Understanding physician leadership: the mediating effects of positive organizational climate and relational role endorsement

Joann Farrell Quinn
Department of Medical Education, University of South Florida, Tampa, Florida, USA, and

Philip Cola
Case Western Reserve University, Cleveland, Ohio, USA

Abstract

Purpose – The purpose of this paper is to seek clarity on the factors that increase acceptance of a leadership identity and influence a physician leader to participate in the leader role at a higher level.

Design/methodology/approach – To explore the direct and mediating effects of positive psychological climate (PPC) and role endorsement (RE) on physician professional participation (PP) in leadership, a survey was disseminated to members of the American Association of Physician Leadership.

Findings – Findings show that positive relationships support the individual in acceptance of a second identity as a leader, therefore, to a higher level of PP. The double mediation with PPC and RE found in this model warrants additional meaning toward the cultivation of positive relationships.

Research limitations/implications – A broader understanding of physician leadership may benefit from a more comprehensive collection procedure other than self-reported data, including one in which data is collected in a 360-degree feedback format.

Practical implications – Role endorsement serves as a mediating mechanism to PP (citizenship behaviors) for both PPC and social intelligence competencies. These data indicate that the presence of role endorsement for physicians changes their degree of participation and impacts their own role identity. This immediately helps to direct development efforts for physicians during their transition from physician to physician leader.

Originality/value – This study confirms the mediating relationship of RE upon the PP of physician leaders, with both implications for practice and a broader understanding of the nature of physician leadership.

Keywords Emotional intelligence, Organizational citizenship behavior, Physician leadership, Leadership identity, Relational climate

Paper type Research paper

Introduction

Physicians have long held leadership roles in healthcare organizations and, despite the many changes in healthcare, physicians as leaders are critical to the success of these organizations, perhaps more so than ever before (Weiner *et al.*, 1997). In fact, a recent study shows that hospitals in physician-led hospital systems have higher quality ratings than did non-physician-led hospitals (Tasi *et al.*, 2019). Yet, the number of physicians leading hospitals has been in decline, with less than 4 per cent of hospitals headed up by physicians in comparison with 35 per cent in 1935 (Gunderman and Kanter, 2009). In spite of the importance of physicians as leaders, there is a lack of emphasis and training on leadership skills for physicians beginning in medical school (Blumenthal *et al.*, 2012) and continuing into their professionalization as clinicians.

While physicians have held leadership roles, as the beginning of organized medicine, there is not a clear understanding of the nature of physician leadership. Stogdill (1948) informed us that leadership was associated with initiative and willingness to assume responsibility. Yet, physicians are lauded for their technical expertise and often do not place equal value upon their role as a leader, instead prioritizing their clinical identity (Quinn and Perelli, 2016). Additionally, empirical evidence has surfaced that indicates a thread of relational capacity is important for physician scientists to succeed (Cola and Wang, 2017), yet this too may be lacking with physicians not recognizing acceptance and support for their leadership role by peers and administration (Quinn, 2015). The concept of building and working toward relational capacity seems at times contradictory to emerging as a leader. It is not a triple bottom line approach. The relational aspect actually brings them more in line to identify with being a physician. The purpose of this inquiry is to seek further clarity on the factors that increase acceptance of a leadership identity and influence a physician leader to participate in the leader role at a higher level. Therefore, what are the potential causal factors that are

necessary for a physician to find value in participating in leadership roles?

This paper begins with a review of the literature on physician leadership, social intelligence (SI) competencies, identity and role endorsement (RE), positive psychological climate (PPC) and organizational citizenship behaviors. Building upon these literature streams and theories, a theoretical framework is developed along with an associated set of hypotheses. The paper then delineates the research methodology and sample, analysis of the results and discussion of findings. Finally, the paper concludes with a discussion of the implications to research and practice.

Theoretical foundation

The purpose of this review is to identify the existing literature, which supports the model of physician leadership delineated subsequently. Specifically, physician leadership literature is reviewed while exploring the social competencies of physician leaders explained by theories on emotional intelligence (EI). Next, PPC is defined and RE through the review of theories on affect, climate and social identity are outlined. Finally, a review of the dependent measure of organizational professional participation (PP) denoting organizational citizenship behavior is provided.

Physician leadership

While many leadership theories have emerged as to what a leader is and what constitutes an effective leader, none have specifically defined the nature of physician leadership. This concept of physician leadership is undergoing constant change as it is defined by the need for physicians to be bridges, focusing on both their identity as a clinicians and organizational leaders.

Physician leadership is a unique domain of inquiry and has been characterized as being plagued by a "lack of respect for physician leadership" (O'Connor and Fiol, 2006, p. 73), by physicians themselves. This idea comes from the belief that because a physician has been trained technically in a divergent way from traditional leadership that they cannot readily transition those skills into a leadership role. This is in contrast to studies of traditional leadership theory. The notion that physicians may not value leadership emerges as the most important factor in differentiating physician leadership from mainstream leadership theory. If this is the case, to increase the meaning of leadership to physicians, it must be done through integration with existing values, which is unique to those individuals in a professional services environment.

Physician leaders often, and at least initially, hold part time and temporary leadership roles; and while they may have a lack of respect for physician leadership in general, it is also an even greater likelihood that they may lack respect for their own role as a physician leader (Chaudry et al., 2008; O'Connor and Fiol, 2006). Previous studies have guided our understanding of the unique nature of physician leadership, and it was found that physicians do not want to self-identify as leaders; and even when their current predominant role is as an organizational leader, they will almost always only identify as a physician (Quinn and Perelli, 2016).

Aside from whether there is an inclination to engage in formal leadership development, the idea that physician leaders can be developed early on is also problematic when reviewing the results of the MD-MBA pathway to creating physician leaders. Over the previous 20 years at Duke University, only 24 of 32 MD-MBA graduates entered the National Residency Match Program and ended up in residency programs (Ackerly et al., 2011). It seems that while MD-MBA programs offer a pathway to physician leadership, many of these physicians are opting out of clinical practice before they even begin, instead choosing to pursue managerial roles. This most likely negates the significance of their medical training upon their impact as a physician leader, as their peers neither see them as clinicians nor do they have the ongoing clinical perspective that is unique to physician leaders.

While a formal leadership role may not be a "desired" role for a physician, all physicians are leaders within their own clinical practice (Chaudry et al., 2008). A physician may choose to rely upon their training and education for technical challenges, such as those in their clinical practice; however, understanding the difference may provide the opportunity to use adaptive leadership practices to the issues that arise involving innovation and quality improvements. Physician leadership needs to be based upon the belief that physician leadership roles are excellent leverage points for improvement in health care quality (Reinertsen, 1998).

The way that one perceives him or herself and that individual's understanding of their self-identity has a significant impact upon the way a person feels, thinks and ultimately behaves. If a person relies upon their identity to direct their behavior, then this is an important consideration in his or her understanding of him or herself as a leader. This includes the understanding of individual competencies, as well as those areas where there may be gaps, and using those competencies in the construction of a self-concept.

Social intelligence competencies

The study of emotional and social competencies falls within the framework of EI. Numerous scholars have developed models of EI with significant theoretical distinctions, which can be classified into three streams, namely, abilities measures, self-reports and mixed competencies models (Ashkanasy and Daus, 2005). Each stream of EI is conceptually distinct, with Stream 1 including abilities measures, such as the Mayer–Salovey–Caruso EI (MSCEIT) test (Mayer et al., 2003). The MSCEIT was created to contrast the authors definition of EI from general intelligence measures with correct or incorrect responses (Mayer et al., 2003). The MSCEIT focuses on the respondent's' ability to perceive, use, understand, and regulate emotions (Mayer et al., 2002).

