</td>
<td>2.26</td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>1.56</td>
<td>0.58</td>
<td>0.61</td>
<td>2.96</td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>1.93</td>
<td>0.67</td>
<td>0.88</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>2.72</td>
<td>1.09</td>
<td>1.02</td>
<td>5.38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feedback Orientation (W)</th>
<th>ω</th>
<th>se_ω</th>
<th>C.I. Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for Development (M₂)</td>
<td>-0.61 (10th %ile)</td>
<td>0.08</td>
<td>0.37</td>
<td>-0.5120</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>-0.17</td>
<td>0.28</td>
<td>-0.9313</td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>-0.39</td>
<td>0.30</td>
<td>-1.2128</td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>-0.47</td>
<td>0.36</td>
<td>-1.4748</td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>-0.54</td>
<td>0.69</td>
<td>-2.2209</td>
</tr>
</tbody>
</table>

Note: Values of feedback orientation are centered and presented at the 10th, 25th, 50th, 75th and 90th percentiles of the distribution of feedback orientation in the sample. Mᵢ = mediator variable; W = moderator variable; ω = size of the indirect effect; se_ω = the standard error of the effect; C.I. = 95% confidence interval.

The indirect effect through need for development was not significantly different from zero at any level of feedback orientation, as all of the confidence intervals included zero (Table 4.24). Interestingly, with both of these indirect effects included in the model, the direct effect of supervisor feedback environment on self-development was not statistically significant (c’ = -0.50, p = .79). In conclusion, when feedback orientation is allowed to moderate both paths of the indirect effects, only the indirect effect through career insight significantly relates to self-development, and the direct effect observed in other models (i.e., when feedback orientation is modeled as an a path moderator only) disappears completely.

The preceding analyses intended to answer two research questions. First, when all mediators are considered together, what are the direct and indirect effects of the

137
supervisor feedback environment on self-development? Second, are these indirect effects conditional? With regard to the first question, the analyses suggest that career insight is the most important mediator of the feedback environment-self-development relationship. When directly compared to paths through other mediators, the indirect effect through career insight was consistently different from zero, positive, and larger than other effects. Interestingly, the serial indirect effects were not significantly different from zero in either model, although indirect effects through feedback seeking were generally positive and significantly different from zero.

For the second question, results from the variety of models suggest that each of the indirect effects may be conditional in different ways. Specifically, the indirect effect through career insight was conditional when feedback orientation was modeled as a $b$-path moderator and as a dual-path moderator, with lower levels of feedback orientation associated with an indirect effect no different from zero, and higher levels of feedback orientation associated with a positive indirect effect. When feedback orientation was an $a$-path moderator, the indirect effect through career insight was consistently positive and non-zero regardless of feedback orientation level. The indirect effect through need for development was conditional upon feedback orientation as an $a$-path moderator, and did not exist when feedback orientation as modeled as a $b$-path moderator, nor as a dual-path moderator. The indirect effect through feedback seeking was unconditionally positive when feedback orientation was modeled at the $b$-path, and was no different from zero with feedback orientation as an $a$-path moderator or a dual-path moderator.
Table 4.25. Summary of analyses, tables, and figures corresponding to each research question.

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Table</th>
<th>Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 parallel mediators</td>
<td>4.13, 4.14</td>
<td>4.11, 4.12</td>
</tr>
<tr>
<td>1 3 parallel mediators</td>
<td>A.1, A.2</td>
<td>A.1</td>
</tr>
<tr>
<td>1 Serial model 1 (FSB-CI; Alternative FSB in Appendix A)</td>
<td>4.15, 4.16</td>
<td>4.13, 4.14</td>
</tr>
<tr>
<td>1 Serial model 2</td>
<td>4.17, 4.18</td>
<td>4.15</td>
</tr>
<tr>
<td>2 a-path moderation 2 mediators</td>
<td>4.19, 4.120</td>
<td>4.16</td>
</tr>
<tr>
<td>2 a-path moderation 3 mediators</td>
<td>A.5, A.6</td>
<td>A.3</td>
</tr>
<tr>
<td>2 b-path moderation 2 mediators</td>
<td>4.21, 4.22</td>
<td>4.17</td>
</tr>
<tr>
<td>2 b-path moderation 3 mediators</td>
<td>A.7, A.8</td>
<td>A.4</td>
</tr>
<tr>
<td>2 Dual path moderation 2 mediators</td>
<td>4.23, 4.24</td>
<td>4.18</td>
</tr>
<tr>
<td>2 Dual path moderation 3 mediators</td>
<td>A.9, A.10</td>
<td>A.5</td>
</tr>
</tbody>
</table>
CHAPTER V

DISCUSSION

Research exploring motivation for employee development in organizations has been prevalent over the last couple of decades. However, with a strong emphasis on formalized training and organizational development activities and interest in understanding affective and motivational influences of participation, examinations of self-development from a performance management perspective have been scarce. The modern employment context places less value on formalized training and education and more emphasis on independent learning and growth. Despite a greater emphasis on employee self-sufficiency, organizations can still play a role in employee development. There is great advantage for organizations in supporting self-development, especially if support can be provided through pre-existing mechanisms within the organization. Specifically, as the feedback environment has a known effect on employee wellbeing and performance, understanding the effects of the supervisor feedback environment on developmental outcomes adds another reason to cultivate favorable supervisor feedback environments as a broader performance management goal. Although authors have touched on the idea in theory (e.g., London et al., 1999), the present study endeavored to explicitly examine the supervisor feedback environment as it relates to employee self-
development and to understand the conditions where a favorable feedback environment is most likely to increase self-development.

**Summary of Results**

With regard to the relationship between the supervisor feedback environment and self-development, results from several analyses supported the hypothesis that a favorable supervisor feedback environment positively relates to self-development (H1, H3). Employees with a credible supervisor feedback source who provides high-quality positive and negative feedback, and who delivers feedback in a considerate and supportive manner, were more likely to report engaging in a variety of self-development activities in the last year. Additionally, career insight was an important mediator of this relationship (H2, H3). Employees experiencing favorable feedback environments reported greater career insight, and in turn, were more likely to participate in self-development activities than employees with lower career insight scores.

The roles of both perceived need for development and feedback seeking in the supervisor feedback environment-self-development relationship were not as hypothesized. Feedback seeking was not influential as a mediator of the effect of a positive supervisor feedback environment on career insight, nor on need for development (H6, H7). That is, a favorable supervisor feedback environment did not result in greater career insight or greater perceived need for development as a result of increased feedback seeking. Similarly, need for development did not transmit the effects of a favorable supervisor feedback environment to increased participation in self-development, and was completely unrelated to supervisor feedback environment (H4, H5).
Finally, feedback orientation moderated both the supervisor feedback environment-need for development and career insight-self-development relationships, although the patterns between the two analyses were not consistent (H10, H11). High levels of feedback orientation were associated with a stronger, negative relationship between the supervisor feedback environment and need for development, and a stronger, positive relationship between career insight and self-development. At lower levels of feedback orientation, these relationships did not exist. Feedback orientation was not found to moderate the supervisor feedback environment-career insight relationship, nor the need for development-self-development relationship (H9, H12). Feedback orientation also had no effect on the supervisor feedback environment-feedback seeking relationship (H8). Additionally, a self-directed attitude was positively related to career insight as predicted (H13), but played no moderating role in the need for development-self-development relationship (H14).

In a series of exploratory analyses, the present research provided additional clarity about the relative strength and conditionality of the hypothesized indirect effects. Consistent with other results, the indirect path between the supervisor feedback environment and self-development through career insight was stronger than paths through other mediated variables, consistently showing the strongest indirect effect. Serial mediation analyses examining the indirect effects of the supervisor feedback environment on self-development through feedback seeking’s effect on a second variable (i.e., career insight or need for development) were consistently not different from zero; however, feedback seeking alone demonstrated some value as a mediator of the effect of supervisor
feedback environment on self-development (i.e., results in Tables 4.15 and 4.17; see Appendix A for additional analyses).

The conditionality of these indirect effects was also examined through a series of analyses. As suggested by the results of hypothesis tests, the indirect effect of supervisor feedback environment on self-development through career insight appears to be dependent upon individuals having high levels of feedback orientation, but only when feedback orientation was modeled as a moderator of the second path in the indirect effect. The converse was true for need for development: the indirect effect of supervisor feedback environment through need for development and onto self-development was conditional upon feedback orientation as a moderator of the first leg of the indirect path. When both paths were moderated simultaneously, the direct effect of the supervisor feedback environment was actually reduced to nothing. In other words, the effect of the supervisor feedback environment on self-development only existed as an indirect effect when both paths were moderated by feedback orientation.

The purpose of the present research was threefold. First, this study sought to extend the realm of the supervisor feedback environment research by including self-development as a new outcome. Second, the present study identified mediating variables from the employee development literature that could explain the supervisor feedback environment’s proposed influence on self-development behavior. Finally, the third goal was to understand the conditions that might enhance or limit the effect of the supervisory feedback relationship on employees’ self-development behavior. Each of these goals will be discussed in turn.
The Relationship between the Feedback Environment and Self-Development

A major goal of the present study was to explore whether the supervisor feedback environment meaningfully relates to employee self-development. The review of the literature revealed that many authors have exclusively viewed the role of organizations in employee development as provider of emotional or material support, a provider of development options, or a provider of rules and structure that may or may not support development (Hurtz & Williams, 2009; Maurer & Tarulli, 1994; Maurer et al., 2003; Orvis & Leffler, 2011). One common recommendation for improving participation in development has been to make employees more aware of opportunities and to show support for employee self-development (e.g., Hurtz & Williams, 2009). Keeping findings from relevant self-development research in mind, the present study sought to take this recommendation further by examining the qualities of the organizational environment that facilitate information sharing and awareness for performance and improvement.

Results from the study suggest that consistent with expectations, a favorable supervisor feedback environment is linked with higher levels of self-development behavior. The observed positive relationship between the supervisor feedback environment and self-development expands the growing list of benefits associated with supportive supervisory feedback relationships at work. When the supervisor feedback environment is favorable, employees tend to have better job performance, are more likely to perform OCBs, feel more committed to their organizations, are less likely to experience role stress and burnout, and are more likely to understand work standards, to feel satisfied, to feel in control over their work, and to feel empowered (Anseel & Lievens, 2007; Gabriel et al., 2014; Linderbaum & Levy, 2010; Rosen et al., 2006;
Whitaker et al., 2007; Sparr & Sonnentag, 2008). Beyond the aforementioned desirable employee states and work outcomes, findings from this study suggest that a favorable supervisor feedback environment may help employees to direct attention towards self-development, and thus build human capital potential that could benefit both employees and organizations in the future (Noe, 2005). In sum, the overarching goal of the study was achieved by empirically linking the supervisor feedback environment to self-development.

**Mediators of the Supervisor Feedback Environment-Self-Development Relationship**

In addition to establishing the positive relationship between the supervisor feedback environment and self-development, a second purpose of the present study was to examine mechanisms that might theoretically and empirically explain a relationship between the supervisor feedback environment and self-development. Two mediating variables that extant research suggested could facilitate the effect were included: career insight, and need for development. Both career insight and need for development have been empirically tied to participation in development and were hypothesized to mediate the supervisor feedback environment’s effect on self-development. Feedback seeking was expected to mediate the supervisor feedback environment’s relationships with career insight and need for development.

