What Should Developmental Assessment Centers be Developing?

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This article raises an important and seldom discussed question for those who design and implement developmental assessment centers (DACs): Are the dimensions traditionally assessed in managerial assessment centers also the most appropriate for DACs? Dimensions in DACs are often borrowed directly from traditional assessment centers, with little consideration of whether, to what extent, or how development can be expected to take place. In this article, we explain the necessity of considering development, and we discuss the importance of both objective and perceived de-
velopability. We further discuss the concept of a continuum of developability and offer recommendations for DAC researchers and for practitioners seeking to determine the appropriateness of dimensions for DAC programs.

Assessment centers have a long, rich, and successful history. Hundreds of thousands of employees have been assessed using this method, and hundreds of research studies have been conducted on the use of assessment centers (Howard, 1997). Indeed, it is generally accepted that assessment centers have adequate criterion-related validity (Gaugler, Rosenthal, Thornton, & Bentson, 1987; Hunter & Hunter, 1984; Schmidt & Hunter, 1998) and incremental validity above that of cognitive ability tests, supervisor ratings (Chan, 1996), and personality tests (Goffin, Rothstein, & Johnston, 1996). The majority of this research has been conducted on traditional assessment centers (ACs), which are used for the purpose of making selection, placement, or promotion decisions and diagnosing training needs (Kudisch et al., 2001; Spychalski, Quiñones, Gaugler, & Pohley, 1997).

A more recent application of the AC method that is gaining popularity in practice (Kudisch et al., 2001) is to use ACs as a tool for fostering employees’ professional development. ACs used for this purpose are referred to as developmental assessment centers (DACs) in that they serve the dual purpose of assessment and development (Iles & Forster, 1994; Joiner, 2002; Kudisch, Ladd, & Dobbins, 1997). Survey research indicates that upward of 40% of the operational ACs in practice today are of a developmental nature (Ballantyne & Povah, 2004; Constable, 1999; Spychalski et al., 1997), and many more human resource professionals are considering implementing such programs (U.K. Industrial Society, 1996).

Despite their popularity, a paucity of research exists on the effectiveness of DACs. The popularity of the method appears to rest almost entirely on the reputation of traditional ACs, which are different from DACs in many fundamental ways (see Table 1). Therefore, some authors have questioned whether researchers can generalize their knowledge about ACs to the DAC method, and they have called for research exploring the effectiveness of DACs across a variety of organizations, industries, and cultures (Carrick & Williams, 1999; Thornton & Rupp, 2005). They note that, for the most part, the design principles and best practices established for traditional ACs (e.g., Arthur, Woehr, & Maldegen, 2000; International Task Force on Assessment Center Guidelines, 2000) have not been empirically shown to be appropriate for DACs but, rather, have been generally assumed to be so. Given the differences between the methods, researchers and practitioners who develop DACs must consider whether following the traditional AC model is the most effective way to produce the intended development.

One significant assumption that has broad implications for all aspects of DAC development is that the constructs that have traditionally been assessed in selection ACs are also those that can be most effectively assessed and developed in a DAC context (Thornton & Rupp, 2005). These constructs, often referred to in the AC
field as behavioral dimensions, are generally chosen for their relevance to the target job (based on job analysis; International Task Force on Assessment Center Guidelines, 2000). Some research has investigated the degree to which different dimensions are predictive of subsequent job performance (e.g., Arthur, Day, McNelly, & Edens, 2003). For selection purposes, these are logical criteria. For developmental purposes, however, there are other factors to consider. Our purpose in the present article is not to argue that the criterion of job relevance is inappropriate for DACs but, rather, to argue that it is insufficient. Dimensions for DACs should be based on dimensions that can be expected to provide a reasonable return on investment in terms of performance improvement. Theory suggests that not all dimensions are equally developable (e.g., Brush & Licata, 1983; Waters, 1980) and not all training methods are equally effective for all skills (Arthur, Bennett, Edens, & Bell, 2003). Some highly relevant managerial competencies may not be well suited to development via a DAC. What is needed is an investigation of the dimensions most relevant for development and the dimensions most amenable to development using a DAC intervention.

### TABLE 1

Differences Between Traditional and Developmental Assessment Centers

<table>
<thead>
<tr>
<th></th>
<th>Traditional Assessment Center</th>
<th>Developmental Assessment Center</th>
</tr>
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<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>Assessment and development</td>
<td>Assessment and development Transfer of training</td>
</tr>
<tr>
<td><strong>Experience</strong></td>
<td>Diagnostic</td>
<td>Experiential learning, self-reflection, performance improvement</td>
</tr>
<tr>
<td><strong>Assessee’s role</strong></td>
<td>Assessee</td>
<td>Active learner</td>
</tr>
<tr>
<td><strong>Focus</strong></td>
<td>Overall performance</td>
<td>Dimension performance Improvement</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>Not always transparent</td>
<td>Extremely transparent Developable knowledge and skills</td>
</tr>
<tr>
<td><strong>Feedback</strong></td>
<td>Pass/fail, given upon completion</td>
<td>Extensive, given at multiple time points; detailed, behavior-based, high-quality action plans</td>
</tr>
<tr>
<td><strong>Predictive validity</strong></td>
<td>Overall rating or dimension ratings predict future success on the job</td>
<td>Dimension proficiency increases over time as a result of the developmental assessment center and subsequent developmental activities</td>
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</table>