Stream 2 includes self-report measures in terms of traits (Andrei et al., 2016). Stream 3 includes competency measures, such as the Bar-On EQ-i (2004) and Boyatzis and Goleman's (2007) (emotional and social competency inventory [ESCI]). The bar-on model of emotional and SI (as measured by the EQ-i) has been developed into a behavioral model to assess:

> [...] a cross-section of interrelated emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands (Bar-On, 2006, p. 14).

Stream 3 focuses on exploring SI competencies, as this stream includes the mixed-competency model created by Boyatzis and Goleman (2007) as measured by the ESCI. Boyatzis (2009) has defined EI competencies as a self-awareness cluster of competencies that relate to one's own emotions and an understanding of personal preferences and states of being, and a self-management cluster that refers to one's ability to maintain control over his/her emotions, adapt to change, continually work toward personal improvement and maintain a positive outlook. SI competencies are comprised of two clusters of competencies. The first is social awareness, which refers to an understanding of others' emotions, evidenced through an understanding of a group's emotions and interpersonal relationships; the second cluster of SI is relationship management, which relates to "skill or adeptness at inducing desirable responses in others" and can be as associated with coaching and mentoring, inspirational leadership, influence, conflict management and teamwork abilities (Boyatzis, 2009, p. 754).

Van Rooy and Viswesvaran (2004) conducted a meta-analysis to assess incremental validity and found support for EI, although the results were mixed. Ashkanasy and Daus (2005) have also noted that the mixed models may have conceptual overlaps with other measures, yet they strongly predict job performance, and Cherniss (2010) found that mixed models may have greater predictability. As these analyses, many measures of EI have been updated to address limitations. A recent meta-analysis found that EI is positive related to a variety of important job-related outcomes, including job performance, even when controlling for cognitive intelligence and personality (Miao *et al.*, 2016).

Hopkins *et al.* (2015) have identified several defining EI competencies specific to physician leaders, including empathy, initiative, self-awareness and organizational awareness (Hopkins *et al.*, 2015). This provides support for their inclusion in exploring the context of physician leadership and the behavior of physician leaders.

Role endorsement

Social identity is based upon the individual's perception of themselves as a member of a group of persons (Ashforth and Mael, 1989), which is formed from the categorization of members and influenced by the distinction and prestige of the identity group. Tajfel (1972) originated the theory of social identity and defined it as "the individual's knowledge that he belongs to certain social groups together with some emotional and value significance to him of this group membership" (p. 292). Hogg (2001) has also noted that "if leadership is indeed a structural feature of in-groups, then leaders and followers are interdependent roles embedded within a social system bounded by common group or category membership" (p. 186).

"Leaders exist only in relation to the people whom they lead" (Reinertsen, 1998, p. 837); therefore, leaders are born of the social environment and processes in which they exist. An important consideration of the leadership development process is the process of self-categorization and depersonalization (Hogg, 2001), as well as the individual internalization of the leadership identity, relational recognition by followers and

collective endorsement by peers (DeRue and Ashford, 2010) (Figure 1).

This theory is supported by previous inquiries into physician leadership, where it was found that the creation of a secondary leadership identity for a physician, embedded in the primary identity of clinician, involves the individual acceptance of their leadership identity, the relational recognition of that identity and also the organizational authority to enact their role (Quinn, 2015).

Individuals define their identity through membership within various groups, such as work groups, organizations and as members of a profession (Ashforth and Mael, 1989; Tajfel and Turner, 1985). Social settings determine the characteristics of people likely to be in that environment (Goffman, 1963). Further, the individual's social identification is dependent upon perception of in and out-group status, thereby exacerbating the impact of professionalization into an esteemed profession and the impact upon the individual in their view of their own social identity group, as well as other groups that they interact with on a professional basis. The physicians' social identification process places them and others into categories of classification within their environment and separates themselves as physicians from others in the organization; others who they may need to collaborate with when they move into leadership roles.

The process of professionalization occurs through the several years of education that a physician completes, as well as the ongoing socialization into the profession (Hall, 2005). Professionals go through a process of self-categorization, which accentuates the similarities of individuals belonging to the same category and the differences of those in different categories (Hogg and Turner, 1985). Through this process, individuals are depersonalized and construed as in-group and out-group members (Hogg *et al.*, 1995). As physicians adopt a professional identity, depersonalization occurs; however, this is *not a negation* of identity, instead the individual changes the perception of his/her identity to that of the group he/she identifies with (Hogg *et al.*, 1995).

Through this process, physicians become entrenched in their identity as a physician. They become so rooted in this professional identity that physicians often hold on to their primary identity, even when they accept a leadership role

Figure 1 Individual, relational and organizational construction of identity
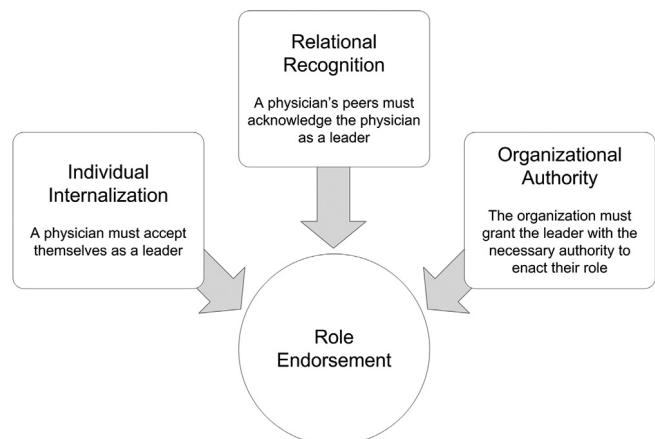
(Montgometry, 2001). The significance of their identity is born from their expertise, and this focus on their own valuation of their identity is further reinforced through their professional group.

While social identity theory does not specifically address "roles," it does attempt to account for role-related behaviors of individuals (Hogg *et al.*, 1995). Individuals acquire meaning and clarifying their own role (s), as well as the roles of others through a series of reciprocal social interactions (Burke and Reitzes, 1991). Physicians assume their own role identity as they interact with other physicians, nurses, administrators and professionals within the organization, and through this interactive process they develop self-meaning and definition. The role of physician then creates a norm for behavior, and in turn "the self as a structure of role-identities [. . .] operate (s) as a social force, affecting the structure of society by affecting behavior in important ways" (Callero, 1985, p. 203, citing Rosenberg, 1981).

Identity theory also informs us that role-identities are hierarchically positioned, thus having differing effects upon behavior (Callero, 1985; Hogg *et al.*, 1995). This phenomenon, identified as identity salience (Stryker, 1968), may affect physician behavior when a second role identity of leader is added to a clinician's behavioral repertoire. While physicians often assume part or full-time roles as department chairs, committee members and/or directors, the primary identity as clinician remains in the forefront. We suggest that the intersection of how an individual feels about their own role, the relational validation that they receive from their peers, and the organizational endorsement they receive in the way of supporting them in their role are the components of RE. With endorsement at all three levels, only then can an individual adopt a secondary identity.

This is predicated on the proposal by DeRue and Ashford (2010) that, if a person claims leadership in a setting, but others do not reinforce that claim with support then the leadership identity construction is insufficient for a leader-follower relationship to emerge. The initial inductive qualitative inquiry examined physician leaders who held part-time leadership roles, as well as full-time clinical roles and found that peers relate to physician managers as "tribe" members and often not as leaders (Quinn and Perelli, 2016). These findings support the importance of RE.

However, the self is developed not only by an understanding of ourselves and formed by our social interactions but also is shaped by the environment in which we operate.