**Career Insight**

Notably, a favorable supervisor feedback environment was related to career insight, operationalized as an employee’s self-evaluation of his or her understanding of career-related strengths and weaknesses, and having clear and realistic career goals. This relationship with career insight was also integral to understanding how the supervisor
feedback environment related to self-development. Across analyses, the route through career insight was consistently the strongest indirect path linking the supervisor feedback environment to self-development, further supporting the idea that knowing what to develop is key to actually engaging in development (DeVos & Soens, 2008).

Feedback serves as an informational resource that can help employees better understand their strengths and weaknesses, help them to set realistic goals, and assess progress towards those goals (Gregory et al., 2011; Lord & Levy, 1994; London et al., 1999; Taylor et al., 1984). Findings in the present study suggest that employees who experience a favorable supervisor feedback environment are more likely to be in-tune with their career goals and capabilities, and to do things that facilitate the expansion of their career-related knowledge, skills, and abilities. Although the present research does not allow for a confident conclusion that these correlates occur in a causal pattern, this finding is a step in the right direction.

Need for Development

Need for development was hypothesized to be positively related to the supervisor feedback environment and to play a prominent role in carrying the influence of the supervisor feedback environment to self-development. Based upon the idea that the availability of quality feedback would increase perceived need for development by drawing attention to differences between present-state skills and abilities and goal-state skills and abilities (e.g., control theory), and evidence that a clear working knowledge of one’s own strengths and weaknesses was related to self-development (e.g., Maurer & Tarulli, 1994), the present research proposed that perceived need for development was an
important mediator of the supervisor feedback environment-self-development relationship.

Interestingly, the supervisor feedback environment was unrelated to perceived need for development. In fact, need for development was unrelated to most of the variables measured in the present study (see Table 4.1). Feedback theories rooted in control theory and principles of self-regulation argue that when information about performance is widely available, recipients should direct attention to areas where additional development is necessary to meet expectations (Taylor et al., 1984). Findings from the present study did not support these hypotheses, and essentially suggest that the supervisor feedback environment had no effect on perceiving a need for development. However, there are plausible reasons why this may have been the case.

One potential explanation for the unsupported hypothesis could be that the supervisor feedback environment-need for development relationship is actually more complicated. Specifically, in order for the feedback environment to influence an employee’s need for development, he or she needs to “pick up” on the cues provided by the supervisor and mindfully process that information in order to report having some developmental need. Findings from the present study supported this explanation: subsequent analyses revealed that the relationship was moderated by feedback orientation. However, at high levels of feedback orientation the relationship between supervisor feedback environment and need for development was negative, rather than positive, providing only partial support for this explanation. In other words, if low levels of feedback orientation were associated with lower, rather than higher self-rated need for development, it could be hypothesized that the reason for the non-existent relationship
between supervisor feedback environment and need for development was employees’ failure to perceive a need at low levels of feedback orientation. Because this pattern was actually the opposite, and those with higher levels of feedback orientation perceived lower rather than greater need for development, it is unlikely the lack of relationship was related to employee feedback orientation in this manner.

A second possibility is that need for development was capturing something other than intended. That is, it could be people who are highly feedback oriented, who also experienced a favorable supervisor feedback environment, interpreted the item wording of the need for development scale as remedially-focused, rather than growth-focused, and reacted by endorsing responses that aligned with that interpretation. The tone of the three items that comprise the scale use language that could have been interpreted as severe, for example, “I have been in real need of career related skill or knowledge improvement.” In this case, need for development, as operationalized, may have actually tapped into a person’s perception that they are lacking in some way, rather than a person’s perception that there areas where skill growth or improvement could be a competitive advantage. If this is the case, then the need for development measure may have captured more about respondent’s attitudes about the purpose of development more so than an assessment of need for development.

Although the scale’s use in previous research resulted in growth-oriented, positive correlations with other development variables (e.g., Maurer et al., 2003), it is plausible that participants’ interpretation of these items was not in line with the intended growth-focused connotation of need for development employed in the present study’s hypotheses. If that were the case, it could be that the low need for development scores
were the result of a halo effect; that is, if a person answered in the affirmative about the positive qualities of the work environment and about his or her own receptivity to feedback, the general feeling of positivity about the workplace might lead him or her to also deny any shortcomings. The observation of similarly negative relationships between need for development and other positive constructs would have provided evidence for this particular argument. Unfortunately, the correlations between need for development and other study variables presented in Chapter IV are small or nonexistent, making this explanation unlikely.

A third explanation is that an individual difference that was not captured in the present study may explain the absent relationship between supervisor feedback environment and need for development. Specifically, it is conceivable that at extreme ends of the spectrum, some employees may never perceive the need to improve job-related skills or capabilities, while other employees constantly see areas of their work that could benefit from additional developmental attention. One candidate could be implicit person theory (IPT), which refers to the extent to which an individual believes that personal traits and abilities are malleable (Dweck, Chiu, & Hong, 1995; Heslin, VandeWalle, & Latham, 2006). Individuals who believe that traits or abilities can change are considered to have an incremental IPT, and those who believe that traits and abilities are fixed are considered to have an entitist IPT. It would follow that, in a favorable supervisor feedback environment, employees with an entitist IPT would be less likely to report a need for development in part due to their belief that they cannot be developed. Therefore, even if the supervisor feedback environment was very supportive, individuals with an entitist IPT would be less likely to report a need for development.
Differences in goal orientation, a trait that has been shown to influence types of goals people set and how they approach development (VandeWalle, 1997), could also play a role in understanding why a favorable feedback environment might not relate to perceiving developmental need. Individuals who are considered learning goal oriented tend to engage in more activities related to general learning or improvement than do those who are primarily task or mastery-oriented, who tend to prefer demonstrating competence and achieving success on specific tasks. Learning goal oriented individuals might generally be more prone to seeing opportunities for development than their mastery oriented peers, regardless of the quality of the supervisor feedback environment. Although these constructs were not included in the present study, future research examining the relationship between the supervisor feedback environment and need for development may benefit from including IPT or goal orientation.

A fourth possible explanation for the unexpected supervisor feedback environment-need for development finding is that the hypothesis was framed incorrectly. As described in Chapter 2, previous research suggested that when employees perceived a need for development they were more likely to participate in developmental activities, suggesting a positive, linear relationship between the two. Because a favorable supervisor feedback environment provides a rich feedback environment that is expected to make all kinds of information more available, it was hypothesized that a favorable supervisor feedback environment would be positively and linearly related to perceived need for development. This hypothesis assumes that the more feedback available, the more an employee would report having skills or abilities in need of development, with no upper limit on the benefits of more feedback. However, an employee could receive feedback
from a favorable supervisor feedback environment that actually reveals just the opposite: a favorable supervisor feedback environment could also lead an employee to believe that he or she does not have any developmental needs, as the feedback from the supervisor does not provide any indication that skills or abilities are lacking. That is, the relationship between the supervisor feedback environment and need for development may not be linear at all. More feedback may not inherently mean more developmental need, as the feedback could indicate that an individual is performing right on track with career-related development goals, or could reflect a diminishing return over time.

Similarly, the present study did not consider a more event-level or emergent approach to self-development. For instance an employee in a favorable supervisor feedback environment could perceive a need for development at one point, could take some action to resolve that discrepancy, and subsequently no longer perceive a need for development, despite no change in the quality of the supervisor feedback environment. In light of the present research, it might be beneficial for future cross-sectional research to examine whether the favorable supervisor feedback environment supports a more accurate view of developmental need, rather than greater developmental need. Specifically, a favorable supervisor feedback environment may result in greater agreement at a specific point in time between supervisor and employee about developmental needs, rather than perceiving that they need more development than an employee in an unfavorable supervisor feedback environment. Alternatively, future research could also conceptualize the relationship between the supervisor feedback environment and need for development as an emergent process.
Direct vs. Indirect Effects of the Supervisor Feedback Environment

In the presence of the mediated pathways, the direct effect of the supervisor feedback environment on self-development was often smaller than the indirect effects, suggesting that the supervisor feedback environment itself may not directly give rise to the positive effects on self-development behavior; rather, a favorable supervisor feedback environment likely provides individuals with information resources and a favorable relationship that affects employees’ tendency to seek feedback, to thoughtfully process feedback information, and to use that information to direct behavior. This interpretation aligns with the control theory conceptualization of feedback as a tool used to direct and self-regulate development behavior (e.g., Gregory et al., 2011) by suggesting that the processing of feedback information and subsequent activity related to that feedback are more likely to occur in the presence of a favorable supervisor feedback environment.

Ultimately, this study provides support for the assertion that a favorable supervisor feedback environment plays a meaningful role in supporting employees’ self-development. Furthermore, the finding that the relationship is in part due to employees having greater insight into their capabilities and goals reinforces that feedback processes, which serve to share this information, are an important aspect of employee coaching. In line with Aguinis’ (2013) definition of performance management as an approach intended to support employees’ long-term ability to change, adapt, and improve themselves, the present study provides broader evidence that the quality of the supervisor feedback environment is important to effective performance management through the link to self-development.
Boundary Conditions of a Favorable Feedback Environment

A third goal of the present study was to examine how personal characteristics, specifically, feedback orientation and self-directedness, influence the indirect relationships between supervisor feedback environment and self-development. Previous research has demonstrated limits to the effectiveness of the supervisor feedback environment, as individuals differ greatly in their comfort and capability digesting and applying feedback information and are not passive players in the feedback process (Gabriel et al., 2014; Ilgen et al., 1979; Linderbaum & Levy, 2010). Consistent with expectations, feedback orientation played an important role, resulting in a more nuanced understanding of the way in which the supervisor feedback environment and self-development are related.

First, feedback orientation and the supervisor feedback environment interacted in a surprising way: although the bivariate relationship between supervisor feedback environment and need for development was actually zero, analyses revealed that, for employees with higher feedback orientation scores, there was actually a negative relationship between supervisor feedback environment and need for development. Employees high in feedback orientation who experienced favorable feedback environments perceived less need for development than did employees with higher feedback orientation scores and less favorable feedback environments.

One reason for this unexpected pattern of results could be that when highly feedback oriented employees have also consistently experienced a favorable supervisor feedback environment, they may have also taken consistent action to develop over time, and therefore may not have perceived additional developmental need at the time they
participated in the study. As previously mentioned, the present study did not frame the relationship between the supervisor feedback environment and need for development as event-level or emerging over time, instead focusing on the expectation that a more favorable feedback environment makes feedback more widely available and allows employees to better understand and diagnose the extent of their developmental needs. Although this expectation was reasonable given previous research, the cross-sectional design of the study limited the opportunity to take participants’ history into consideration, for example, by modeling the effect of the present state after taking into account previous years’ perceived need for development. A highly feedback-oriented individual who experiences a favorable supervisor feedback environment could reasonably perceive that he or she does not have developmental needs in part because the needs have already been addressed.