If DACs are to be effective means of improving managerial performance, they must be designed in ways that make development most likely—that is, focusing on competencies that are important for success, amenable to change, and believed by the manager to be improvable. Though it is critical to examine the actual, or “objective,” developability of particular dimensions, it is also important to consider participants’ implicit theories about the developability of dimensions, because such theories have the potential to affect development itself (Dweck & Leggett, 1988). In the following sections, we describe DACs and behavioral dimensions in detail; we then discuss relevant research and theory regarding objective and perceived developability and present a three-stage process for DAC dimension choice. We then consider the question of appropriate dimensions from the opposite angle: Are there dimensions that are not typically assessed in selection ACs that might be quite effectively developed in DACs? We conclude by presenting a call not only to researchers to address several pressing questions regarding developability but also to practitioners to make development the central principle of their DACs. This final section intends to provide managers with some practical guidance when faced with the challenge of what dimensions to include in a DAC.

THE DAC PROCESS

A DAC is a collection of workplace simulation exercises and other assessments that provide individuals with practice, feedback, and coaching on a set of developable behavioral dimensions found to be critical for their professional success (Thornton & Rupp, 2003, 2005). Most DACs conform to the Guidelines and Ethical Considerations for Assessment Center Operations (International Task Force on Assessment Center Guidelines, 2000), but there is otherwise little consensus regarding what DACs should look like. In practice, a DAC may be anything from a traditional selection center that provides feedback to a diagnostic launching pad for future development to a self-contained training intervention (Thornton & Rupp, 2005). Increasingly, however, researchers have begun to articulate the many ways in which a truly development-focused AC may differ from traditional ACs (see Table 1). Rupp, Thornton, and colleagues (Gibbons & Rupp, 2004; Rupp & Thornton, 2003; Rupp, Thornton, & Gibbons, 2004; Thornton & Rupp, 2005), influenced by the work of other AC scholars (Ballantyne & Povah, 2004; Boehm, 1985; Carrick & Williams, 1999; Engelbrecht & Fischer, 1995; Griffiths & Goodge, 1994; Jones & Whitmore, 1995; Lee, 2000; Lee & Beard, 1994), have synthesized these ideas into a potential DAC model (see Figure 1) that illustrates how a DAC might be designed to maximize opportunities for development.

As conceptualized here, a DAC need not be merely the preliminary diagnostic step at the start of an employee development program but may be a meaningful training intervention in and of itself and therefore an integral component of the development process (Carrick & Williams, 1999; Rupp & Thornton, 2003; Thornton
To maximize learning throughout the process, a purely developmental DAC may incorporate elements such as training on the dimensions, exercises designed to maximize experiential learning, self-reflection activities, and coaching and goal setting at multiple points throughout the center. Dimensions are made completely transparent to the participants, and care is taken to create a nonthreatening learning environment where experimentation and exploration are supported. Finally, participants are encouraged to engage in further development activities following the DAC to continue improving themselves on the dimensions. If possible, follow-up contacts with participants may be made to track their progress over time and increase the maintenance and generalizability of transfer of training by reminding them of the DAC experience.

The Thornton and Rupp (2005) model is, of course, only one example of how a DAC might be designed. It does, however, highlight the growing emphasis on development in the AC literature and suggest that the DACs of the future may bear less and less resemblance to their traditional AC cousins. As Figure 1 and Table 1 illustrate, the shift from an assessment to a development focus can affect nearly every aspect of DAC design and implementation. Our concern in the present article is whether and to what extent considerations of developability should influence the choice of the behavioral dimensions to be assessed for DACs of all kinds.
BEHAVIORAL DIMENSIONS

Dimensions are defined for AC purposes as clusters of “behaviors that are specific, observable, and verifiable, and that can be reliably and logically classified together” (Thornton & Byham, 1982, p. 117). Dimensions consist of specific behaviors but are general enough to be observable across a variety of situations and tasks (International Task Force on Assessment Center Guidelines, 2000). According to the guidelines, the choice of dimensions should be based on job analysis. Research has shown that a smaller set of dimensions (e.g., three to six) is typically more effective than a larger set of dimensions (e.g., over nine; Gaugler & Thornton, 1989; Sackett & Tuzinski, 2001; Woehr & Arthur, 2003).