Positive psychological climate

Several researchers have proposed sets of perceptually based attributes that describe psychological climate, including how the environment is perceived and understood (Insel and Moos, 1974; James and Jones, 1974; Locke, 1976), which James and Jones (1974) specifically define as the meaning that people attribute to their jobs, co-workers, leaders and performance expectations, opportunities for promotion. James *et al.* (2008) suggest that the fundamental aspect of climate is "that perceptions of work environments appear to factor into domains interpretable in terms of personal values," (10) which they base upon a review of exploratory factor analyses of

psychological climate variables and the congruence with Locke's (1976) factors of values and psychological climate. James and James (1989) conclude that individuals respond to environmental factors based upon their emotional relevance to their own happiness, "and the key substantive concern of perception is the degree to which individuals perceive themselves as being personally benefited as opposed to being personally harmed (hindered) by their presence in the environment" (p. 748).

In an effort to understand any behavior, it is important to take into consideration the influential factors; therefore, an understanding of psychological climate is imperative as the individual's perceptions and valuations of the environment are what mediate the individual's behavioral responses, not the environment itself (James and Jones, 1974). Within this study, conceptualizations of psychological climate are measured and analyzed at an *individual* level, not those collected and constructed as an aggregate to measure organizational climate. As well, when psychological climate data is collected from individuals who work in an environment with great diversity the perceptions can also be assumed to be diverse, which is a limitation upon the use of aggregating climate scores (James and Jones, 1979). This is an important aspect of this understanding of psychological climate, as it is the subjective and individual nature of the measure that is important as a mediating factor. It is not the measurement of the climate that is important within this inquiry, rather it is the *measurement of meaning* by the individual, and further the affective aspects such as hope, compassion and positive overall mood, rather than the cognitive concepts.

Boyatzis' (2008) positive emotional attractors (PEA)/ negative emotional attractors (NEA) survey is used as a tool to analyze climate. Boyatzis (2008) suggests that PEA and NEA are critical in affecting behavior through impact at a cognitive, emotional, social and physiological basis by influencing an individual on a cognitive, emotional, social and physiological basis. Within Boyatzis' (2008) P/NEA Scale, there are three sub-constructs that measure vision, compassion, and overall positive mood, which are offered as a measure of PPC.

Organizational citizenship behaviors/ participation

Organizational citizenship behaviors (OCB) are often equated with extra-role behaviors, outside of the immediate reward mechanism within an organization (Organ *et al.*, 2005) and contribute to effectiveness (Turnipseed and Vandewaa, 2012). Turnipseed and Vandewaa (2012) suggested that organizational citizenship behaviors may be the resulting affect from EI and found a relationship between EI and organizational citizenship behaviors. Specifically, self-rated high scores on EI significantly predicted OCB (Alfonso *et al.*, 2016). Further, evidence has been found of a direct correlation between extra-role behaviors and employee performance (Van Dyne and LePine, 1998). Therefore, it is important to understand the antecedents of organizational citizenship behaviors or the dimension that this study focuses on, participation. For the purpose of this study, participation is understood as participation in striving to improve performance, rather than general participation.

Model development and hypotheses

In this section, a model is developed with associated hypotheses, which guide understanding of the antecedents of SI, and the mediating affects of both PPC and RE upon PP.

The hypothesized model, shown in Figure 2, is based on the results of previous inquiries into the nature of physician leadership (Quinn and Perelli, 2016; Quinn, 2015). This study extends previous work to gain a better understanding of what factors influence participation and introduces social competencies as an antecedent. This model offers potential causal explanations for physician leadership PP moreover than has previously been explored.

RE was previously tested quantitatively as an important measure in understanding physician leadership (Quinn, 2015). Because of the fleeting nature of many physician leadership roles, as well as the strong identity physicians adopt when they are indoctrinated into the profession, self-identity is a vital component in how a physician leader understands and enacts their leadership role.

Direct effect hypotheses

The more the physician's role is endorsed by others, around him or her, the more participation in striving to improve leadership performance will be found. Therefore, it is hypothesized that:

H1. RE has a positive effect on PP for physicians.

Additionally, it follows that in the healthcare setting positive organizational climate will increase physician participation in striving to improved leadership performance. Studies suggest that perceived organizational support serves as a mediating factor to success (Cola and Wang, 2017). PPC has been found to be related to job involvement, as well as performance (Brown and Leigh, 1996), thus we postulate that:

H2a. PPC has a positive effect on PP for physicians.

H2b. PPC has a positive effect on RE for physicians.

Furthermore, a high degree of SI is predictive of an increase in participation for employees, in general, and it is not thought that this would differ for physicians in a healthcare leadership setting. Thus, it stands that:

H3a. SI have a positive effect on PP for physicians.

H3b. SI have a positive effect on RE for physicians.

Mediating effect hypotheses

Having previously tested vision and compassion sub-constructs of the P/NEA measure (Quinn, 2015), it is believed that PPC will also be an important mediator (i.e. a construct that is critical to the causal transfer of effects from a predictor to an outcome variable) within this model, and therefore, propose the following hypotheses.

H4a. RE positively mediates the positive effect of PPC on PP for physicians.
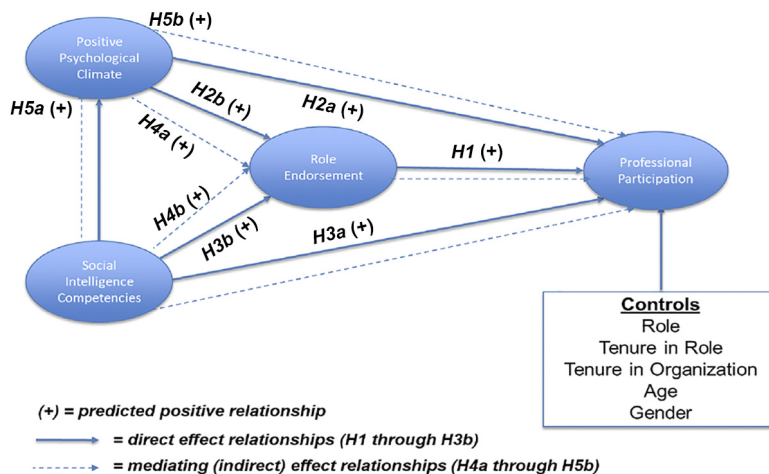
H4b. RE positively mediates the positive relationship between SI competencies and PP for physicians.

Based upon both the initial qualitative (Quinn and Perelli, 2016) and quantitative explorations (Quinn, 2015), two sub-constructs of the P/NEA were important mediators, which we now explore in this model as a complete construct, as we believe the P/NEA measure is representative of psychological climate. Because we found significance in this mediating relationship between RE and participation, we conjecture that PPC will mediate the antecedents in this model not only to participation but also to RE:

H5a. PPC positively mediates the effect of SI competencies on RE.

H5b. PPC positively mediates the relationship between SI competencies on PP.

Figure 2 Hypothesized model

(+) = predicted positive relationship

= direct effect relationships (H1 through H3b)

= mediating (indirect) effect relationships (H4a through H5b)

Research methods

To explore the direct, mediating and moderating effects of PPC and RE on physician PP in leadership, a survey-based deductive quantitative methodology was used to test hypotheses. Ringle *et al.* (2005) partial least squares modeling (PLS) has been successfully used for social science and business research (Hair *et al.*, 2014). If is often used when sample sizes are small, no assumptions of data distribution have been made or when there are formative constructs used in the structural model (Wong, 2013). It is for this latter reason (i.e. the use of formative constructs in the structural model) that PLS is used in this study. The two formative constructs in the model are SI and participation. Therefore, we are comfortable with using PLS as it represents the currently preferred tool used by researchers when one or more of those conditions above are present in a hypothesized model. An extensive number of journal articles have been published that use PLS modeling (Wong, 2013). However, prior to testing the hypotheses outlined herein, psychometric survey methodology that maps individual responses to the underlying concepts within the model was used (DeVellis, 2016).