Ultimately, feedback orientation proved to be important to understanding the role of need for development, and its influence translated to self-development behavior as well. Hypothesis 10 stated that having a favorable supervisor feedback environment and a strong tendency to seek and use feedback would result in greater perceived need for development as performance information was likely to be shared at greater levels between supervisor and employee. Instead, it appears that a strong feedback orientation provides more of a buffering effect in the absence of a favorable feedback environment than it does an amplification of the presence of one. The indirect effect of supervisor feedback environment on self-development through need for development was dependent upon feedback orientation, with a negative indirect effect present for individuals with high feedback orientation, and no indirect effect for those with low feedback orientation.
The negative indirect effect is again unexpected, but perhaps more importantly, highlights the pivotal role played by feedback orientation in this relationship. When feedback orientation is high, employees experiencing unfavorable supervisor feedback environments engage in more development than do their peers in favorable supervisor feedback environments. Feedback orientation may serve to buffer the effects of an unfavorable feedback environment by providing what employees need to direct their own development without supervisor influence. This could be due in part to the role of uncertainty. Previous research has found that a favorable supervisor feedback environment is associated with feeling more control over information and work decisions, and with decreased perceptions of ambiguity (Rosen et al., 2006; Sparr & Sonnentag, 2008). When feedback information is unavailable from a supervisor, someone who is feedback oriented may be more likely to seek out feedback from other sources and to engage in self-development as a way to feel more secure rather than be paralyzed by the uncertainty that can be characteristic of a poor supervisor feedback environment. Feedback-orientated individuals are more self-aware and feel greater self-efficacy processing feedback information (Linderbaum & Levy, 2010), and so may be more likely to act in the absence of a favorable supervisor feedback environment than their less feedback-oriented peers.

Feedback orientation also proved to be important to the role career insight played in the supervisor feedback environment-need for development relationship. As anticipated, higher levels of feedback orientation amplified the supervisor feedback environment-career insight relationship. Additionally, high feedback orientation served as a boundary condition for the indirect effect of supervisor feedback environment through
career insight. That is, a certain level of feedback orientation was necessary for the effect of the supervisor feedback environment to translate to self-development participation by way of greater career insight. At lower levels of feedback orientation, the indirect effect did not exist. Clearly, feedback orientation is beneficial to the relationship between the supervisor feedback environment and self-development.

It is also notable that when feedback orientation was added as a condition for the indirect effects explored in this study, the direct effect of the supervisor feedback environment essentially vanished (e.g., Table 4.20). This finding is not altogether surprising, as the indirect effects were hypothesized for a reason; however, that the direct effect becomes so weak in the context of feedback orientation highlights the importance of being feedback oriented in order for the positive benefits of a supervisor feedback environment to translate into self-development activity. Consistently, the pattern of conditional effects revealed that the hypothesized indirect effects did not exist at low levels of feedback orientation. In conclusion, the present research adds to a growing body of literature that demonstrates the value of a favorable feedback environment, while also elaborating the role that feedback orientation plays in the relationship between the feedback environment and important organizational outcomes.

**Implications, Limitations, and Future Research**

Findings from the present study provide a few implications for performance management research and practice. First, linking the supervisor feedback environment to self-development expands the realm of outcomes that are favorably influenced by strong supervisory feedback relationships. Theoretically, a favorable feedback environment should influence many parts of the performance management process beyond the
moments immediately following a feedback exchange (London & Smither, 2002). The present study provides some initial empirical evidence that a favorable supervisor feedback environment is related to increased participation in self-development. This is important, as performance management researchers are beginning to acknowledge a wider nomological network of constructs and metrics to be considered when evaluating organizational performance management practices and their effectiveness (DeNisi & Smith, 2014). As such, establishing a link between the quality of the feedback relationship and independent developmental activities undertaken by employees both expands this network and supports existing ideas about the value of the feedback environment through a control theory framework.

From a practical perspective, the present study strengthens the utility of feedback environment interventions by adding employee development outcomes to the list of potential benefits of a favorable feedback environment. Practitioners are increasingly focused on informal performance management processes as formal performance management systems continue to be heavily scrutinized by organizations and popular business media. With so many organizations attempting to increase the frequency with which supervisors and their direct reports discuss performance, practitioners focused on employee development may be able to capitalize on the momentum and couple performance management related efforts with employee development efforts. Results from the present study suggest that favorable supervisor feedback environments relate to greater levels of self-development activity in part because employees have better career insight. When employees have the information they need to manage their own development, they seem to be more likely to do so, taking some burden off of
organizations to provide these resources. Findings from this study suggest that practitioners can accomplish both the reform of performance appraisal and simultaneously provide improved support for self-development by encouraging better managerial feedback environments.

In order to reap the benefits, organizations might consider including training or coaching for supervisors to improve the quality of the feedback environments they provide to employees. Steelman et al. (2004) recommended using the Feedback Environment Scale as a diagnostic tool for managers, as the behavioral items make it ideal for coaching and developing managers to provide a better feedback environment for employees. In the same way that doing so was expected to facilitate performance improvement, to bolster performance management activities like performance appraisal with ongoing and continuous feedback conversations, and to provide employees with clarity about expectations and performance, coaching managers to provide a better feedback environment is likely to result in increased employee self-development, or at the very least, employees with greater career insight and greater tendency to seek feedback.

Providing managerial coaching to improve feedback delivery is likely far less expensive and can influence a broader set of organizational outcomes than investing in career- or function-specific formalized training and development programs for employees. These programs sometimes lack the individualization necessary to address every employee’s needs. Facilitating employees’ interest and participation in their own development can help employees to feel more engaged with and committed to the organization, in addition to facilitating individual performance improvements and
enhancing enterprise-wide human capital (Benson, 2006; Birdi et al., 1997; Ellinger, 2004; Lee & Bruvold, 2003). If developing better feedback environments can encourage self-development, organizations may be able to increase employee development without the costly investments associated with formalized programs. This is especially important for practitioners trying to support employee performance, well-being, and engagement while simultaneously coping with scarce and diminishing financial resources (Lee & Bruvold, 2003; O’Toole & Lawler, 2006).

Second, findings from the present study reinforce previous research from the vocational psychology literature about the importance of career insight for development. Maurer and colleagues (1994; 2003) repeatedly found that career insight played a meaningful role in predicting who participated in development activity. DeVos and Soens (2008) found that when career insight and self-management behaviors were considered as predictors of perceived employability and career satisfaction, only career insight seemed to matter. They concluded that engaging in a desirable behavior alone was insufficient for success—that action without insight was essentially ineffective.

Although the present study did not examine career insight in this context, findings corroborate this assertion, as career insight was influential in self-development participation, while need for development was not. These two mediators differed in that career insight as measured tapped into employees’ awareness of their career-related goals and the extent to which they had a good sense of where they stood compared to those goals. Across analyses, career insight was favorably related to self-development, and the effects were amplified when individuals with stronger career insight were also feedback oriented. Thus, the identification of career insight as one way the supervisor feedback
environment positively affects self-development in the present study, especially in the context of high levels of feedback orientation, adds to the performance management literature by providing one explanation for the relationship. In the future, it would be interesting to manipulate the supervisor feedback environment to see whether a favorable supervisor feedback environment can cause an employee to gain career insight that leads to self-development behavior. Specifically, employees with identical levels of career insight could be assigned to favorable vs. unfavorable feedback environment conditions, and career insight could be measured again after some time, along with an assessment of how many developmental opportunities were taken. If the results mirrored the present study’s findings there would be further evidence to suggest that a favorable supervisor feedback environment is a reason for observed differences in career insight, and subsequently, differences in self-development participation. The present study lays the groundwork for future research to more definitively demonstrate that the positive effects of a favorable supervisor feedback environment may be higher rates of employee self-development.

Third, the failure of the present study to find evidence that perceiving a need for development played a role in the relationship between the supervisor feedback environment and self-development should inform future research. Although hypotheses involving need for development were driven by extant research and theory, one possible explanation for the absence of findings could be that need for development was conceptually oversimplified. The relationship between the supervisor feedback environment and need for development was hypothesized to be linear and positive such that a favorable feedback environment would result in employees receiving more useful
feedback and greater perceived need for development; however, it is completely reasonable to expect that a favorable supervisor feedback environment could decrease perceptions of developmental need by confirming that an employee’s skills and abilities are on par with expectations for the job. The present research employed concepts and measurements that were established by other researchers examining motivation for development (e.g., Maurer et al., 2003; Maruer & Tarulli, 1994), and as previously described, hypotheses may not have accurately framed the true nature of the relationship. Ultimately, in the context of feedback exchanges, it may be more accurate to expect that a favorable supervisor feedback environment results in agreement between the supervisor and employee about the level and specific areas of need for development. In the future, considering alternative conceptualizations of developmental need (e.g., supervisor-employee agreement about developmental need) may result in a stronger observed relationship between the supervisor feedback environment, developmental need, and self-development activity.

Finally, the importance of feedback orientation cannot be overstated. Employees with greater career insight in the present study benefitted when they were also highly feedback oriented, as a strong feedback orientation amplified the positive effects of career insight on self-development. In the absence of a strong feedback orientation, there was no relationship between career insight and self-development. On the other hand, high levels of feedback orientation were associated with a negative relationship between the supervisor feedback environment and need for development, and at low levels of feedback orientation the relationship was non-existent. Employees with the highest levels
of feedback orientation and the most favorable supervisor feedback environments reported the lowest self-rated need for development.

Taken together, these results suggest that accounting for individual differences in general, and feedback orientation in particular, is critical to understanding how the feedback environment affects important work-related outcomes. In the present study, the nature of relationships changed from non-existent to negative or non-existent to positive depending upon employee feedback orientation consistent with the findings and conclusions of Gabriel et al. (2014). Additionally, indirect effects were dependent upon levels of feedback orientation. Stated another way, feedback orientation levels determined whether or not the supervisor feedback environment-self-development relationship was mediated through either career insight or need for development, and also determined whether that mediated/indirect effect was larger than the direct effect of the supervisor feedback environment.

Given the paucity of research addressing both the moderating role of feedback orientation in general, and the role of feedback in self-development in particular, this research contributes to the literature by providing a new example of the moderating power of feedback orientation for a valuable organizational outcome. Future research should further explore not only the interaction between feedback environment and feedback orientation, but also the extent to which a supportive feedback environment could alter an individual’s feedback orientation over time. London and Smither (2002) proposed that one benefit of a positive feedback environment could be that over time, employees become more receptive to feedback. Both theory and practice would benefit from a better understanding of how these constructs influence each other over time in the
context of employee self-development, an outcome that seems to benefit from both in the present study, but not always in tandem.

Practically speaking, findings from the present study reinforce the notion that a favorable supervisor feedback environment alone is not necessarily a cure-all to improve individual performance or increase motivation or participation in developmental activities. Feedback orientation played a pivotal role in shaping the relationship between the supervisor feedback environment and self-development, yet a great deal of emphasis in both research and practice seems to be focused on helping supervisors provide better feedback environments in a vacuum. As such, practitioners working in learning and development or performance management functions within organizations should not only prioritize developing supervisors to create better feedback environments, but should also focus on improving the extent to which employees are capable of receiving, processing, and using feedback. Stated simply, effort should be put into improving employee receptivity to feedback in tandem with improving supervisor feedback delivery. Offering training or coaching to employees to improve their receptivity to feedback could support both performance management efforts and employee development efforts. As the present study’s finding suggest, employees who are receptive to the feedback provided to them via a favorable supervisor feedback environment and who have a pretty good sense of their career goals are more likely to act on this information and participate in development on a voluntary basis. Future research should investigate the effects of training and developing employee feedback orientation as one way to improve performance management outcomes, including participation in voluntary development activities. For example, the development and assessment of a theoretically driven
intervention to improve feedback orientation would be an excellent addition to both the research and practice of performance management.