The choice of dimensions is critical to the overall effectiveness of any AC program. Dimensions are the currency, foundation, and building blocks of any AC. Failing to systematically identify the dimensions most appropriate for DAC programs is analogous to developing a selection system without conducting a job analysis to identify the knowledge, skills, and abilities necessary for successful job performance—one cannot lose track of the constructs being assessed and developed in the study of the method with which one assesses and develops them (Arthur, Day, et al., 2003). According to Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, & American Council on Measurement in Education, 1999), the validity of an assessment relies on the available evidence supporting its quality. For any AC, this evidence must include information supporting the job relevance of the dimensions. However, we argue that for DACs, information about the developability of the dimensions also represents critical evidence that should be considered as well.

Whether dimensions should be used in ACs at all is the topic of much debate in the research literature (e.g., Arthur et al., 2000; Lance, Lambert, Gewin, Lievens, & Conway, 2004; Lievens & Conway, 2001; Sackett & Dreher, 1982; Sackett & Tuzinski, 2001; Woehr & Arthur, 2003). Analyses of postexercise dimension ratings generally find high correlations between dimensions within the same exercise and low correlations between ratings of the same dimension measured in different exercises (for a recent meta-analysis, see Lance et al., 2004). In light of this, Lance and colleagues recommended disregarding dimensions entirely and scoring each exercise as a work sample; if the exercises are carefully designed to reflect job content, integration of overall exercise ratings should still yield high predictive validity. In their view, dimensions are not at all necessary to the success of the AC method.

Why, then, in the face of this evidence, do we persist in recommending the use of dimensions to DAC developers? One reason is that dimensions play a different role in DACs than in traditional ACs, and it is not clear that they can be so easily dispensed with. Lance and colleagues (2004) were concerned primarily with tradi-
tional selection or promotion centers. Aggregating overall exercise scores may be an adequate means of arriving at an overall assessment rating, but DACs generally provide feedback at the dimension level. It is not clear whether giving exercise-based feedback is likely to improve on-the-job performance (as opposed to simply improving performance in future ACs), and the existing literature suggests few alternative bases for feedback. Attempts to structure traditional ACs around “managerial functions” have not been particularly successful (Joyce, Thayer, & Pond, 1994). Dimensions are the traditional currency of ACs and of job analysis and performance appraisal, because they allow discrete behaviors to be clustered into meaningful categories (Thornton & Byham, 1982). Such categories are helpful in organizing and processing feedback; presenting a long list of individual behaviors can quickly become overwhelming for participants. Regardless of whether dimensions as they are typically used are the optimal set of categories, empirical research is needed to identify alternatives.

Further, evidence exists that dimension ratings are more distinct when judgments are aggregated across exercises (Robie, Osburn, Morris, Etchegaray, & Adams, 2000; Woehr & Arthur, 2003) and that across-exercise dimension ratings are meaningfully related to performance outcomes (Arthur, Day, et al., 2003). More generally, DAC practitioners must keep in mind that the quality of the DAC is highly dependent on the ability of assessors and administrators to provide distinct and meaningful feedback on each dimension. Many design choices can be made in such a way as to make this feat more likely, such as choosing dimensions that have little conceptual overlap (Thornton & Byham, 1982; Thornton & Rupp, 2005), writing clear behavioral definitions that leave little room for confusion, and designing exercises in such a way as to encourage dimension-relevant behavior (Haaland & Christiansen, 2002). We encourage practitioners to remain abreast of research developments in this area, because the body of knowledge concerning DACs continues to expand.

Identifying job-relevant dimensions for use in managerial DACs is not an easy task, but it is at least a well-documented one. A wealth of research and practical advice is available to the practitioner conducting a job analysis (e.g., Chen, Carsten, & Krauss, 2003; McCormick, 1976; Sanchez & Levine, 2001), and guidelines for translating job analytic data into AC dimensions are also well established (International Task Force on Assessment Center Guidelines, 2000; Thornton & Byham, 1982; Thornton & Rupp, 2005). There is also a fair amount of published research that suggests how various dimensions are relevant for managerial success across organizations, industries, and levels (Gaugler, Bentson, & Pohley, 1990). This research is consistent with the general managerial taxonomies found in the broader job performance literature (e.g., Borman & Brush, 1993; Tett, Guterman, Bleier, & Murphy, 2000).

The job analysis process usually results in far more dimensions than can be measured within a single AC; consequently, the AC designer must identify the
most appropriate subset of dimensions, given the context of the overall organization and the purpose of the center (Thornton & Byham, 1982). For traditional ACs, in which the primary purpose is selection or promotion, dimensions are commonly selected based on the degree to which they predict future performance (Thornton & Rupp, 2005). Over time, a substantial body of research has developed regarding which AC dimensions have been most predictive of performance (Byham, 1970; Gaugler et al., 1987; Hardison & Sackett, 2004; Hunter & Hunter, 1984; Schmitt, Noe, Meritt, & Fitzgerald, 1984; Thornton & Byham, 1982). Practitioners can draw on this literature and integrate it with their own job analyses to identify the dimensions that can be expected to best predict performance for the job in question.