Measurement of research variables

To ascertain and measure the relevant dimensions of the model, this process proceeded in five stages, namely, development, adoption and adaptation of measurement scales, development of the survey instrument, pretesting to assess reliability and validity of the survey instrument and data collection from a sample of physicians with membership in the American College of Physician Executives, the largest health care organization for physician executives in the USA.

Construct items were based upon previously validated measures where possible. Original items were developed based on a review of relevant literature and using a procedure consistent with prior studies (Churchill, 1979; Koufteros, 1999). All first-order constructs were specified with reflective indicators, except for participation. Participation is defined by five formative indicators adapted from the work of Van Dyne *et al.*'s measure of organizational citizenship behavior (1994). The final model examined three of these indicators. The SI competencies also contain formative indicators, as it is a reflective first order, formative second order construct (Jarvis, MacKenzie, and Podsakoff, 2003) as implemented previously by Boyatzis and Goleman (2007).

Construct development

Although most scale items were adapted from those in the existing literature with slight modifications to reflect the focus of this inquiry, a new scale was developed to measure RE.

Independent variable: Social intelligence competencies

SI is a second order formative construct with reflective first order dimensions of coaching and mentoring, empathy, influence, inspirational leadership, organizational awareness and teamwork. This measure has been adapted from Boyatzis and Goleman's (2007) ESCI, which is on a five-point Likert scale. Only the social competency constructs were selected for inclusion.

Mediating variables: Role endorsement and positive psychological climate

RE was informed by earlier work on physician leadership (Quinn and Perelli, 2016) and adapted from DeRue and Ashford (2010). Six items were developed on a five-point scale to measure the claiming and granting of leadership from an individual perspective, within peer relationships, as well as from an organizational perspective.

To measure PPC, the PNEA scale (Boyatzis, 2008) was used, which includes three subscales, namely, vision, compassion and overall positive mood. All 21 items were measured on a five-point scale with "strongly agree" and "strongly disagree" at the opposite ends.

Dependent variable: Participation

A multi-item construct of organizational citizenship behavior using participation as a major component was adapted for participation. Five items that measure participation were used, from the original 54 items in Van Dyne *et al.*'s (1994) measure for organizational citizenship behavior. These items were measured on a five-point scale ranging from "1-strongly disagree" to "5-strongly agree".

It is suggested here that this measure of participation is a measure of PP, which specifically considers extra-role behaviors and includes scale items such as "frequently makes innovative suggestions to coworkers;" "keeps well informed where opinion might benefit the organization," etc. These may, therefore, be more representative of a measure of extra role behaviors in striving to improve performance.

Controls

Several controls were included: role, tenure in role and in organization, age and gender. Rousseau and McLean Parks (1993) noted that employees who have long tenure in their organizations tend to have strong organizational ties, and it has been found that the confidence developed in a role leads to increased competence and feelings of organizational commitment (Salancik, 1977). Age and gender have also been used in numerous studies across disciplines to assess impact upon results, and these were included to ensure the accuracy of the data. A copy of the survey instrument is available from the authors.

Sample

The population sampled was the membership of the AAPL, which is the largest organization for physician executives in the USA. The AAPL is accredited by the Accreditation Council for Continuing Medical Education and has approximately 10,000 active members (across 40 countries) at any given time, including CEOs, chief medical officers, vice presidents of medical affairs and other physician leaders at all levels of organizations (2019).

Of the 9,083 contacts that received the email with the survey link, 8,672 emails were delivered, 2,148 were tracked as opened, 1,030 clicked on the link for the survey and 936 physicians started the survey. The response rate was 7.9 per cent, which is within the expected range for physicians, as physicians are a group with historically low response rates (Cunningham *et al.*, 2015). The sample was then reviewed for

missing values and the data was cleaned which resulted in a final sample size of 677.

The data was collected beginning in July 2011 with 547 males (81 per cent) and 128 females (19 per cent) responding, which is within expected ranges of the overall physician population in the USA (American Medical Association, 2011). A reminder e-mail was sent out two weeks after the initial e-mail went out to members. To derive the moderating variable used in this study, 420 respondents stated their leadership role as part-time and 222 as full-time, with the remaining responding with "not applicable." In total, 308 (46 per cent) of respondents stated their age as 55 or older and, of that age group, 240 reported their role as full-time. The AMA delegates reported 79.4 per cent as male and 20.6 per cent as female and 77.3 per cent as over age 50 as of December 2010 (Association, 2011), therefore, the sample is objectively representative of the population of physicians in leadership. The difference in the age brackets may account for the significant increase in those over 50, as opposed to those over 55.

Measurement and instrument development

In developing the survey instrument, a list of itemized questions was sent to ten respondents, including several physician leaders, and they were asked to comment on the flow, clarity, timing and the level of respondent interest through completion rate. Following the pre-test, some items were modified to ensure additional precision. The pre-test was then followed by asking three individuals to read the questions aloud and answer them to assess cognitive difficulties presented by the survey items (Bolton, 1993). Based upon this feedback one additional item was adjusted for clarification.

An online pilot survey was then conducted with 65 physicians working in four hospitals within a single healthcare organization, and an exploratory factor analysis (EFA) was performed for each hypothesized construct within the model. The items were found to meet adequacy thresholds for factoring within each construct and no further adjustments were made following this step.

Data screening

Prior to the analysis, missing values were removed related to the latent constructs. The data was screened for linearity, normality, multicollinearity, skewness and outliers and found adequate for analysis. From the surveys completed, six respondent data points were dropped due to missing values. There were no significant outliers, as primarily Likert scales were used within the survey.

Statistical analysis

The research model was tested using PLS. An assumption for a covariance based SEM analysis is that the items used to measure a latent variable are reflective (Chin, 2001). "As PLS explicitly estimates the outer weights to form construct scores, modeling formative indicators is much less problematic" (Chin, 2010, p. 664). Jarvis, MacKenzie, and Podsakoff (2003) provide a set of four decision rules based on:

- direction of causality based on conceptual definitions;
- interchangeability of the indicators;
- co-variation among the indicators; and
- nomological network of the indicators.

Taken together, these rules can suggest either a reflective or formative model formulation. It was found that participation is formative in nature, which was in line with the previous study exploring this construct (Quinn, 2015). In addition, this model contains a second order formative construct (SI competencies); therefore, PLS-Graph was found to be a suitable technique to analyze the model.

Measurement model

Exploratory factor analysis (reflective constructs only)

EFA was conducted using principal axis factoring and PROMAX rotation. Sample size was adequate with 677 usable responses across 59 items. Predicted adequate range being 590 per Hair *et al.* (2010). The Kaiser–Meyer–Olkin (KMO) value was 0.959 and the Barlett's Test of Sphericity was significant (χ^2 = 12,678.255, df = 325 and $p < 0.000$), indicating sufficient intercorrelations for factors to emerge. The constructs explained a little over 55 per cent of the variance within the data. A four-factor solution emerged with insignificant cross loadings (<0.2). This is summarized in Table I below. All items were retained and included in the confirmatory factor analysis (CFA).