As with all research, the present study is not without its limitations. As discussed, need for development did not perform as expected, which could have been a result of the measure used and the way the items were phrased. Future research could consider an alternative measure of the same idea with a focus on growth-oriented phrasing to remedy this issue. In line with this concern, the feedback-seeking variable was also not as important as anticipated, as it was not a mediator of the supervisor feedback environment-need for development relationship nor the supervisor feedback environment-career insight relationship. The present study’s feedback seeking measure only asked participants about the extent to which they inquired about their performance, omitting other forms of feedback seeking. One possibility could be that a measure of feedback seeking that includes items tapping into both inquiry and monitoring could have improved the relationships in the present study by capturing a method of feedback seeking that is valuable to the self-development process.

From a methodological perspective, the cross-sectional, one-shot measurement of constructs could be viewed as a limitation in that the present study is unable to make causal inferences. Despite this limitation, the present study is the first to establish relationships among feedback-related constructs and employee development outcomes; thus, the present study does serve to expand the nomological network of both areas of research and provide valuable evidence that there is some meaningful overlap between variables in both areas. Another weakness of the present study was the inability to get data from supervisors, whose perspectives can often corroborate employee reports about
important on-the-job behaviors, including feedback seeking and performance, and are considered to be a more objective form of data. However, previous research (e.g., Kline, 2015; Orvis & Leffler, 2011) has suggested that supervisors are ill-equipped to identify voluntary development participation, as it often occurs outside of the office or without the supervisor’s knowledge. Additionally, as the majority of the hypotheses dealt with employee perceptions, the employee’s report of his or her own experiences likely carries more validity to answering the questions posited about the relationship and overlap between the perceptions, traits, and behaviors included in the present research.

**Conclusion**

In sum, the present research builds on existing performance management and employee development literature, and identifies new relationships upon which future research can build to continue generating knowledge about organizational factors that support employee self-development. A favorable supervisor feedback environment was related to more instances of self-development, and this occurred in part through greater career insight. Feedback orientation proved to be important as it amplified the positive relationship between career insight and self-development, and the negative relationship between supervisor feedback environment and need for development. Finally, exploratory analyses suggested that the indirect effects of the supervisor feedback environment on self-development through both career insight and need for development are contingent upon feedback orientation, but in different ways. Deploying the supervisor feedback environment as a tool to support self-development will likely have the intended results, especially for employees who are feedback oriented. Ultimately, improving
employee receptivity to feedback may have even greater effects, but more research is needed to support this conclusion.
REFERENCES


APPENDIX A

ADDITIONAL ANALYSES

Overview of Additional Analyses

The analyses presented in Appendix A are an extension of the analyses presented in Chapter IV. The primary purpose of the following analyses is to explore the role of feedback seeking as a mediator of the supervisor feedback environment-self-development relationship in ways that were not hypothesized in Chapter II or implied in Figure 1.1. In general, these analyses are a replication and extension of the analyses presented in Chapter IV, as the same approach used to explore the Research Questions is used here. After conducting initial planned analyses, there was an interest in being more inclusive in the scope of mediators, and so additional analyses including feedback seeking as a mediator along with career insight and need for development are presented here. First, all three constructs are analyzed as parallel mediators of the supervisor feedback environment-self-development relationship. Second, conditional indirect effects through the three mediators are examined when the $a$-path and $b$-path are moderated by feedback orientation, separately. Third, the conditional indirect effects of the supervisor feedback environment-self-development relationship are examined when both $a$ and $b$ paths are moderated.
Finally, all analyses including feedback seeking were re-examined using only the two items in the feedback seeking measure that specifically related to supervisor feedback seeking. Only one analysis generated a meaningfully different pattern of results from the 4-item measure presented throughout the present study, and it has been included within this Appendix in topic order.

**Indirect Effects**

As mentioned, a goal of these subsequent analyses was to understand the effects of mediators in a more inclusive way. A second parallel mediation model was defined and estimated that was nearly identical to the model estimated in Figure 4.12, but included feedback seeking. Although no relationship between feedback seeking and self-development was hypothesized or investigated, feedback seeking displayed significant small to medium bivariate relationships with both supervisor feedback environment and self-development ($r = .11$ and $r = .29$, respectively), and thus was included in this model for exploratory purposes. Results from estimating the model adding feedback seeking to the list of parallel mediators are presented in Table A.1 and depicted in Figure A.1.

Consistent with Hypothesis 3, the supervisor feedback environment was related to career insight ($a_1 = 0.44, p < .001$) and career insight carried its effect to self-development ($a_1b_1 = 3.30, C.I. = 1.98$ to $4.95$). Consistent with the results for Hypothesis 5, supervisor feedback environment did not influence need for development ($a_2 = -0.02, p = .83$), which did not transmit the effect to self-development ($a_2b_2 = -.05, C.I. = -.46$ to $.35$). The supervisor feedback environment was positively related to feedback seeking, consistent with findings presented in Hypotheses 6 and 7 ($a_3 = 0.22, p = .02$), and mediated the
supervisor feedback environment-self-development relationship ($a_3b_3 = .97$, C.I. = .32 to 1.88).

Overall, 2 of the 3 variables (career insight, feedback seeking) carried the indirect effect of supervisor feedback environment to self-development, and the total indirect effect was both positive and statistically different from zero ($ab_{\text{total}} = 4.22$, C.I. = 2.72 to 6.03). These findings support the notion that the variables included in this model collectively mediated the effect of supervisor feedback environment on self-development, although some variables were more influential in this process than others.

Figure A.1. Results for parallel multiple mediator analysis for Research Question 1. Note: standard errors for estimates are reported in parentheses. $c' = $ the direct path between supervisor feedback environment and self-development, holding the mediators constant. $c = $ the total effect of supervisor feedback environment on self-development, including both direct and indirect paths as designated. *$p < .05$, **$p < .001$. 
Table A.1. Model coefficients for the indirect effect of supervisor feedback environment on self-development through career insight, need for development, and feedback seeking, modeled as parallel mediators.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>M₁ (Career Insight)</th>
<th>M₂ (Need for Development)</th>
<th>M₃ (Feedback Seeking)</th>
<th>Y (Self-Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X (Supervisor Feedback Environment)</td>
<td>a₁ 0.44 0.05 &lt; .001</td>
<td>a₂ 0.10 0.002 0.02</td>
<td>a₃ 0.10 0.002</td>
<td>c' 3.79 1.77 .03</td>
</tr>
<tr>
<td>M₁ (Career Insight)</td>
<td>___ ___ ___ ___ ___ ___</td>
<td>___ ___ ___ ___ ___</td>
<td>___ ___ ___ ___</td>
<td>b₁ 7.56 1.73 &lt; .001</td>
</tr>
<tr>
<td>M₂ (Need for Development)</td>
<td>___ ___ ___ ___ ___ ___</td>
<td>___ ___ ___ ___ ___</td>
<td>___ ___ ___ ___</td>
<td>b₂ 2.08 0.79 .01</td>
</tr>
<tr>
<td>M₃ (Feedback Seeking)</td>
<td>___ ___ ___ ___ ___ ___</td>
<td>___ ___ ___ ___ ___</td>
<td>___ ___ ___ ___</td>
<td>b₃ 4.30 0.81 &lt; .001</td>
</tr>
<tr>
<td>Constant</td>
<td>b₄ 2.43 0.18 &lt; .001</td>
<td>b₅ 4.36 0.40 &lt; .001</td>
<td>b₆ 0.84 0.39 .03</td>
<td>b₇ 25.44 8.51 .003</td>
</tr>
</tbody>
</table>

R²₁ = 0.18
R²₂ = 0.00
R²₃ = 0.01
R²₄ = 0.17
F(1, 420) = 95.55, p < 0.001
F(1, 420) = 0.05, p = 0.83
F(1, 420) = 5.38, p = 0.02
F(4, 417) = 20.90, p < 0.001

Note. X = independent variable, Mᵢ = mediator variable, Y = dependent variable. Reported coefficients are unstandardized.

Table A.2. Indirect effects of supervisor feedback environment on self-development through 3 parallel mediators, and paired contrasts of the differences of paths corresponding to Figure A.1.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Effect</th>
<th>SE</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Insight (M₁)</td>
<td>3.30</td>
<td>0.89</td>
<td>1.98</td>
<td>4.95</td>
</tr>
<tr>
<td>Need for Development (M₂)</td>
<td>-0.05</td>
<td>0.25</td>
<td>-0.46</td>
<td>0.35</td>
</tr>
<tr>
<td>Feedback Seeking (M₃)</td>
<td>0.97</td>
<td>0.48</td>
<td>0.32</td>
<td>1.88</td>
</tr>
<tr>
<td>Total Indirect Effect</td>
<td>4.22</td>
<td>1.03</td>
<td>2.72</td>
<td>6.03</td>
</tr>
</tbody>
</table>

Paired Contrasts

<table>
<thead>
<tr>
<th>M₁-M₂</th>
<th>M₁-M₃</th>
<th>M₂-M₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect</td>
<td>3.34</td>
<td>2.33</td>
</tr>
<tr>
<td>SE</td>
<td>0.93</td>
<td>1.03</td>
</tr>
<tr>
<td>Lower</td>
<td>1.98</td>
<td>0.73</td>
</tr>
<tr>
<td>Upper</td>
<td>5.13</td>
<td>4.12</td>
</tr>
</tbody>
</table>

C.I. = 95% confidence interval. Reported coefficients are unstandardized.

Paired contrasts comparing the three indirect effects confirmed this conclusion, but also suggested meaningful differences between the two nonzero effects (Table A.2).

Specifically, Bootstrapped confidence intervals calculated for the paired contrast between each of the effects revealed meaningful differences between the indirect path including
need for development and the paths including the other two mediators, as the need for development path was not significant. Perhaps less obviously, there was also a meaningful difference between the path including career insight and the path including feedback seeking ($M_1 - M_3 = 2.33$, C.I. = 0.73 to 4.12). The difference between these effects was positive and nonzero, indicating that the indirect effect including career insight was larger than the indirect effect through feedback seeking.

Taken together, the results from the estimation of the model associated with Figure A.1 allow for a few conclusions about the nature of the relationship between the supervisor feedback environment and self-development. First, the relationship in total, including all effects modeled, was positive and meaningful, consistent with the message of the present study. The supervisor feedback environment had a notable, favorable effect on employee self-development, and the predictors in this model accounted for about 17% of the total variation in self-development.

Second, this effect was comprised of both direct and indirect components of varying size. The supervisor feedback environment is directly related to self-development, and holding all mediators constant, a one-unit increase in favorability of the supervisor feedback environment is associated with several additional development activities. With regard to indirect effects, need for development was not identified as a mediator, while both career insight and feedback seeking seem to be important for the supervisor feedback environment-self-development relationship. Career insight carried more of the indirect effect than did feedback seeking, however, both were associated with meaningful increases in self-development.
Alternative Feedback Seeking Measure

As previously mentioned, feedback seeking did not perform as expected in the present study. A second set of analyses used an alternative feedback seeking measure that only include two of the four items which were directed at understanding feedback seeking from the supervisor (i.e., supervisor feedback seeking). That is, the two items addressing feedback seeking from coworkers were omitted. The lone change in the pattern of results occurred for the examination of the serial indirect effect of supervisor feedback environment on self-development through supervisor feedback seeking and career insight.