For DACs, however, the question of dimension choice becomes more challenging. The job analysis for a DAC is no different from that for a selection or promotion AC, but the fundamental difference in the purpose of DACs and ACs implies that the subset of dimensions chosen for one may not necessarily be appropriate for the other. Whereas ACs are concerned with prediction of future performance, DACs are concerned with providing useful feedback and fostering development. As such, DACs require dimensions on which it is possible to improve, given some amount of time and effort (Thornton & Byham, 1982; Thornton & Rogers, 2001; Thornton & Rupp, 2005). Stable traits\(^1\) are often used for prediction (i.e., in selection ACs) precisely because they are unlikely to change (Howard & Bray, 1988). Though participants may find it helpful or informative to receive feedback on such dimensions (cf. Jones & Whitmore, 1995; Thornton & Byham, 1982), it is difficult to see how this feedback will lead to improvement in performance (Thornton & Rupp, 2005). At a minimum, such feedback should make the stability of the dimension explicit so that the recipient can turn his or her efforts to working around the deficiency instead of trying fruitlessly to overcome it. This, however, requires a clear understanding of the developability of the dimensions.

**DEVELOPABILITY**

The idea that different skills can be learned at different rates is intuitive, and research has long supported this notion, at least with respect to basic skills (e.g., McGeoch, 1929). At present, the available training and development literature offers many general principles of learning (e.g., Salas & Cannon-Bowers, 2001; Wexley & Baldwin, 1986) and many descriptions of successful development inter-

\(^1\)We use the terms *trait*, *traitlike*, and *stable* with much caution. To conform with the guidelines, all dimensions must be defined in behavioral terms. Thus, even cognitive and personality traits need to be defined behaviorally if assessed in an AC context. Many personality researchers use behavioral definitions (e.g., Buss & Craik, 1983), even for traits that are believed to represent relatively stable individual differences. Our concern here is with the learnability of the behaviors associated with a given trait or dimension label; thus, the critical word in this phrase is not *trait* but *stable*. 
ventions but only a few comprehensive, well-delineated theories about which skills may be developed by what means. Hellervik, Hazucha, and Schneider (1992) proposed a model of behavior changeability. This model posits that changeability is driven by the complexity of the behavior to be learned. That is, complex skills—according to Hellervik et al., those strongly correlated with cognitive ability—are more difficult to learn than simple skills, and specific skills such as learning a technical procedure should be easier to learn than broad ability domains such as verbal ability. Using Campbell’s (1990) taxonomy of job performance behavior, Hellervik et al. (1992) offered several examples of behaviors that might be easy to develop (e.g., “write a grammatical sentence”) and difficult to develop (e.g., “prepare a scientific treatise”; p. 840). They take a within-dimension approach rather than a between-dimension approach, emphasizing that the developability of a behavior or skill is determined by its complexity rather than the dimension to which it belongs. Brush and Licata (1983) provided a different framework for identifying learnable skills. They proposed that skills that primarily depend on cognitive processes, such as acquiring specific knowledge or following set procedures, are the easiest to develop, whereas the development of skills requiring interpersonal interaction or noncognitive elements (i.e., changes in attitudes, dispositions, or values) prove more challenging. Waters (1980) offered a somewhat more detailed model, distinguishing managerial skills according to the degree of behavioral specificity with which they are defined. He argued that practice skills and insight skills can be learned within a relatively short interval—a span of hours or days—whereas context skills and wisdom might take several weeks or months. Practice skills (e.g., active listening) are behaviorally specific (as AC dimensions are intended to be), whereas insight skills (e.g., “dealing with peers,” p. 451) are considered behaviorally nonspecific. Waters took a fairly optimistic view of development, assuming that most skills can be developed in time, but Brush and Licata (1983) expected that some skills would display “low learnability” (p. 33).

Although the ideas proposed by Brush and Licata (1983), Hellervik et al. (1992), and Waters (1980) are clearly relevant to the question of dimension choice for DACs, none of these works presents empirical evidence in support of those ideas. Nor does it appear that any systematic evaluation of any of these theories has been conducted to date, either by the original authors or by others. The bulk of research reports regarding managerial skill development focuses on a single dimension or a cluster of related dimensions, and explicit comparisons of developability between dimensions are rare. However, some tangential evidence exists. For example, Norman (2003) assessed the effectiveness of a trust-building training program that included aspects of leadership and listening. She found that participants’ subordinates reported seeing improvement in what she termed scheduled behavior (specific activities that occur at designated times in the course of the job, such as formal coaching) but not in ongoing behavior (relationship-oriented activities that can occur at any point, such as listening). This is consistent with Brush and
Licata’s hypothesis that skills that involve following a method or procedure (such as running a scheduled coaching session) can be learned more quickly than can skills involving less structure and more variable human interaction.