Confirmatory factor analysis

To assess the psychometric properties of the latent constructs, a PLS measurement CFA model was created. To assess convergent and discriminant validity, composite reliability

Table I EFA Measurement model: reflective constructs

Construct	No. of items	Loadings	Cronbach's alpha
SI competencies *	30		
Empathy	5	0.6289, 0.7542, 0.6867, 0.6698, 0.6009	0.690
Organizational awareness	5	0.7215, 0.7196, 0.7691, 0.7571, 0.7660	0.801
Inspirational leadership	5	0.7548, 0.7666, 0.8045, 0.6879, 0.7059	0.797
Coaching/Mentoring	5	0.6255, 0.8074, 0.7292, 0.6651, 0.8079	0.780
Influence	5	0.7402, 0.6798, 0.6791, 0.6529, 0.5030	0.669
Teamwork	5	0.7407, 0.6892, 0.7936, 0.8172, 0.7140	0.806
RE	6	0.6420, 0.7287, 0.8576, 0.7631, 0.8509, 0.8153	0.869
PPC	21	0.6204, 0.5384, 0.5884, 0.6678, 0.4955, 0.7352, 0.8840, 0.8446, 0.8365, 0.8229, 0.7727, 0.8385, 0.6472, 0.7020, 0.7366, 0.7607, 0.7272, 0.7861, 0.7407, 0.7489	0.953

Notes: *SI competencies is a second order formative construct. The first order reflective constructs are listed below

(CR), the average variance extracted (AVE) and the maximum shared variance (MSV) and the item factor loadings for the reflective constructs were assessed.

Estimation of internal consistency

The survey used multi-item scales to measure the reflective first-order factors. The measurement properties for the reflective constructs were examined by conducting CFA using PLS. To assess the internal consistency of the reflective factors, the AVEs, coefficient alpha and CR measures were examined. Validity and reliability were not assessed for either of the formative constructs, as the very nature of formative measurement renders irrelevant traditional assessments of convergent validity and item reliability.

The composite reliabilities for all reflective measures were high, ranging from 0.788 to 0.932. A 0.70 threshold is a tolerable reliability according to Fraenkel and Wallen (1996). All reflective construct coefficients were above 0.788 showing strong reliability. Correlation matrix presented below as Table II.

Tests were conducted to evaluate the convergent and discriminant validity and the reliability of reflective measures. Convergent validity of the constructs is assessed by examining the constructs factor loadings, composite scale reliability and AVE (Chin and Frye, 1998; Fornell and Larcker, 1981). Loadings in excess of 0.70 on their respective factors are interpreted to indicate convergent validity (Straub *et al.*, 2004). A second indicator of convergence was also used. Here, a value above 0.50 for the AVE for each construct is assumed to indicate sufficient convergence. As seen in Table II, results indicate that both of these conditions have been met. Discriminant validity is demonstrated when the square root of the AVE is greater than the correlations between constructs (Bollen, 1989) and greater than the MSV.

The square root of AVEs ranged from 0.656 to 0.780 for reflective constructs. For a second test of discriminant validity, individual items may be assumed to possess sufficient discriminant validity if they load higher on their own respective construct than on any other latent variable (Gefen, Straub and Boudreau, 2000; Straub *et al.*, 2004). This was true for all items. Based on both tests, the measures possess sufficient discriminant validity. Consequently, evidence for internal

consistency and the scales reliability were provided by these results.

Common method bias

As the data was collected from a single source, the possibility of common method bias cannot be eliminated. To test for common method bias, Harman's one-factor test was applied; including all items in the model in a principle components factor analysis (Podsakoff *et al.*, 2003). Based upon Eigenvalues greater than 1, four factors emerged, which explained over 65 per cent of the variance; therefore, it appears that there is no common method bias. Correlations among the latent factors were examined to see if any of the values exceeds 0.90 (Lowry *et al.*, 2009, p. 178). Correlations above 0.90 are indicative of a common method bias problem (Pavlou *et al.*, 2007). No correlations were found to be near the 0.90 level, which suggests no statistical evidence of significant common method bias.

Structural model

PLS, a structural equation modeling (SEM) technique, for testing the research model was used. PLS is a regression-based technique with roots in path analysis (Fornell and Larcker, 1981); however, it has emerged as a powerful approach to studying causal models involving multiple constructs with multiple indicators. This approach facilitates testing of the measurement model and the structural model simultaneously. The measurement model revalidated the instrument and determined how each manifest variable loaded on the construct that it measured. The structural model was estimated using the PLS algorithm with bootstrapping (1,000 resamples).

The test of the structural model includes estimating the path coefficients and the R^2 values. The path coefficients, which indicate the strength and direction of the relationships among the variables, should be significant and directionally consistent with expectations. The R^2, which represents the proportion of variance in the endogenous variables that can be explained by the antecedents, demonstrates the predictive power of the model. Collectively, R^2 and path coefficients indicate how well the model fits the empirical data. To assess whether the direct effects were significant, bootstrap resampling was performed.

Table II Correlations and reliability and validity of constructs

Construct	CR	AVE									
RE	0.902	0.608	1								
(2) SI	0.932	0.317	0.422	1							
(1) Empathy	0.802	0.449	0.267	0.791	1						
(1) Organizational awareness	0.863	0.558	0.384	0.767	0.549	1					
(1) Inspirational leadership	0.862	0.555	0.368	0.814	0.541	0.497	1				
(1) Coach/mentoring	0.850	0.534	0.35	0.787	0.522	0.511	0.618	1			
(1) Influence	0.788	0.430	0.293	0.731	0.554	0.528	0.529	0.465	1		
Teamwork	0.867	0.566	0.306	0.807	0.606	0.511	0.592	0.553	0.479	1	
PPC	0.958	0.535	0.676	0.359	0.241	0.358	0.288	0.246	0.245	0.297	1
Participation *		0.36	0.463	0.316	0.345	0.406	0.383	0.345	0.372	0.286	

Notes: *Participation is a formative construct. (2) Signifies the second order formative dimension. (1) signifies the first order reflective dimensions in the underlying formative construct of SI

A series of tests were run to investigate the predictive power of the structural model. The model was tested for the change in R^2, to determine the substantive impact of each independent variable upon the dependent variables. To do so, f^2 was calculated in the following manner:

$$f^2 = \frac{R^2 included - R^2 excluded}{1 - R^2 included}$$

R^2 represents the amount of variance in the construct that is explained by the model. Cohen (1988) recommends values of 0.02, 0.15 and 0.35 to denote small, medium or large effects at the structural level. The causal four-steps method developed by Baron and Kenny (1986) was used to test for mediation effects, presented in Table III. Analysis of the structural model revealed four mediated relationships where a significant independent variable (IV) – dependent variable (DV) relationship was mediated.

Findings

Table III reports the direct effect results, the R^2 values and effect size of each relationship. All effects are within the appropriate range (Cohen, 1988). The hypothesized structural model was tested in PLS and the results showed four out of five positive direct relationships between constructs.

The final results model, shown in Figure 3, shows the relationships and significant paths between constructs, as well as the R^2 values for each construct.

The direct effect results of testing the structural model provide evidence to *support H1*, RE ($\beta = 0.215$, $p < 0.001$) has a significant and positive relationship with PP. However, there is *not support for H2a* because PPC ($\beta = 0.005$, NS) does not have a significant positive relationship with PP, but *H2b is supported* as PPC has a significant and positive relationship with RE ($\beta = 0.598$, $p < 0.001$). Evidence is also provided to *support H3a and H3b* because SI have a significant and positive relationship on PP ($\beta = 0.374$, $p < 0.001$) and on RE ($\beta = 0.496$, $p < 0.001$), respectively.

The mediating results from testing the structural model are summarized in Table IV and provide evidence in *support H4a* because RE fully mediates the positive relationship between PPC and PP. Even though there was no direct relationship between PPC and PP (see *H2a* above) there is a strong indirect effect when RE is added to the model, thus strengthening the original hypotheses regarding the importance of RE on these factors for physicians. Furthermore, *H4b is supported* as RE mediates the positive relationship between SI competencies and PP ($\beta = 0.374$, $p < 0.001$ direct effect); indicating partial mediation.

Additional mediation results from testing the structural model provide evidence in *support H5a* because PPC partially mediates the relationship between SI competencies and RE. This is as predicted, and the level of significance is high with some strong effect sizes. Finally, *H5b is not supported* as PPC does not mediate the positive relationship between SI competencies and PP (Table IV).