Figure 4.14. Results from serial multiple mediator analysis for Research Question 1. Note: standard errors for estimates are reported in parentheses. $c'$ = the direct path between supervisor feedback environment and self-development, holding the mediators constant. $c$ = the total effect of supervisor feedback environment on self-development, including both direct and indirect paths as designated. *p < .05, ** p < .001.

Results from this model are presented in Table A.3. Regarding the model with the serial path including career insight as $M_2$ (Figure A.2), supervisor feedback environment was positively and significantly related to supervisor feedback seeking ($a_1 = 0.22$, $p = .02$), and to career insight ($a_2 = 0.43$, $p < .001$). Supervisor feedback seeking was positively related to self-development ($b_1 = 3.34$, $p < .001$), but had no effect on career
insight ($d_{21} = 0.03, p = .21$). Career insight was positively and significantly related to self-development ($b_2 = 7.37, p < .001$). With regard to indirect effects, supervisor feedback environment indirectly affected self-development through supervisor feedback seeking ($a_1b_1 = 1.45$, C.I. = 0.63 to 2.68), and through career insight ($a_2b_2 = 3.12$, C.I. = 1.46 to 5.12), but not through both supervisor feedback seeking and career insight ($a_1d_{21}b_2 = 0.09$, C.I. = -0.02 to 0.30). Thus, there was no evidence of a serial indirect effect, but further evidence of indirect effects of supervisor feedback environment on self-development through supervisor feedback seeking and career insight independently. This finding is consistent with results for Hypothesis 6, where there was no observed indirect effect of the supervisor feedback environment on career insight through feedback seeking, and to Research Question 1 where findings with the original feedback seeking measure are presented.

An examination of the paired contrasts between the three indirect effects revealed slight differences between results using the original feedback seeking measure and the supervisor feedback seeking measure. Here, paired contrasts confirmed that differences existed between the single mediator paths and the serial mediated path (Table A.4), as both effects including only one mediator were larger than the indirect effect including them both, consistent with findings reported previously. However, the indirect paths through feedback seeking and career insight were not meaningfully different from each other, a finding contrary to those presented in Chapter IV using the 4-item feedback seeking measure.

The supervisor feedback environment was also not directly related to self-development ($c' = 3.34, p = .07$), suggesting that the effect of the supervisor feedback
environment on self-development occurred exclusively through the two variables sharing variance with career insight and supervisor feedback seeking. These findings showed that the relationship included only significantly nonzero indirect components, as supervisor feedback environment related to self-development indirectly through feedback seeking and career insight individually, but not through the serial feedback seeking-career insight path.

Table A.3. Model coefficients for the indirect effect of supervisor feedback environment on self-development through career insight and supervisor feedback seeking, modeled as serial mediators.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>$M_1$ (Supervisor Feedback Seeking)</th>
<th>$M_2$ (Career Insight)</th>
<th>$Y$ (Self-Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff</td>
<td>SE</td>
<td>$p$</td>
</tr>
<tr>
<td>$X$ (Supervisor Feedback Environment)</td>
<td>$a_1$ 0.43 0.09 &lt; .001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M_1$ (Supervisor Feedback Seeking)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M_2$ (Career Insight)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>$i_{a1}$ 0.23 0.39 .56</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. $X =$ independent variable; $M_1 =$ mediator variable; $Y =$ dependent variable. Reported coefficients are unstandardized.
Table A.4. Indirect effects of supervisor feedback environment on self-development and paired contrasts between mediated paths estimated for serial mediation model including career insight (Figure 4.14).

<table>
<thead>
<tr>
<th>Indirect Paths</th>
<th>Effect</th>
<th>SE</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback Seeking ($M_1$)</td>
<td>1.45</td>
<td>0.51</td>
<td>0.63</td>
<td>2.68</td>
</tr>
<tr>
<td>Feedback Seeking and Career Insight ($M_1M_2$)</td>
<td>0.09</td>
<td>0.08</td>
<td>-0.02</td>
<td>0.30</td>
</tr>
<tr>
<td>Career Insight ($M_2$)</td>
<td>3.12</td>
<td>0.92</td>
<td>1.46</td>
<td>5.12</td>
</tr>
<tr>
<td>Total Indirect Effect</td>
<td>4.68</td>
<td>1.05</td>
<td>2.74</td>
<td>6.91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paired Contrasts</th>
<th>Effect</th>
<th>SE</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M_1-M_2M_2$</td>
<td>1.36</td>
<td>0.50</td>
<td>0.57</td>
<td>2.54</td>
</tr>
<tr>
<td>$M_1-M_2$</td>
<td>-1.67</td>
<td>1.08</td>
<td>-2.90</td>
<td>0.37</td>
</tr>
<tr>
<td>$M_1M_2-M_2$</td>
<td>-3.03</td>
<td>0.92</td>
<td>-5.02</td>
<td>-1.38</td>
</tr>
</tbody>
</table>

Note. $M_i$ = mediator variable. C.I. = 95% confidence interval. Reported coefficients are unstandardized.

**Conditional Indirect Effects**

Although feedback seeking was not explicitly hypothesized to affect self-development in the present study, its inclusion in exploratory analyses for Research Question 1 yielded interesting findings. To further explore the role that feedback seeking plays in the supervisor feedback environment-self-development relationship, analyses examining the moderation of the indirect effects by feedback orientation were conducted. First, an $a$-path conditional indirect effect model adding feedback seeking as the third parallel mediator, $M_3$, was estimated for exploratory purposes. Results are presented in Table A.5 and corresponding statistical model provided in Figure A.3.
Figure A.3. Statistical depiction of a-path moderation model including feedback seeking as a mediator of the supervisor feedback environment-self-development relationship.

Consistent with findings reported for Hypotheses 8-10 and the last model, feedback orientation moderated the supervisor feedback environment-need for development relationship ($a_{32} = -0.43$, $p = .006$), but did not moderate the supervisor feedback environment-career insight relationship ($a_{31} = -0.01$, $p = .86$), nor did it moderate the supervisor feedback environment-feedback seeking relationship ($a_{33} = 0.24$, $p = .11$). Although the effect of the supervisor feedback environment on both career insight and feedback seeking was not conditional on level of feedback orientation, feedback orientation was significantly and positively related to both mediators ($a_{21} = .38$, $p < .001$ and $a_{23} = .69$, $p < .001$, respectively). Interestingly, supervisor feedback environment was positively and significantly related to career insight, but was unrelated...
to feedback seeking \((a_{13} = -0.3, p = .75)\). This is inconsistent with some previous findings (i.e., Hypotheses 6, 7) but consistent with Hypothesis 8, which examined the moderating effect of feedback orientation on the supervisor feedback environment-feedback seeking relationship, suggesting that the addition of feedback orientation in the equation as a main effect dampened the predictive influence of the supervisor feedback environment.

To understand how the effect of feedback orientation altered the indirect effect of the supervisor feedback environment through the 3 mediators, values of the indirect effect through each mediator were estimated at the 10\textsuperscript{th}, 25\textsuperscript{th}, 50\textsuperscript{th}, 75\textsuperscript{th}, and 90\textsuperscript{th} percentiles of feedback orientation in the sample (Table A.6). Consistent with previous findings, the indirect effect of the supervisor feedback environment through career insight was not conditional on feedback orientation, and was positive and significant at all levels of feedback orientation. The indirect effect through need for development was again dependent upon feedback orientation score, with no effect below the 50\textsuperscript{th} percentile and a negative effect for feedback orientation scores at and above the 50\textsuperscript{th} percentile.

Interestingly, the indirect path through feedback seeking was not significant at any level of feedback orientation. The index of moderated mediation confirmed these results: the index was negative and significant for need for development \((\text{index} = -0.90, \text{se} = 0.49, \text{C.I.} = -2.16 \text{ to } -0.14)\). Taken together, only the indirect path through need for development was conditional upon feedback orientation when modeled as an \(a\)-path moderator. The indirect effect of supervisor feedback seeking on self-development through career insight was unconditionally positive, while the indirect effect through feedback seeking was not statistically different from zero.
Table A.5. Path analytic results from analyses of the conditional indirect effect of supervisor feedback environment on self-development through 3 parallel mediators with feedback orientation as an $\alpha$ path moderator.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>M1 (Career Insight)</th>
<th>M2 (Need for Development)</th>
<th>M3 (Feedback Seeking)</th>
<th>T (Self-Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff</td>
<td>SE</td>
<td>$p$</td>
<td>Coeff</td>
</tr>
<tr>
<td>$X$ (SFE)</td>
<td>$a_{11}$</td>
<td>0.28</td>
<td>0.05</td>
<td>$&lt; .001$</td>
</tr>
<tr>
<td>$M_1$ (CI)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>$M_2$ (NFD)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>$M_3$ (FS)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>$W$ (FO)</td>
<td>$a_{11}$</td>
<td>0.38</td>
<td>0.06</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>$XW$</td>
<td>$a_{12}$</td>
<td>-0.01</td>
<td>0.07</td>
<td>.86</td>
</tr>
<tr>
<td>Constant</td>
<td>$\beta_0$</td>
<td>4.14</td>
<td>0.03</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

$R^2 = .25$ $R^2 = .04$ $R^2 = .08$ $R^2 = .17$

$F(3, 418) = 46.60$, $p < .001$ $F(3, 418) = 6.15$, $p < .001$ $F(3, 418) = 11.95$, $p < .001$ $F(4, 417) = 20.90$, $p < .001$

Note. $X =$ independent variable; $M_i =$ mediator variable; $W =$ moderator variable; $XW =$ interaction term; $Y =$ dependent variable; SFE = supervisor feedback environment; CI = career insight; NFD = need for development; FS = feedback seeking; FO = feedback orientation. Reported coefficients are unstandardized.
Table A.6. Conditional indirect effects of the supervisor feedback environment on self-development through three mediators when the $a$ path is moderated by feedback orientation.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Feedback Orientation (W)</th>
<th>$\omega$</th>
<th>$se_\omega$</th>
<th>C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Insight ($M_1$)</td>
<td>-0.61 (10th %ile)</td>
<td>2.18</td>
<td>0.75</td>
<td>0.94 - 3.91</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>2.16</td>
<td>0.68</td>
<td>1.04 - 3.73</td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>2.12</td>
<td>0.65</td>
<td>1.05 - 3.60</td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>2.10</td>
<td>0.66</td>
<td>1.02 - 3.63</td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>2.06</td>
<td>0.75</td>
<td>0.85 - 3.83</td>
</tr>
<tr>
<td>Need for Development ($M_2$)</td>
<td>-0.61 (10th %ile)</td>
<td>0.08</td>
<td>0.34</td>
<td>-0.60 - 0.84</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>-0.19</td>
<td>0.32</td>
<td>-1.03 - 0.27</td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>-0.51</td>
<td>0.36</td>
<td>-1.49 - 0.03</td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>-0.69</td>
<td>0.41</td>
<td>-1.80 - 0.11</td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>-1.09</td>
<td>0.58</td>
<td>-2.62 - 0.24</td>
</tr>
<tr>
<td>Feedback Seeking ($M_3$)</td>
<td>-0.61 (10th %ile)</td>
<td>-0.79</td>
<td>0.58</td>
<td>-2.09 - 0.17</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>-0.48</td>
<td>0.47</td>
<td>-1.51 - 0.36</td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>-0.11</td>
<td>0.45</td>
<td>-1.04 - 0.80</td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>0.10</td>
<td>0.51</td>
<td>-0.88 - 1.15</td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>0.57</td>
<td>0.73</td>
<td>-0.73 - 2.17</td>
</tr>
</tbody>
</table>

Note. Values of feedback orientation are centered and presented at the 10th, 25th, 50th, 75th and 90th percentiles of the distribution of feedback orientation in the sample. $M_i$ = mediator variable; $W$ = moderator variable; $\omega$ = size of the indirect effect; $se_\omega$ = the standard error of the effect; C.I. = 95% confidence interval.