**PERCEPTIONS OF DEVELOPABILITY**

A growing body of research indicates that objective evidence of developability may not be the only basis on which to determine whether development is likely to occur. Recent social psychological research regarding implicit theories has shown that individuals vary in their beliefs about the malleability or permanence of various attributes (e.g., intelligence, personality) and that these beliefs predict a number of behaviors (e.g., Dweck & Leggett, 1988), many of which are particularly relevant to development. For example, people who believe that intelligence is changeable are more likely to persist in challenging learning tasks than are those who hold an implicit theory that intelligence is fixed (Diener & Dweck, 1978, 1980). Similarly, Dunning (1995) found that the importance of traits and their perceived modifiability affect the degree to which people display self-assessment versus self-enhancement preferences for receiving feedback. People who perceived a trait as being changeable were more interested in receiving accurate feedback, but those who viewed the trait as being fixed had a stronger preference for favorable feedback. Implicit theories about developability appear to be domain specific; students’ theories about the changeability of their academic interests predicted persistence in their chosen majors, but their theories about intelligence did not (Zuckerman, Gagne, & Nafshi, 2001). This finding suggests that people’s beliefs about the developability of specific dimensions are likely to influence their development behavior relative to those dimensions.

This research is critically important for practitioners developing DAC programs, because it implies that development behavior in or following a DAC may depend greatly on the participants’ individual beliefs about whether the dimensions assessed are developable. The findings described here suggest that people will be interested in attending a DAC, engaged in the process, and responsive to feedback when they believe that there is a real probability that they can develop as a result. Conversely, research indicates that when people do not believe that they can change with respect to a given competency and when they believe that their present level of ability is low, they are likely to avoid challenges and other activities that foster development (Dweck & Leggett, 1988).

This is not to say that perceptions of developability are more important than objective developability or that DAC designers should incorporate dimensions that are widely believed to be developable without regard for evidence about their actual developability. Some dimensions may prove, if not impossible to develop, at least very difficult or not appropriate for development via DAC methods. However, the DAC designer must also keep in mind that objective evidence of developability does
not necessarily lead to perceived developability. Participants may not be aware of or influenced by research evidence showing that a skill can be developed. For example, despite many studies describing successful interventions to increase creativity (e.g., Basadur, Wakabayashi, & Takai, 1992; Roland, 1998), many people believe that creativity is an inherent, stable characteristic. Zuckerman et al. (2001) argued that the interaction of beliefs and evidence about developability is important; in other words, believing that dimensions can be developed is beneficial when they are in fact developable but not if they are stable or fixed. The best dimensions for a DAC, then, should be those that are relevant to job success, that can be shown to be developable, and that are seen as being developable by the participants.

**CHOOSING DAC DIMENSIONS**

In choosing dimensions for any AC, the practitioner’s main task is to identify the set of dimensions that are relevant for the job in question and then determine which subset of those dimensions should be used for the center. It is possible that considerable overlap exists between the subset of dimensions that are most appropriate for ACs and the subset that is best for DACs, or it is possible that the overlap is slight. Designers who assume that the subsets are identical run the risk of investing in a costly, time-consuming process that may not produce the desired results. Further, identifying objectively developable dimensions alone may not be sufficient if they are not also perceived as being developable. Of course, development cannot be expected to occur on dimensions that are perceived as being developable but are not actually so; dimensions that are accurately perceived as being developable constitute a subset of the objectively developable dimensions. Because the research on implicit theories has not yet specifically examined managerial performance dimensions, it is not yet possible to say what proportion of developable dimensions are likely to fall into this subset.

Figure 2 illustrates the process for choosing DAC dimensions to maximize the opportunity for development:

1. Begin by identifying a set of job relevant dimensions.
2. Choose from that set the dimensions that have been shown to be amenable to development.
3. Choose from the resulting subset those dimensions that are perceived by most of the target population as being developable.

**NONTRADITIONAL DIMENSIONS**

In Figure 2, the best dimensions for DACs are described as a subset of the available job-relevant dimensions. This might suggest that DAC developers should focus on
selecting the most developable dimensions from the set commonly used in traditional ACs. However, it is important to note that there may be dimensions that fall within the set of job-relevant dimensions but are not typically assessed by ACs. For selection or promotion ACs, the best dimensions are those that are most predictive of future potential. Often, this means that ACs focus on relatively stable characteristics (Howard & Bray, 1988) and basic abilities such as problem solving and interpersonal communication (Thornton & Rupp, 2005). If a person possesses reasonable ability in these areas, he or she can presumably be taught more specific skills later on the job. We have already argued that DACs may be better served by using developable, not stable, dimensions. Here, we note that DACs may be a highly appropriate way to address the specific skills eschewed by traditional ACs. Additionally, the rapid rate of change in today’s workforce (Howard, 1995) often means that dimensions that would not have been important at the time that a manager was hired may become extremely important during the manager’s tenure.