Table III Direct effect results, R^2 values and effect sizes

Hypotheses	Hypothesized relationship	β	R^2	t-statistic	f^2	Effect size
H1 – Supported	RE → Participation	0.215***	0.256	4.7874	0.0511	Small
H2a – Not Supported	PPC → Participation	0.005(NS)	0.256	2.1379	0.0434	Small
H2b – Supported	PPC → RE	0.598***	0.496	9.0052	0.1465	Small
H3a – Supported	Social competencies → Participation	0.374***	0.256	20.5924	0.5833	Large
H3b – Supported	Social competencies → RE	0.496***	0.496	6.5397	0.0714	Small

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$, NS = Non-significant.
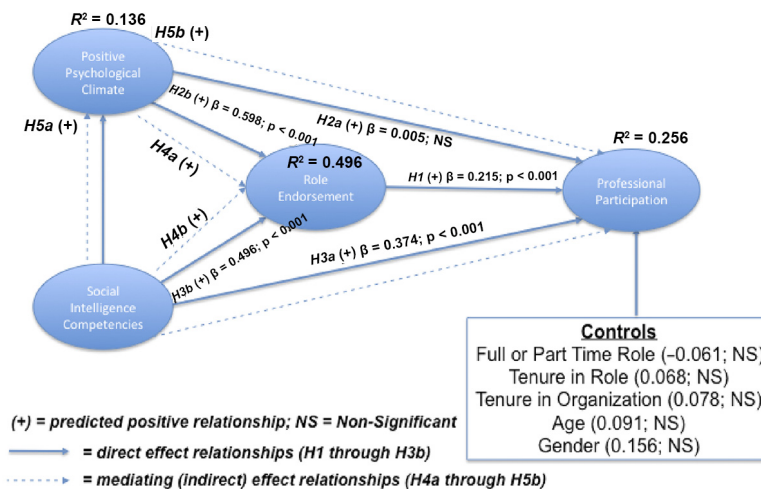
Figure 3 Structural model direct effect results

Table IV Mediating effects of RE and PPC

Mediated path	Path coefficient	T-statistic	Std. error	Effect size
H4a: PPC → PART	0.0050NS	0.1076	0.0465	Small
PPC→RE	0.5980***	20.5924	0.0290	
RE → PART	0.2150***	4.7874	0.0449	
Full mediation				
H4b: SC → PART	0.3740***	9.0052	0.0415	Small
SC → RE	0.2120***	6.5397	0.0324	
RE → PART	0.2150***	4.7874	0.0449	
Partial mediation				
H5a: SC → RE	0.2120***	6.5397	0.0324	Large
SC → PPC	0.3690***	22.2166	0.0318	
PPC → RE	0.5980***	20.5924	0.0290	
Partial mediation				
H5b: SC → PART	0.3740***	9.0052	0.0415	Small
SC → PPC	0.3690***	22.2166	0.0318	
PPC → PART	0.0050NS	0.1076	0.0465	
No mediation				

Notes: $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$, NS = Non-significant

None of the control variables were significantly related to the dependent variable of PP (Figure 3). Previous evidence had suggested that the variable of tenure in role and in organization along with gender and age would be relevant to the PP construct in this context. Additionally, earlier research by Quinn and Perelli, 2016 indicated that there would likely be some relationship between physician identity and either a full or part-time physician role. This was not the case with these data. However, the later was tested on an *ad hoc* basis using multi-group moderation. See results of *ad hoc* testing reported later the findings section.

Ad hoc testing

In a qualitative precursor to this quantitative study, Quinn and Perelli (2016) indicated that working full or part-time in a leadership versus a physician role influenced physician role identity. However, there was no effect on full or part-time role when regressed as a control to PP in this study. This was somewhat surprising, so the data sample was split between full and part-time role and multi-group moderation was performed using PLS to further investigate these particular role characteristics. Therefore, this *ad hoc* moderation test examined if part-time physician leaders would have less RE, which, in turn, would dampen the effect on PP compared to stronger effects for full-time physician leaders. No significant moderation effects were found between these two-group confirming the control data in this study, but this remains in contrast to the earlier qualitative study.

Discussion

This study showed a pattern of outcome data consistent with the mediating hypotheses that the effect of social competencies on participation is mediated by RE and psychological climate. The double mediation with PPC and RE found in this model warrants a higher level of meaning be placed upon the cultivation of positive relationships. Positive relationships support the individual in acceptance of a second identity as a leader, leading therefore to a higher level of PP. These findings also may be important in understanding how healthcare leaders can increase the effectiveness of their physician leaders. A higher level of commitment to a leadership role will likely increase a physician leader's performance (Cola, 2019). Establishing the importance of a social identity group of physicians as leaders and developing a complete medical staff vision based on values the physicians hold in common (O'Connor and Fiol, 2006) may assist physicians in determining the importance of physician leadership.

By highlighting in-group similarities between physicians involved in leadership, healthcare organizations have an opportunity to create a new social identity group for physician leaders. This will strengthen their own acceptance of their leadership identity, as well as begin to influence how other physicians view leaders within the organization. Instead of an "us" versus "them" perspective with regard to administration and leadership, physicians will then begin to embrace the importance of physician leadership as it relates to their identity. This must be augmented by the emphasis upon quality of care through innovation and effectiveness. With the common goal of increasing effectiveness as leaders by ongoing innovation, as well as the improvement of patient care, physician leaders can find connections in those ideals they hold similar.

Limitations

Self-reported data, despite their limitations, are indispensable when there is no alternative source of essential data. However, an important consideration of these results is that we are interested in the subjective nature of the concepts from the perspective of the individual; therefore, this was the appropriate method of collection for this study. Our ability to generalize to other types of professionals is limited to this group studied. A broader understanding of physician leadership may benefit from a more comprehensive collection procedure, including one in which data is collected in a 360-degree format, which will allow for a construction of organizational climate. A comparative analysis could be performed where the agreement or divergence between psychological climate and organizational climate and the mediating affects could be studied.

While great strides were taken to protect the results from common methods bias, no statistical test can guarantee such bias does not exist within the results (Podsakoff *et al.*, 2003). If possible, an evenly distributed sample by role would have been favorable, which may have led to further insight. Finally, the dependent variable, participation, could have been measured on a different scale rather a psychometric scale, which may have affected the results.

Implications for practice and future research

While our findings are limited, this is the first study to confirm the mediating relationship of RE upon the PP of physician leaders. Taken as a follow up exploration into physician leadership, which examined RE as an antecedent (Quinn, 2015), we find not only strength in this construct as mediator but also find significance in the double mediation occurring through PPC and RE.

Interestingly, this inquiry found no significant differences related to part or full-time status; however, this model provided a more robust analysis with two mediators and found that the presence of RE had mediating effects on PP or Organizational Citizenship behaviors in relation to PPC and SI competencies. The increased importance of the social competencies upon RE is not surprising, as physician leaders who have a greater understanding of relationship management would be expected to be better positioned to accept a secondary identity of leader. Due to the nature of their leadership role being their primary focus, these physicians who understand the organizational importance of roles seem to have more constant and ongoing interaction with others within the organization. In testing this model, the focus was on the linear relationships associated with the intervening effects; however, additional moderating relationships could be incorporated into future explorations involving these constructs.

Based upon our findings and the importance of supporting physicians in their leadership development, we are actively advocating for physician leadership training and development at all levels of medical education. We have recently published a textbook on physician leadership aimed at providing a resource for physician leadership in medical education across the continuum, from undergraduate medical education through continuing education for practicing physicians.

While this study looked at climate as a factor, another important measure to consider is organizational culture. While associations can be drawn between the two based in the relationship that both have to do with shared meaning, culture is an important, although not well-understood, aspect of organizational impact upon the individual that should be studied further and specifically studied within the context of healthcare, with a focus on physicians and their leadership roles.