A conditional indirect effects model including feedback seeking as a third mediator and feedback orientation as a $b$-path moderator was analyzed (Figure A.4). As the hypotheses tested as part of the present study did not include an explicit expectation that feedback seeking would be related to self-development, or that it would carry the indirect effect of supervisor feedback environment, no investigation of feedback orientation as a $b$-path moderator of this relationship has been examined to this point.
Results from the model estimation are summarized in Table A.7 and indirect effect estimates are reported in Table A.8.

As anticipated, the values for the $a$ paths duplicate previously reported findings for the supervisor feedback environment-mediator relationships: again, supervisor feedback seeking was unrelated to need for development, and positively related to both career insight and feedback seeking ($a_3 = .22, p = .02$). Of the mediators, career insight and feedback seeking were both positively related to self-development ($b_{11} = 5.18, p = .004$ and $b_{13} = 3.02, p < .001$), as was the moderator, feedback orientation ($b_2 = 13.97, p < .001$). The effect of need for development approached significance, but had no meaningful effect on self-development ($b_{12} = 1.51, p = .05$).

Consistent with the previously estimated model, career insight (as affected by supervisor feedback environment) again interacted with feedback orientation to predict self-development ($b_{31} = 6.06, p = .01$), and in a pattern consistent with Hypothesis 11. No interactive effect existed for need for development ($b_{32} = -.076, p = .50$) nor for feedback seeking ($b_{33} = .92, p = .54$) as predictors of self-development. Again, the supervisor feedback environment had no direct effect on self-development in this model ($c' = -0.46, p = .80$), indicating that any effect of the supervisor feedback environment occurred through the mediators.
Figure A.4. Statistical depiction of model for b-path moderation of the supervisor feedback environment-self-development relationship with 3 mediators.
Table A.7. Path analytic results corresponding to Figure A.4 exploring the conditional indirect effects of the supervisor feedback environment on self-development through three mediators, when feedback orientation moderates the b-path.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>M1 (Career Insight)</th>
<th>M2 (Need for Development)</th>
<th>M3 (Feedback Seeking)</th>
<th>Y (Self-Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff</td>
<td>SE</td>
<td>p</td>
<td>Coeff</td>
</tr>
<tr>
<td>X (SFE)</td>
<td>0.44</td>
<td>0.05</td>
<td>&lt;.001</td>
<td>-0.22</td>
</tr>
<tr>
<td>M1 (CI)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2 (NFD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3 (FS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V (FO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1 × V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2 × V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3 × V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-1.72</td>
<td>0.18</td>
<td>&lt;.001</td>
<td>0.09</td>
</tr>
</tbody>
</table>

$R^2 = .18$  
$F(1, 420) = 91.55, p < .001$

$R^2 = .00$  
$F(1, 420) = 05, p < .83$

$R^2 = .013$  
$F(1, 420) = 5.38, p = .02$

$R^2 = .25$  
$F(1, 420) = 17.11, p < .001$

Note. X = independent variable; M1 = mediator variable; V = moderator variable; M1 × V = interaction term; Y = dependent variable; SFE = supervisor feedback environment; CI = career insight; NFD = need for development; FS = feedback seeking; FO = feedback orientation. Reported coefficients are unstandardized.

To evaluate this proposition, the conditional indirect effects through the three mediators were estimated at the 10th, 25th, 50th, 75th, and 90th percentiles of feedback orientation in the sample, and Bootstrapped confidence intervals were calculated to determine whether or not the estimated effect was nonzero. Estimates are presented in Table A.8. The indirect effect patterns were consistent with previous findings for both career insight and need for development: the indirect effect through career insight was conditional upon feedback orientation, while the indirect effect through need for development was not significantly different from zero at any level of feedback orientation. Career insight’s effect was positive and significant at and above the 50th percentile of feedback orientation (a score of 3.85), and not significantly different from zero below the 50th percentile. The indirect effect through feedback seeking was positive and significantly different from zero, regardless of feedback orientation’s effect on the b
path (Table A.7), quite unlike findings for the indirect effect through feedback seeking with feedback orientation as an $\alpha$-path moderator (Table A.5, A.6). Although the indirect effect was not conditional on feedback orientation, the absence of feedback orientation’s effect on feedback seeking, modeled in Figure A.4, restored the pattern of the indirect effect to be more consistent with that observed in Table A.1.

Table A.8. Indirect effect estimates corresponding to Figure A.4.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Feedback Orientation (V)</th>
<th>$\omega$</th>
<th>$se_\omega$</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Insight ($M_1$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.61 (10$^{th}$ %ile)</td>
<td>0.64</td>
<td>1.01</td>
<td>-1.36</td>
</tr>
<tr>
<td></td>
<td>-0.31 (25$^{th}$ %ile)</td>
<td>1.43</td>
<td>0.83</td>
<td>-0.15</td>
</tr>
<tr>
<td></td>
<td>0.04 (50$^{th}$ %ile)</td>
<td>2.35</td>
<td>0.82</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>0.24 (75$^{th}$ %ile)</td>
<td>2.88</td>
<td>0.93</td>
<td>1.18</td>
</tr>
<tr>
<td></td>
<td>0.69 (90$^{th}$ %ile)</td>
<td>4.07</td>
<td>1.34</td>
<td>1.67</td>
</tr>
</tbody>
</table>

| Need for Development ($M_2$)          |                          |         |             |             |
|                                       | -0.61 (10$^{th}$ %ile)  | -0.04   | 0.25        | -0.72       |
|                                       | -0.31 (25$^{th}$ %ile)  | -0.04   | 0.22        | -0.59       |
|                                       | 0.04 (50$^{th}$ %ile)   | -0.03   | 0.19        | -0.51       |
|                                       | 0.24 (75$^{th}$ %ile)   | -0.03   | 0.18        | -0.51       |
|                                       | 0.69 (90$^{th}$ %ile)   | -0.02   | 0.18        | -0.60       |

| Feedback Seeking ($M_3$)              |                          |         |             |             |
|                                       | -0.61 (10$^{th}$ %ile)  | 0.55    | 0.40        | 0.00        |
|                                       | -0.31 (25$^{th}$ %ile)  | 0.61    | 0.36        | 0.10        |
|                                       | 0.04 (50$^{th}$ %ile)   | 0.69    | 0.36        | 0.13        |
|                                       | 0.24 (75$^{th}$ %ile)   | 0.73    | 0.38        | 0.13        |
|                                       | 0.69 (90$^{th}$ %ile)   | 0.82    | 0.48        | 0.11        |

Note: Values of feedback orientation are centered and presented at the 10$^{th}$, 25$^{th}$, 50$^{th}$, 75$^{th}$ and 90$^{th}$ percentiles of the distribution of feedback orientation in the sample. $M_i$ = mediator variable; $V$ = moderator variable $\omega = \text{size of the indirect effect}$, $se_\omega = \text{the standard error of the effect}$. C.I. = 95% confidence interval.

The index of moderated mediation confirmed that the indirect effect through career insight was the only statistically nonzero effect (index = 2.64, C.I. = .33 to 5.52), as
confidence intervals for the index calculated for need for development (index = .02, CI = -0.22 to .55) and feedback seeking (index = .21, CI = -0.37 to 1.27) both included zero. Although there was no indirect effect of supervisor feedback environment on self-development through need for development as modeled, and the indirect effect through feedback seeking was not conditional, the indirect effect through career insight was conditional upon the level of feedback orientation as modeled on the b path.

As with the previous approaches to moderation, a second model was estimated repeating the previous analysis and including feedback seeking as the third moderator (Figure A.5). Results from this analysis are presented in Table A.9. First, supervisor feedback environment was related to career insight and need for development as before, but was unrelated to feedback seeking ($a_{13} = -0.03, p = .75$). Feedback orientation was positively and significantly related to all three mediators; however, the interactive effect of supervisor feedback environment and feedback orientation was only significant for need for development ($a_{32} = -0.43, p = .006$) consistent with previous findings.
Figure A.5. Statistical depiction of Hayes (2013) Model 58 with 3 mediators and both $a$ and $b$ paths moderated by feedback orientation.
Table A.9. Path analytic results for the conditional indirect effects of supervisor feedback environment on self-development, through career insight, need for development, and feedback seeking with feedback orientation as a moderator of both $a$ and $b$ paths.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>Consequent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M_1$ (Career Insight)</td>
</tr>
<tr>
<td></td>
<td>Coeff</td>
</tr>
<tr>
<td>$X$ (SFE)</td>
<td>$a_{11}$</td>
</tr>
<tr>
<td>$M_1$ (CI)</td>
<td>---</td>
</tr>
<tr>
<td>$M_2$ (NFD)</td>
<td>---</td>
</tr>
<tr>
<td>$M_3$ (FS)</td>
<td>---</td>
</tr>
<tr>
<td>$X \times W$</td>
<td>$a_{21}$</td>
</tr>
<tr>
<td>$M_1 \times W$</td>
<td>---</td>
</tr>
<tr>
<td>$M_2 \times W$</td>
<td>---</td>
</tr>
<tr>
<td>$M_3 \times W$</td>
<td>---</td>
</tr>
<tr>
<td>Constant</td>
<td>$i_{11}$</td>
</tr>
</tbody>
</table>

$R^2 = .25$ | $R^2 = .04$ | $R^2 = .08$ | $R^2 = .25$
$F(3, 418) = 46.60$, $p < .001$ | $F(3, 418) = 6.15$, $p < .001$ | $F(3, 418) = 11.95$, $p < .001$ | $F(8, 413) = 17.11$, $p < .001$

Note: $X$ = independent variable; $M_i$ = mediator variable; $W$ = moderator variable; $X \times W$ = a path interaction term; $M_i \times W$ = a path interaction term; $Y$ = dependent variable; SFE = supervisor feedback environment; CI = career insight; NFD = need for development; FS = feedback seeking; FO = feedback orientation. Reported coefficients are unstandardized.
Several paths relating to self-development were significant and consistent with the previously estimated dual-path moderation model: career insight and feedback orientation were positively and significantly related to self-development ($b_{11} = 5.18, p = .004$ and $b_{2} = 13.87, p < .001$, respectively). Interestingly, need for development was not significantly related once feedback seeking was added into the prediction equation, consistent with findings for model 14.2. Feedback seeking was positively and significantly related to self-development ($b_{13} = 3.02, p < .001$). With regard to the interactive effects of feedback orientation, only career insight interacted with feedback orientation to predict self-development ($b_{31} = 6.06, p = .01$). Again, the supervisor feedback environment was not directly related to self-development after taking into account all of the predictors and interactions ($c’ = -0.46, p = .80$). To summarize, it appears that feedback orientation moderates the $a$ path of the indirect effect of supervisor feedback environment through self-development, and the $b$ path of the indirect effect of the supervisor feedback environment through career insight, but has no moderating effect on either path for feedback seeking.