A concrete example is helpful here. Recent research makes a strong case for the importance of fair behavior on the part of managers (e.g., Colquitt, Conlon, Wessom, Porter, & Ng, 2001; Colquitt, Noe, & Jackson, 2002; Cropanzano, Rupp, Mohler, & Schminke, 2001; Liao & Rupp, 2005; Mossholder, Bennett, & Martin, 1998; Naumann & Bennett, 2000). There also exists evidence that fairness is a learnable, trainable skill (Cole & Latham, 1997; Skarlicki & Latham, 1996, 1997). An organization might wish to improve the overall level of fairness among its managers, but selecting new managers for their proficiency in fairness may seem impractical or even unfair, given the newness of this research and the fact that few managers will have received previous training in fairness. Fairness would be an unlikely candidate for inclusion in a traditional AC. However, a DAC might prove an ideal venue to introduce such a skill, explain its importance, assess participants’ existing proficiency, and provide constructive feedback and practice. A similar ar-
gument could be made for cultural sensitivity, technology-mediated communication, and other specific but complex skills that might be relevant to a particular job but not appropriate for use in a selection AC. We encourage DAC developers to consider the entire set of job-relevant dimensions, including those that might be overlooked in ACs for selection purposes and to consider how DACs may be used to develop these less-traditional skills.

RECOMMENDATIONS FOR RESEARCH

The concept of developability of performance dimensions needs further explanation. Our purpose in the present section is to propose a framework for future research in this area and to make practitioners aware of the gaps and issues that presently exist. A comprehensive analysis of the extent to which each performance dimension can be developed must include several aspects of development, including changeability, time required, and methods of change. Characteristics of the dimension itself should also be considered, such as complexity (Hellervik et al., 1992), specificity (Waters, 1980), and cognitive or interpersonal orientation (Brush & Licata, 1983). In addition, it is quite possible that various aspects of a dimension may develop at different rates. For example, both nonverbal communication and audience-appropriateness are elements of oral communication. It may be quite easy to develop nonverbal communication techniques such as eye contact and effective gestures, yet considerably more in-depth training may be required to learn how to gauge the appropriateness of one’s communication for one’s audience (cf. Hellervik et al., 1992; Waters, 1980). Future research is needed that explores the developability of the broad dimension classes and the individual behaviors of which they are composed. The top half of Table 2 presents a preliminary scaling of a few dimensions along such a continuum. The location of these initial dimensions is tentative, though suggested by previous research and experience (Brush & Licata, 1983; Hellervik et al., 1992; Waters, 1980). Systematic study over time is needed to confirm or refine the proposed scaling.

In addition to changeability, one must consider the element of time that is implied in the notion of developability (Waters, 1980). Some dimensions may be changed relatively quickly with little effort, whereas improvement in others may require considerable effort over an extended period of time. Knowing when development can be expected to take place is a critical issue for practitioners who must account for the effectiveness of their interventions. The element of time may also include consideration of maintenance of change and transfer to the work environment (cf. Baldwin & Ford, 1988).

A final consideration involves the methods most effective in improving performance for each dimension. A recent meta-analysis (Arthur, Bennett, et al., 2003) found that training methods may be differentially effective for different kinds of
<table>
<thead>
<tr>
<th>Dimensions/competencies</th>
<th>Nearly Impossible to Develop</th>
<th>Very Difficult to Develop</th>
<th>Difficult to Develop</th>
<th>Reasonable Possibility to Develop</th>
<th>Somewhat Easy to Develop</th>
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<td>Counseling</td>
<td>Feedback alone</td>
<td>Participation in simulation alone</td>
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<td>Education programs</td>
<td>Lecture</td>
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<td>Courses</td>
<td>On-the-job experience with coaching</td>
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<td>Mentoring</td>
<td>Skill practice</td>
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skills, but the authors noted that the reason for this is not yet clear. Systematic research is needed to identify the factors that influence the rate and degree of development for various dimensions, as is research that explores the types of interventions needed to develop various dimensions. For some dimensions, improvement may come with little more than the opportunity to participate in some activity that gives the participant self-insight, which can then readily result in behavioral change. Research findings suggest that AC participants can in fact gain such self-awareness, even before feedback is given (Schmitt, Ford, & Stults, 1986). By contrast, change in other dimensions may require extensive formal education or in-depth, lengthy, and individualized training. These elements can be incorporated into a long-term DAC program, such as the longitudinal DAC model proposed by Thornton and Rupp (2005), but would require substantial amounts of time, resources, and organizational buy-in. The lower half of Table 2 presents a preliminary scaling of intervention methods along the continuum of developability.

The multiple aspects of the extent to which various performance dimensions can be developed require further theoretical and empirical investigation. To create programs that effectively improve managerial competencies, DAC architects must thoroughly explore not only which dimensions (or aspects of each dimension) are most developable, but also which interventions and time frames are most appropriate for each. Past research has provided some insights into some of the answers such an investigation may yield.