There are several areas for future study, which should be of particular importance to healthcare leaders as they focus on the development of physician leaders. One is the age at which a physician begins to take on leadership roles. This research found that the majority of physician leaders, even part-time and temporary leaders, are over 55 years of age. What are the implications of this for the future of physician leadership when physicians only opt into leadership roles later in their career? Also, there is a need to better understand the impact of physician leadership development efforts. While several leadership development courses and curricula are popping up in medical education (Quinn and White, 2019), there is still limited information about the impact of these programs and a need for further study on the impact upon the development and professionalization of physician leaders.

As the Association of American Medical Colleges and Accreditation Council for Graduate Medical Education have made great strides in addressing the importance of emotional and social competencies in establishing core competencies and what they have termed Entrustable Professional Activities, which are behaviors that can observed and measured to denote competence in their profession by residents, there is still great progress that needs to be made at the level of both undergraduate and graduate medical education.

Societally, we feel that there needs to be a shift in understanding of the role of the physician. While physicians have always led hospitals to some degree, the numbers have waned significantly from the mid to late twentieth century, as management science pervaded all industries without enough consideration of the context as professional leadership was implemented across healthcare. One size does not fit all in organizational development, just as leadership development is not one size fits all. There needs to be a focus on understanding not only the nature of physician leadership with its uniqueness but also understand how to support physicians in their own leadership development and adoption of their identity as not only a physician but as a leader both formally and informally.

We hope that this and future explorations will lead to an increased focus on understanding the nature of physician leadership and additional resources put forth for leadership training and development for physicians. We feel it is important to understand the factors that are influencing physician leaders throughout this process and to ensure that they are provided proper support in developing their own identify as a physician leader and encourage practitioners to focus on the scholarly explorations that may favorably influence their organizational development efforts in this area.

References

Ackerly, D.C., Sangvai, D.G., Udayakumar, K., Shah, B.R., Kalman, N.S., Cho, A.H., Schulman, K.A., Fulkerson, W. J., Jr. and Dzau, V.J. (2011), "Training the next generation of physician–executives: an innovative residency pathway in management and leadership", *Academic Medicine*, Vol. 86 No. 5, pp. 575-579.

Alfonso, L., Zenasni, F., Hodzic, S. and Ripoll, P. (2016), "Understanding the mediating role of quality of work life on the relationship between emotional intelligence and organizational citizenship behaviors", *Psychological Reports*, Vol. 118 No. 1, pp. 107-127.

American Medical Association (2011), "AMA adopts new policies at annual meeting".

Andrei, F., Siegling, A.B., Aloe, A.M., Baldaro, B. and Petrides, K.V. (2016), "The incremental validity of the trait emotional intelligence questionnaire (TEIQue): a systematic review and meta-analysis", *Journal of Personality Assessment*, Vol. 98 No. 3, pp. 261-276.

Ashforth, B.E. and Mael, F. (1989), "Social identity theory and the organization", *The Academy of Management Review*, Vol. 14 No. 1, pp. 20-39.

Ashkanasy, N.M. and Daus, C.S. (2005), "Rumors of the death of emotional intelligence in organizational behavior are vastly exaggerated", *Journal of Organizational Behavior*, Vol. 26 No. 4, pp. 441-452.

Baron, R.M. and Kenny, D.A. (1986), "The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations", *Journal of Personality and Social Psychology*, Vol. 51 No. 6, p. 1173.

Bar-On, R. (2004), *Emotional Quotient Inventory: A Measure of Emotional Intelligence*, Technical Manual, Multi-Health Systems, Toronto.

Bar-On, R. (2006), "The Bar-On model of emotional-social intelligence, ESI", *Psicothema*, Vol. 18, pp. 13-25.

Blumenthal, D.M., Bernard, K., Bohnen, J. and Bohmer, R. (2012), "Addressing the leadership gap in medicine:

residents' need for systematic leadership development training", *Academic Medicine*, Vol. 87 No. 4, pp. 513-522.

Bollen, K.A. (1989), *Structural Equations with Latent Variables*, John Wiley, New York, NY.

Bolton, R.N. (1993), "Pretesting questionnaires: content analyses of respondents' concurrent verbal protocols", *Marketing Science*, Vol. 12 No. 3, pp. 280-303.

Boyatzis, R. (2009), "Competencies as a behavioral approach to emotional intelligence", *Journal of Management Development*, Vol. 28 No. 9, pp. 749-770.

Boyatzis, R. and Goleman, D. (2007), *Emotional and Social Competency Inventory University Edition Workbook*, HayGroup, Boston, MA.

Brown, S.P. and Leigh, T.W. (1996), "A new look at psychological climate and its relationship to job involvement, effort, and performance", *Journal of Applied Psychology*, Vol. 81 No. 4, p. 358.

Burke, P.J. and Reitzes, D.C. (1991), "An identity theory approach to commitment", *Social Psychology Quarterly*, Vol. 54 No. 3, pp. 239-251.

Chaudry, J., Jain, A., McKenzie, S. and Schwartz, R.W. (2008), "Physician leadership: the competencies of change", *Journal of Surgical Education*, Vol. 65 No. 3, pp. 213-220.

Cherniss, C. (2010), "Emotional intelligence: new insights and further clarifications", *Industrial and Organizational Psychology*, Vol. 3 No. 2, pp. 183-191.

Chin, W.W. and Frye, T. (1998), "PLS-graph (version 2.91. 03.04)[computer software]", University of Calgary, Calgary.

Churchill, G.A. Jr. (1979), "A paradigm for developing better measures of marketing constructs", *Journal of Marketing Research*, Vol. 16 No. 1, pp. 64-73.

Cohen, J. (1988), *Statistical Power Analysis for the Behavioral Sciences*, L., Lawrence Earlbaum Associates, Hillsdale, NJ.

Cola, P.A. (2019), "Chapter 2: from physician to physician leadership", in Quinn, J.F. and White, B.A. (Eds), *Cultivating Leadership in Medicine*, Kendall Hunt, Dubuque, IA.

Cola, P.A. and Wang, Y. (2017), *Discovering Factors That Influence Physician Scientist Success in Academic Medical Centers*, Academy of Management Proceedings, Academy of Management Briarcliff Manor, New York, NY.

Cunningham, C.T., Quan, H., Hemmelgarn, B., Noseworthy, T., Beck, C.A., Dixon, E., Samuel, S., Ghali, W.A., Sykes, L.L. and Jetté, N. (2015), "Exploring physician specialist response rates to web-based surveys", *BMC Medical Research Methodology*, Vol. 15 No. 1, p. 32.

DeRue, D.S. and Ashford, S.J. (2010), "Who will lead and who will follow? A social process of leadership identity construction in organizations", *Academy of Management Review*, Vol. 35 No. 4, pp. 627-647.

DeVellis, R.F. (2016), *Scale Development: Theory and Applications*, Sage Publications.

Fornell, C. and Larcker, D.F. (1981), "Structural equation models with unobservable variables and measurement error: Algebra and statistics", *Journal of Marketing Research*, Vol. 18 No. 3, pp. 382-388.

Fraenkel, J. and Wallen, N. (1996), *Valididity and Reliability. How to Design and Research in Education*, Vol. 3, McGraw-Hill, New York, NY, pp. 153-171.

Gefen, D., Straub, D. and Boudreau, M.C. (2000), "Structural equation modeling and regression: guidelines for research practice", *Communications of the Association for Information Systems*, Vol. 4 No. 1, p. 7.

Goffman, E. (1963), *Stigma: Notes on a Spoiled Identity*, JH & Carpenter, Jenkins.