Again, estimates for the indirect effects were calculated at the 10th, 25th, 50th, 75th and 90th percentiles of feedback orientation in order to address the conditionality of the three indirect effects (Table A.10). Consistent with the two mediator model reported previously, the indirect effect through career insight was conditional on feedback orientation as a moderator of both paths: the effect was positive and significant at and above levels of feedback orientation corresponding to the 50th percentile of the sample, but no different from zero at levels below this point. The indirect effect through need for development simply did not differ significantly from zero at any level of feedback orientation.
orientation. The addition of feedback seeking did nothing to change these results, and the
indirect path through feedback seeking itself did not have a significantly non-zero effect
at any level of feedback orientation. In sum, only the effect through career insight was
meaningful, and it was conditional upon feedback orientation such that the indirect effect
of supervisor feedback environment on self-development through career insight only
existed at or above the 50th percentile of feedback orientation in the sample.

Table A.10. The conditionality of the indirect effect of supervisor feedback environment
on self-development through three mediators, when both a and b paths are moderated by
feedback orientation.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Feedback Orientation (W)</th>
<th>ω</th>
<th>se_ω</th>
<th>C.I.</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Insight (M₁)</td>
<td>-0.61 (10th %ile)</td>
<td>0.42</td>
<td>0.69</td>
<td>-0.81, 1.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>0.93</td>
<td>0.58</td>
<td>-0.06, 2.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>1.51</td>
<td>0.57</td>
<td>0.57, 2.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>1.84</td>
<td>0.64</td>
<td>0.78, 3.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>2.54</td>
<td>1.05</td>
<td>0.94, 5.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need for Development (M₂)</td>
<td>-0.61 (10th %ile)</td>
<td>0.07</td>
<td>0.35</td>
<td>-0.51, 1.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>-0.16</td>
<td>0.26</td>
<td>-0.93, 0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>-0.36</td>
<td>0.29</td>
<td>-1.21, 0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>-0.44</td>
<td>0.35</td>
<td>-1.47, 0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>-0.51</td>
<td>0.67</td>
<td>-2.22, 0.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback Seeking (M₃)</td>
<td>-0.61 (10th %ile)</td>
<td>-0.45</td>
<td>0.43</td>
<td>-1.76, 0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.31 (25th %ile)</td>
<td>-0.30</td>
<td>0.32</td>
<td>-1.17, 0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.04 (50th %ile)</td>
<td>-0.08</td>
<td>0.33</td>
<td>-0.76, 0.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.24 (75th %ile)</td>
<td>0.07</td>
<td>0.39</td>
<td>-0.65, 0.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.69 (90th %ile)</td>
<td>0.48</td>
<td>0.65</td>
<td>-0.56, 2.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Values of feedback orientation are centered and presented at the 10th, 25th, 50th, 75th and
90th percentiles of the distribution of feedback orientation in the sample. Mᵢ = mediator variable;
W = moderator variable; ω = size of the indirect effect; se_ω = the standard error of the effect; C.I. =
95% confidence interval.
Follow Up Analyses

After finding an unexpected negative relationship between the supervisor feedback environment and need for development for individuals with higher feedback orientation scores, follow up analyses were conducted to explore characteristics of these individuals that could potentially explain the observed negative relationship. In particular, demographic characteristics and dimension scores on the Feedback Environment scale were compared between the two groups (i.e., no observed relationship, negative observed relationship).

First, a new variable was created that split the sample into the two relationship status groups using the Johnson-Neyman point of transition identified analyses presented for Hypothesis 10 in Chapter IV (Figure 4.7). The Johnson-Neyman technique reveals the specific point of a moderator variable (i.e., feedback orientation) where the relationship between predictor and outcome (i.e., supervisor feedback environment and need for development) transitions from zero to nonzero. In essence, that point on the moderator, a score of about 3.79 on feedback orientation, designates a breaking point between the no relationship group and the negative relationship group, and thus was used to split the sample. The resulting variable was a dichotomous indication of whether or not an individual’s feedback orientation score corresponded to no relationship between the supervisor feedback environment and need for development (i.e., feedback orientation value less than the J-N transition point, coded as 0) or to a negative relationship between the supervisor feedback environment and need for development (i.e., feedback orientation greater than the J-N transition point, coded as 1). For simplicity, these two groups will be referenced as the no relationship group and the negative relationship group.
Second, the supervisor feedback environment dimension scores were examined to see if there were mean differences between the no relationship and negative relationship groups using an independent samples t-test. Results are presented in Table A.11. The Levene’s test for equality of variance was significant for three supervisor feedback environment dimensions, indicating the two groups did not have equal variance on the constructs included in the analysis; therefore, the statistics reported for some feedback environment dimensions have been adjusted using the Welch-Satterthwaite approximation, and are noted in Table A.11. Across all dimensions of the supervisor feedback environment, results show that those with a negative relationship between the feedback environment and need for development had higher scores on average than did individuals with no relationship between the supervisor feedback environment and need for development.

Table A.11. Results of t-test and Descriptive Statistics for Feedback Environment Scale Dimensions by Supervisor Feedback Environment- Need for Development Relationship Status

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Relationship Status</th>
<th>95% CI for Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Relationship</td>
<td>Negative Relationship</td>
</tr>
<tr>
<td></td>
<td>(n = 176)</td>
<td>(n = 246)</td>
</tr>
<tr>
<td>Source Credibility</td>
<td>3.93 0.72</td>
<td>4.34 0.62</td>
</tr>
<tr>
<td>Feedback Quality</td>
<td>3.63 0.83</td>
<td>4.24 0.72</td>
</tr>
<tr>
<td>Feedback Delivery</td>
<td>3.75 0.81</td>
<td>4.11 0.76</td>
</tr>
<tr>
<td>Favorable Feedback</td>
<td>3.50 0.96</td>
<td>4.11 0.82</td>
</tr>
<tr>
<td>Unfavorable Feedback</td>
<td>3.50 0.71</td>
<td>3.89 0.69</td>
</tr>
<tr>
<td>Availability</td>
<td>3.64 0.78</td>
<td>4.06 0.67</td>
</tr>
<tr>
<td>Promotes Feedback Seeking</td>
<td>3.58 0.72</td>
<td>4.07 0.73</td>
</tr>
</tbody>
</table>

Note: CI = Confidence Interval. M = Mean. SD = Standard Deviation. *denotes analyses that employed the Welch-Satterthwaite approximation due to unequal group variances. * p < .05 (2-tailed).
Third, the demographic characteristics of the two groups were compared to determine if there are any job-related demographic characteristics that could account for the differences. A series of independent sample t-tests were conducted comparing the low and high feedback orientation groups on age, hours worked per week, tenure with the organization, and tenure with supervisor. Results are presented in Table A.12. The Levene’s test for equality of variance was significant for three characteristics, indicating the two groups did not have equal variance on the constructs included in the analysis; therefore, the statistics reported for some feedback environment dimensions have been adjusted using the Welch-Satterthwaite approximation, and are noted in Table A.12. Significant mean differences between the two groups existed for age, tenure with the organization, and tenure with supervisor. Employees in the high feedback orientation group associated with a negative relationship between the supervisor feedback environment and need for development were younger, less tenured, and less tenured with their current supervisor. The two groups did not differ in the average hours worked per week.

Results from these analyses indicate that there are characteristic differences (i.e., age, tenure, dimensions of the feedback environment) between low and high feedback orientation groups. These demographic characteristics were controlled for in hypothesis testing analyses and found to produce results that were not substantially different, and thus omitted at the recommendation of Becker (2005). Despite this decision, there do appear to be differences between individuals that self-reported stronger vs. weaker feedback orientation scores.
Table A.12. Results of t-test and Descriptive Statistics for Demographic Characteristics by Supervisor Feedback Environment-Need for Development Relationship Status

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Relationship Group</th>
<th>95% CI for Mean Difference</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Relationship (n = 176)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>M = 38.89, SD = 11.84</td>
<td>M = 36.44, SD = 10.58</td>
<td>0.25, 4.65</td>
<td>2.19*</td>
</tr>
<tr>
<td>Hours per week</td>
<td>M = 40.76, SD = 7.01</td>
<td>M = 41.04, SD = 7.45</td>
<td>-1.69, 1.13</td>
<td>-0.39</td>
</tr>
<tr>
<td>Organizational Tenurea</td>
<td>M = 7.45, SD = 5.30</td>
<td>M = 6.20, SD = 4.66</td>
<td>0.27, 2.23</td>
<td>2.51*</td>
</tr>
<tr>
<td>Tenure with Supervisora</td>
<td>M = 5.28, SD = 3.72</td>
<td>M = 4.30, SD = 2.55</td>
<td>0.34, 1.62</td>
<td>3.01*</td>
</tr>
</tbody>
</table>

Note: CI = Confidence Interval. M = Mean. SD = Standard Deviation. *denotes analyses that employed the Welch-Satterthwaite approximation due to unequal group variances. * p < .05 (2-tailed).
APPENDIX B

MEASURES

FEEDBACK ENVIRONMENT - REVISED Supervisor scale

Instructions: Considering your professional relationship with your current supervisor (this includes the whole time that you have worked for him or her) please rate the extent to which you agree or disagree with each of the following statements.

1. My supervisor has generally been familiar with my performance on the job.
2. In general, I have respected my supervisor’s opinions about my job performance.
3. With respect to job performance feedback, I usually have not trusted my supervisor.
4. My supervisor has been fair when evaluating my job performance.
5. I have had confidence in the feedback my supervisor gives me.
6. My supervisor has given me useful feedback about my job performance.
7. The performance feedback I have received from my supervisor is helpful.
8. I have valued the feedback I have received from my supervisor.
9. The feedback I have received from my supervisor has helped me do my job.
10. The performance information I have received from my supervisor has generally not been very meaningful.
11. My supervisor has been supportive when giving me feedback about my job performance.
12. When my supervisor has given me performance feedback, he or she has been considerate of my feelings.
13. My supervisor has generally provided feedback in a thoughtless manner.
14. My supervisor has not treated people very well when providing performance feedback.
15. My supervisor has been tactful when giving me performance feedback.
16. When I have done a good job at work, my supervisor has praised my performance.
17. I seldom have received praise from my supervisor.
18. My supervisor has generally let me know when I have done a good job at work.
19. I have frequently received positive feedback from my supervisor.
20. When I have not met deadlines, my supervisor has let me know.
21. My supervisor has told me when my work performance has not meet organizational standards.
22. On those occasions when my job performance has fallen below what was expected, my supervisor has let me know.
23. On those occasions when I have made a mistake at work, my supervisor has told me.
24. My supervisor has usually been available when I have wanted performance information.
25. My supervisor has been too busy to give me feedback. (R)
26. I have had little contact with my supervisor. (R)
27. I have interacted with my supervisor on a daily basis
28. The only time I have received performance feedback from my supervisor is during my performance review. (R)
29. My supervisor has often been annoyed when I have directly asked for performance feedback. (R)
30. When I have asked for performance feedback, my supervisor generally has not given me the information right away. (R)
31. I have felt comfortable asking my supervisor for feedback about my work performance.
32. My supervisor has encouraged me to ask for feedback whenever I am uncertain about my job performance.