For example, time and experience alone may be an effective developmental tool for some individuals and some dimensions but not necessarily for all. One of the most comprehensive studies of managerial development, the longitudinal Management Progress Study (Howard & Bray, 1988), found a general pattern of improvement in cognitive skills (defined as problem analysis and decision making) over time but a general decline in interpersonal skills. The data also suggest that development over time was at least partly a function of the ability level of the participants such that high-ability managers experienced performance gains over the first 8 years of assessment but that low-ability managers experienced performance losses. These findings imply that those who need to develop the most are not likely to develop over time in the natural course of experiential activities on the job. More research is needed to establish the characteristics of dimensions and individuals that make development most likely.

Other research offers information about specific types of interventions that have proven effective in managerial development. For example, interventions based on social learning theory (Bandura, 1997), in which effective behaviors are modeled for participants, show promise. In the arena of supervisory training, programs following principles of social learning theory (Goldstein & Sorcher, 1973) have shown positive results (Latham & Saari, 1979). These studies provide clues to promoting actual improvement in performance dimensions through DACs. Participants’ skill development in a DAC may benefit from being provided with several
guidelines or tools not common in traditional ACs. These include a conceptual model for handling the situations present in simulation exercises, clear step-by-step instructions on the actual behaviors that would be effective in handling each situation, and feedback on the effectiveness of initial behaviors followed by an opportunity to express similar behaviors in later simulation exercises.

RECOMMENDATIONS FOR PRACTICE

The need for information about dimension developability poses a quandary for practitioners seeking to develop DACs. Obtaining empirical evidence about the effectiveness of DACs in improving particular dimensions requires existing DACs from which such evidence can be collected. Until a substantial body of evidence develops concerning the effectiveness of DACs for developing various dimensions, practitioners must seek alternative bases for choosing dimensions to include in DACs. The best places to start include (a) consulting the existing research literature regarding the developability of individual dimensions using other training methods and (b) investigating participants’ (and other subject matter experts’) beliefs about developability. Our discussion of developable performance dimensions does suggest a number of general principles for the development and administration of DACs. These include retaining focus on development; carefully choosing dimensions; building participant self-efficacy; considering the effects of culture, differential development across individuals, and differences in DAC implementation on the DAC process; and evaluating effectiveness by measuring development.

Ensure That the Focus Remains on Development

Although quality assessment is necessary for providing accurate feedback, trade-offs between accuracy of assessment and developmental opportunity are likely to arise in the process of DAC development or administration. For example, providing feedback between exercises is beneficial from a developmental standpoint but problematic from an assessment standpoint. Using the same AC for both assessment and development can create numerous problems (for a detailed discussion of this issue, see Thornton & Rupp, 2005); nonetheless, this practice is common in organizations. Though we discourage the use of such hybrid centers, if they must be used, it is necessary to clearly identify one purpose—assessment or development—as primary and the other as secondary. Unlike traditional ACs, the primary deliverable of DACs is not overall assessment ratings or a set of recommendations but actual performance improvement. Thus, DAC developers must be aware both of measurement issues and of general principles of training and learning, and they must work to ensure that these issues are given sufficient emphasis.
Choose Dimensions Carefully

Though the DAC process is meant to provide opportunities for immediate development, not all dimensions in the program must be amenable to quick improvement. Consideration should be given to the time frame in which development is anticipated to occur. Development on some dimensions, such as oral communication, may occur during the DAC program, whereas improvement on other dimensions, such as planning and organizing, may appear after some weeks of practice. Positive change on some dimensions may require long periods of coaching or formal education to achieve. Even those dimensions that are perceived as being difficult to develop may be approached by providing feedback, setting goals, and suggesting training interventions. However, at least some of the dimensions should have the potential for development within the program or shortly after. Practitioners should keep these issues in mind both when choosing dimensions and when evaluating the effectiveness of the development program. The time horizon for development may also affect participants’ (and management’s) perceptions of developability. Long-term, difficult dimensions may be perceived as being undevelopable, which may lead to resistance. Therefore, special attention should be given to ensuring accurate conclusions about the developability of these dimensions and managing participants’ efficacy for improving on them.

We warn readers not to conclude, given the arguments presented in this article, that nondevelopable traits are completely out of place in DAC programs. Although training on dimensions that cannot be developed may result in discouragement and learned helplessness, there may be utility in giving feedback on undevelopable traits to help participants learn to compensate for deficiencies in such areas. For example, a participant with a deficiency in a specific cognitive skill may not be able to improve himself or herself on that particular dimension. However, with appropriate feedback and coaching, this person may be able to learn ways around this limitation so that he or she can obtain equally effective results through other means. As mentioned, job relevance is the first criterion for including dimensions in the DAC program. If a nondevelopable dimension is highly relevant to a particular job but workarounds exist so that a lack of ability can be overcome, including the dimension in a DAC program may be beneficial for participants and the organization. Accurate feedback regarding a nondevelopable dimension may help people identify and implement such workarounds, improving performance overall even though the dimension per se is not improved. DAC developers should also think critically about how best to measure nondevelopable traits, in that traditional paper-and-pencil measures may be more appropriate than behavioral simulations in this case.

Build Participant Self-Efficacy

It is likely that many dimensions will prove to be both objectively developable and perceived as developable. However, situations may arise in which participants’
perceptions do not match the objective evidence regarding developability (e.g., creativity). Thus, it is important to build efficacy for development by discussing the developability of the dimensions to ensure that participants share an optimistic view of the likelihood of performance improvement. Self-efficacy for learning is a critical component of development (McCauley & Hezlett, 2002); failure to generate efficacy or to include some dimensions that participants view as being improvable within a short time frame may generate responses of helplessness, negative attitudes, lack of motivation, and perceptions of lack of ability (Dweck, 1996). Orientations to DAC programs should address the absolute potential for development of each dimension as well as the anticipated time frame. This activity will contribute to resolution of misperceptions, development of realistic goals, and generation of increased motivation.

Consider the Effect of Culture

The culture in which the DAC is administered should be a crucial consideration in selecting the dimensions and exercises for the program. Differences in perception of importance, developability, and opportunities to improve performance outside of the DAC program are likely to affect participant perceptions of the usefulness of the process and influence the effort they exhibit. DACs should not be transported from one culture to another without examination of differences that may affect the effectiveness of the program.

Acknowledge Differential Development Across Individuals

Practitioners should be mindful of the role that individual differences may play in moderating development. For some participants, feedback alone may spur development on some dimensions, whereas little effect is seen for other people. A meta-analysis by Collins et al. (2003) found overall AC ratings to be significantly related to cognitive ability (.67), extraversion (.50), emotional stability (.35), openness (.25), and agreeableness (.17). Although the role of individual differences in changes in AC ratings has not been examined, the possibility of individuals’ experiencing differential rates of change due to cognitive ability (cf. Hulin, Henry, & Noon, 1990) or personality characteristics is a potential factor that could affect DAC results.

Consider Variance in AC/DAC Practices

The principles proposed in this article and in future studies of DACs should be applied with the acknowledgement that many ACs in use serve multiple purposes. The consequences of decisions (such as dimensions to be included) have different
effects for ACs with the purpose of development than for those with the purpose of selection. Even among development-only centers, purpose and implementation can vary widely: One DAC may be designed to prepare fast-track candidates for future promotions, whereas another may aim to correct current performance deficiencies. A single center may be unable to fulfill both objectives. Just as there is no typical AC (e.g., Thornton & Rupp, 2005), there is no typical DAC, especially given the newness of this area and the scarcity of empirical research. Only through future research and scholarly dialogue with practitioners can a general, consensus DAC model emerge. Regardless of design particulars, DAC practitioners must consider development issues (including dimension choice) and how the program can best be aligned with organizational goals.

Evaluate Effectiveness

As mentioned, the ultimate deliverable for DAC programs is performance improvement. Though DACs are popular in organizations, only a handful of studies thus far have evaluated the degree to which they are effective in producing such improvement (Engelbrecht & Fisher, 1995; Jones & Whitmore, 1995). Practitioners implementing DACs can make a substantial contribution to knowledge in this area by evaluating their DACs as they would any other training intervention (e.g., through pretest–posttest designs, control groups, consideration of multiple criteria; Kirkpatrick, 1967; Kraiger, Ford, & Salas, 1993). The recommendations in the present article suggest ways in which DAC designers can conduct strong tests of effectiveness by ruling out possible explanations for failure to develop (nondevelopable dimensions, low self-efficacy for learning). If well-designed DACs can be shown to be effective, then researchers can begin to investigate which design features are responsible for the effects and what boundary conditions may exist.

DACs appear to hold much promise as training and development interventions, yet a large number of questions must be answered before DACs can realize their full potential. Our purpose has been to call attention to one such question: How does one identify the most appropriate dimensions for a DAC? Borrowing performance models from traditional ACs does ensure that the dimensions used are job relevant, but such dimensions may not be the most amenable to development attempts. If the goal of DACs is to change behavior and improve performance, they will be most effective when they address important, job-relevant dimensions that can be developed given time and effort and that are understood to be developable by the participants. Failure to meet any of these three criteria will hinder the development of the participants and reduce the impact of the DAC. Much additional research is needed to identify which dimensions are most developable, how each is best developed, and in what time frames improvement can be expected. The pres-
ent article provides a preliminary framework for researchers to explore these ques-
tions and for practitioners to make wise choices in designing DACs. It is our hope
that researchers and practitioners will rise to the challenges presented here so that,
in time, we will have a substantial body of evidence upon which dimension choice
in future DACs can be based.

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