**Response Scale:**

1 = Strongly Disagree
2 = Disagree
3 = Neither Agree nor Disagree
4 = Agree

5 = Strongly Agree
Feedback Orientation  
Linderbaum and Levy (2010)

Instructions: Please rate the extent to which you agree or disagree with each of the following statements. Remember that there are no right answers, just your honest thoughts and feelings.

1. Feedback contributes to my success at work.
2. To develop my skills at work, I rely on feedback.
3. Feedback is critical for improving performance.
4. Feedback from supervisors can help me advance in a company.
5. I find that feedback is critical for reaching my goals.
6. It is my responsibility to apply feedback to improve my performance
7. I hold myself accountable to respond to feedback appropriately.
8. I don’t feel a sense of closure until I respond to feedback.
9. If my supervisor gives me feedback, it is my responsibility to respond to it.
10. I feel obligated to make changes based on feedback.
11. I try to be aware of what other people think of me.
12. Using feedback, I am more aware of what people think of me.
13. Feedback helps me manage the impression I make on others.
14. Feedback lets me know how I am perceived by others.
15. I rely on feedback to help me make a good impression.
16. I feel self-assured when dealing with feedback.
17. Compared to others, I am more competent at handling feedback.
18. I believe that I have the ability to deal with feedback effectively.
19. I feel confident when responding to both positive a negative feedback.
20. I know that I can handle the feedback that I receive.

Response Scale:
1 = Strongly Disagree
2 = Disagree
3 = Neither Agree nor Disagree
4 = Agree
5 = Strongly Agree
Career Motivation Scale  
(London, 1993)

Please rate the extent to which you (your subordinate):

**Insight**

1. Have clear career goals  
2. Have realistic career goals  
3. Know your strengths (the things you do well)  
4. Know your weaknesses (the things you are not good at)  
5. Recognize what you can do well and cannot do well  
6. See yourself as a professional and/or technical expert

1 = low, 3 = moderate, 5 = high

Perceived Need for Development  
(Maurer et al., 2003)

1. One or more of my career related skills or knowledge have been in need of improvement.  
2. I have seriously thought that my job abilities should be increased in certain areas.  
3. I have been in real need of career related skill or knowledge improvement.

1 = Disagree Very Strongly  
2 = Disagree Strongly  
3 = Disagree  
4 = Neutral  
5 = Agree  
6 = Agree Strongly  
7 = Agree Very Strongly
Protean Career Attitudes Scale
(Briscoe & Hall, 2005; Briscoe et al., 2006)

1. When development opportunities have not been offered by my company, I’ve sought them out on my own.
2. I am responsible for my success or failure in my career.
3. Overall, I have a very independent, self-directed career.
4. Freedom to choose my own career path is one of my most important values.
5. I am in charge of my own career.
6. Ultimately, I depend upon myself to move my career forward.
7. Where my career is concerned, I am very much “my own person.”
8. In the past I have relied more on myself than others to find a new job when necessary.
9. I navigate my own career, based on my personal priorities, as opposed to my employer’s priorities.
10. It doesn’t matter much to me how other people evaluate the choices I make in my career.
11. What’s most important to me is how I feel about my career success, not how other people feel about it.
12. I’ll follow my own conscience if my company asks me to do something that goes against my values.
13. What I think about what is right in my career is more important to me than what my company thinks.
14. In the past I have sided with my own values when the company has asked me to do something I don’t agree with.


Rating Scale:
1 = Strongly Disagree
2 = Disagree
3 = Somewhat Disagree
4 = Neither Agree nor Disagree
5 = Somewhat Agree
6 = Agree
7 = Strongly Agree
Developmental Checklist
Orvis & Leffler (2011)

Think about the last twelve months. Indicate the frequency with which you have participated in the following activities. Remember, you are only reporting the activities that were not required for your job.

To learn something new for your job, or to improve your job-related knowledge and skills, how many times have you:

1. Used pre-recorded audio/video programs or webcasts that were optional (not required for my job)
2. Taken an optional college, continuing education, or professional certification course.
3. Attended an optional job-related training class, workshop, seminar, or conference.
4. Read a book/trade journal that was voluntary reading.
5. Consulted with a career counselor.
6. Voluntarily worked on or practiced a specific skills “on the job.”
7. Voluntarily worked to learn a new skill on the job.
8. Tried to improve a specific attribute of myself while I was doing the work required of my job.
9. Asked for feedback and input from coworkers.
10. Asked for feedback and input from a supervisor at work.
11. Asked for feedback and input from subordinates at work.
12. Voluntarily participated in a special project, task, or committee assignment.
13. Requested coaching from a supervisor at work.
14. Voluntarily taken a different job assignment on a temporary basis.
15. Created or worked on a career/professional development plan.
16. Participated in a voluntary assessment at work which provided formal feedback on my strengths, weaknesses, or style.
17. Relied on a special or close relationship of some kind to get job/career-related advice or suggestions.
18. Acted as a job/career-related coach, mentor, or teacher to someone else.
19. Attended an organized event which focused on future job/career issues.

Response Scale:
0 = Never
1 = One Time
2 = Two times
3 = Three times
4 = Four times
5 = Five times
6 = Six or more times
Feedback Seeking
Williams & Johnson (2000) (as used by Whitaker dissertation)

Employee:

1. How often do you ask your supervisor for information about what is required of you to function successfully on the job?
2. How often do you ask your co-workers for information about what is required of you to function successfully on the job?
3. How often do you ask your supervisor how well you are performing on the job?
4. How often do you ask your co-workers how well you are performing on the job?

Response Scale:
0 = Never
1 = Less than Once a Month
2 = Once a Month
3 = 2-3 Times a Month
4 = Once a Week
5 = 2-3 Times a Week
6 = Daily

Participation in Formal Development
Kraimer, Seibert, Wayne, Liden, & Bravo (2010)

On a scale of 1 (not at all) to 5 (a very large extent), indicate the extent to which your employee has participated in the following career development activities. Compare your employee to other colleagues in your company.

a) Workshops/computer-based training classes to develop technical skills
b) workshops/computer-based training classes to develop managerial skills
c) career planning workshops
d) educational courses that qualified for tuition reimbursement
e) job rotations into different divisions of the company
f) job rotations into different functional areas within the company
Perceived Organizational Support Short Form

(Eisenberger et al., 1986)

Original wording: Listed below and on the next several pages are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your own feelings about the particular organization for which you are now working, please indicate the degree of your agreement or disagreement with each statement by checking one of the seven alternatives below each statement.

Modification for online use: Listed below pages are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your own feelings about the particular organization for which you are now working, please indicate the degree of your agreement or disagreement with each statement using the scale provided.

Response Scale:
1 = Strongly Disagree
2 = Disagree
3 = Neither Agree nor Disagree
4 = Agree
5 = Strongly Agree

1. The organization values my contribution to its well-being.
2. If the organization could hire someone to replace me at a lower salary it would do so. R
3. The organization fails to appreciate any extra effort from me. R
4. The organization strongly considers my goals and values. R
5. The organization would ignore any complaint from me. R
6. The organization disregards my best interests when it makes decisions that affect me. R
7. Help is available from the organization when I have a problem.
8. The organization really cares about my well-being.
9. The organization is willing to extend itself in order to help me perform my job to the best of my ability.
10. Even if I did the best job possible, the organization would fail to notice. R
11. The organization is willing to help me when I need a special favor.
12. The organization cares about my general satisfaction at work.
13. If given the opportunity, the organization would take advantage of me. R
14. The organization shows very little concern for me. R
15. The organization cares about my opinions.
16. The organization takes pride in my accomplishments at work.
17. The organization tries to make my job as interesting as possible.
Organizational Support for Development

Maurer et al. (2003) and Orvis & Leffler (2011)

All items were accompanied by this response scale:

1 = Disagree Very Strongly
2 = Disagree Strongly
3 = Disagree
4 = Neutral
5 = Agree
6 = Agree Strongly
7 = Agree Very Strongly

Coworkers

My coworkers believe that learning and training activities are important.

My peers/coworkers are supportive of learning activities.

The people I work with participate in training and learning activities.

My peers at work are supportive of my efforts to improve and develop my career relevant skills.

My subordinates at work are supportive of my efforts to improve my career skills.

People I work with are supportive of my efforts to improve my career skills.

“Customers or Clients” are supportive of my efforts to improve my career skills.

My coworkers encourage me to believe that I can learn and improve at work.

People at work have persuaded me to think that I am capable of improving and developing my work skills.
Supervisor

My supervisor is supportive of my efforts to improve my work skills.

My supervisor helps me to develop career plans.

My supervisor provides me with a useful performance appraisal.

My supervisor provides me with ongoing feedback.

My supervisor provides adequate time for me to attend training.

My supervisor’s behavior facilitates my participation in learning activities.

My supervisor encourages me to participate in activities which promote skill improvement.

My supervisor does not support my participation in learning activities.

My supervisor has tried to make me believe that I am capable of learning and improving at work.

My supervisor has been a “cheerleader” when it comes to my learning and improving at work.

In his/her own way, my boss tells me that I am able to increase my career skills and learn new things.
**Resources/policies**

There are learning and skill development resources available to me through my employer that can help me improve my career skills.

Skill development options or learning materials can be obtained by me that will assist in improving my job/career skills.

There are no effective development options or resources available that can help me improve my career skills.

The policies and work rules where I am employed make it possible to participate in career related learning and development activities.

Regulations, reward policies and time constraints where I work make it difficult to participate in career-related learning and development activities.

Our company places much value on employee learning and development activities.

My employer emphasizes employee learning to its employees.

My employer does not have an employee learning orientation.

For Maurer et al. (2003), the latter three scales were highly intercorrelated (r values between .56 and .63) and conceptually similar, in that they were all dimensions of work support, so they were combined into a linear composite by taking a mean. Thus, two scales were created: non-work support (8 items) and work support (29 items).
APPENDIX C

HUMAN SUBJECTS APPROVAL

June 12, 2015

Caitlin Cavanaugh
1318 Westervane Lane, 2C
Akron, Ohio 44313

From: Sharon McWhorter, IRB Administrator
Re: IRB Number 20150603 "Feedback and Employee Development"

Thank you for submitting your Exemption Request for the referenced study. Your request was approved on June 12, 2015. The protocol represents minimal risk to subjects and matches the following federal category for exemption:

☐ Exemption 1 - Research conducted in established or commonly accepted educational settings, involving normal educational practices.
☐ Exemption 2 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior.
☐ Exemption 3 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior not exempt under category 2, but subjects are elected or appointed public officials or candidates for public office.
☐ Exemption 4 - Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens.
☐ Exemption 5 - Research and demonstration projects conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine public programs or benefits.
☐ Exemption 6 - Taste and food quality evaluation and consumer acceptance studies.

Annual continuation applications are not required for exempt projects. If you make changes to the study's design or procedures that increase the risk to subjects or include activities that do not fall within the approved exemption category, please contact me to discuss whether or not a new application must be submitted. Any such changes or modifications must be reviewed and approved by the IRB prior to implementation.

Please retain this letter for your files. This office will hold your exemption application for a period of three years from the approval date. If you wish to continue this protocol beyond this period, you will need to submit another Exemption Request. If the research is being conducted for a master's thesis or doctoral dissertation, the student must file a copy of this letter with the thesis or dissertation.

☑ Approved consent form/s enclosed

Cc: Paul Levy - Advisor
Cc: Valerie Callanan - IRB Chair