Gunderman, R. and Kanter, S.L. (2009), "Perspective: educating physicians to lead hospitals", *Academic Medicine*, Vol. 84 No. 10, pp. 1348-1351.

Hair, J.F., Jr., Black, W.C., Babin, B.J. and Anderson, R.E. (2010), *Multivariate Data Analysis*, Pearson Prentice Hall, NJ.

Hair, J.F., Jr., Sarstedt, M., Hopkins, L. and G. Kuppelwieser, V. (2014), "Partial least squares structural equation modeling (PLS-SEM) an emerging tool in business research", *European Business Review*, Vol. 26 No. 2, pp. 106-121.

Hall, S. (2005), "The rediscovery of 'ideology': Return of the repressed in media studies", *Culture, Society and the Media*, Routledge, pp. 61-95.

Hogg, M.A. (2001), "A social identity theory of leadership", *Personality and Social Psychology Review*, Vol. 5 No. 3, p. 184.

Hogg, M.A., Terry, D.J. and White, K.M. (1995), "A tale of two theories: a critical comparison of identity theory with social identity theory", *Social Psychology Quarterly*, Vol. 58 No. 4, pp. 255-269.

Hogg, M.A. and Turner, J.C. (1985), "Interpersonal attraction, social identification and psychological group formation", *European Journal of Social Psychology*, Vol. 15 No. 1, pp. 51-66.

Hopkins, M.M., O'Neil, D.A. and Stoller, J.K. (2015), "Distinguishing competencies of effective physician leaders", *Journal of Management Development*, Vol. 34 No. 5, pp. 566-584.

Insel, P.M. and Moos, R.H. (1974), "Psychological environments: expanding the scope of human ecology", *American Psychologist*, Vol. 29 No. 3, p. 179.

James, L.R., Choi, C.C., Ko, C.H.E., McNeil, P.K., Minton, M.K., Wright, M.A. and Kim, K.I. (2008), "Organizational and psychological climate: a review of theory and research", *European Journal of Work and Organizational Psychology*, Vol. 17 No. 1, pp. 5-32.

James, L.A. and James, L.R. (1989), "Integrating work environment perceptions: explorations into the measurement of meaning", *Journal of Applied Psychology*, Vol. 74 No. 5, p. 739.

James, L.R. and Jones, A.P. (1974), "Organizational climate: a review of theory and research", *Psychological Bulletin*, Vol. 81 No. 12, p. 1096.

Jarvis, C.B., MacKenzie, S.B. and Podsakoff, P.M. (2003), "A critical review of construct indicators and measurement model misspecification in marketing and consumer research", *Journal of Consumer Research*, Vol. 30 No. 2, pp. 199-218.

Koufteros, X.A. (1999), "Testing a model of pull production: a paradigm for manufacturing research using structural equation modeling", *Journal of Operations Management*, Vol. 17 No. 4, pp. 467-488.

Locke, E.A. (1976), "The nature and causes of job satisfaction", *Handbook of Industrial and Organizational Psychology*.

Lowry, P.B., Romano, N.C., Jenkins, J.L. and Guthrie, R.W. (2009), "The CMC interactivity model: how interactivity enhances communication quality and process satisfaction in lean-media groups", *Journal of Management Information Systems*, Vol. 26 No. 1, pp. 155-196.

Miao, C., Humphrey, R.H. and Qian, S. (2016), "Leader emotional intelligence and subordinate job satisfaction: a Meta-analysis of main, mediator, and moderator effects", *Personality and Individual Differences*, Vol. 102, pp. 13-24.

Montgomery, K. (2001), "Physician executives: the evolution and impact of a hybrid profession", *Advances in Health Care Management*, Emerald Group Publishing Limited, pp. 215-241.

O'Connor, E.J. and Fiol, C.M. (2006), "Creating readiness and involvement", *Physician Executive*, Vol. 32 No. 1, pp. 72-74.

Organ, D.W., Podsakoff, P.M. and MacKenzie, S.B. (2005), *Organizational Citizenship Behavior: Its Nature, Antecedents, and Consequences*, Sage Publications.

Pavlou, P.A., Liang, H. and Xue, Y. (2007), "Understanding and mitigating uncertainty in online exchange relationships: a principal-agent perspective", *MIS Quarterly*, pp. 105-136.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903.

Quinn, J.F. (2015), "The affect of vision and compassion upon role factors in physician leadership", *Frontiers in Psychology*, Vol. 6, p. 442.

Quinn, J.F. and Perelli, S. (2016), "First and foremost, physicians: the clinical versus leadership identities of physician leaders", *Journal of Health Organization and Management*, Vol. 30 No. 4, pp. 711-728.

Quinn, J.F. and White, B.A. (2019), *Cultivating Leadership in Medicine*, Kendall Hunt, Dubuque, IA.

Reinertsen, J.L. (1998), "Physicians as leaders in the improvement of health care systems", *Annals of Internal Medicine*, Vol. 128 No. 10, pp. 833-838.

Rousseau, D.M. and McLean Parks, J. (1993), "The contracts of individuals and organizations", *Research in Organizational Behavior*, Vol. 15, pp. 1-1.

Salancik, G.R. (1977), "Commitment and the control of organizational behavior and belief", *New Directions in Organizational Behavior*, Vol. 1, p. 54.

Stogdill, R. (1948), "Personal factors associated with leadership: a survey of the literature", *Journal of Psychology*, Vol. 24, pp. 35-71.

Straub, D., Boudreau, M.C. and Gefen, D. (2004), "Validation guidelines for is positivist research", *Communications of the Association for Information Systems*, Vol. 13 No. 1, p. 24.

Stryker, S. (1968), "Identity salience and role performance: the relevance of symbolic interaction theory for family research", *Journal of Marriage and the Family*, Vol. 30 No. 4, pp. 558-564.

Tajfel, H. and Turner, J.C. (1985), "The social identity theory of intergroup behavior", in Worchel S. and Austin, W.G. (Eds), *Psychology of Intergroup Relations*, Nelson-Hall, Chicago, pp. 7-24.

Tasi, M.C., Keswani, A. and Bozic, K.J. (2019), "Does physician leadership affect hospital quality, operational efficiency, and financial performance?", *Health Care Management Review*, Vol. 44 No. 3, pp. 256-262.

Turnipseed, D.L. and Vandewaa, E.A. (2012), "Relationship between emotional intelligence and organizational citizenship behavior", *Psychological Reports*, Vol. 110 No. 3, pp. 899-914.

Van Dyne, L., Graham, J.W. and Dienesch, R.M. (1994), "Organizational citizenship behavior: construct redefinition, measurement, and validation", *Academy of Management Journal*, Vol. 37 No. 4, pp. 765-802.

Van Dyne, L. and LePine, J.A. (1998), "Helping and voice extra-role behaviors: evidence of construct and predictive validity", *Academy of Management Journal*, Vol. 41 No. 1, pp. 108-119.

Van Rooy, D.L. and Viswesvaran, C. (2004), "Emotional intelligence: a Meta-analytic investigation of predictive validity and nomological net", *Journal of Vocational Behavior*, Vol. 65 No. 1, pp. 71-95.

Weiner, B.J., Shortell, S.M. and Alexander, J. (1997), "Promoting clinical involvement in hospital quality improvement efforts: the effects of top management, board, and physician leadership", *Health Services Research*, Vol. 32 No. 4, p. 491.

Wong, K.K.K. (2013), "Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS", *Marketing Bulletin*, Vol. 24 No. 1, pp. 1-32.

Further reading

AAPL (2019), "American Association of Physician Leadership", available at: www.physicianleaders.org/about (accessed 13 January 2019).

Ringle, C.M., Wende, S. and Will, A. (2010), "Finite mixture partial least squares analysis: Methodology and numerical examples", *Handbook of Partial Least Squares*, Springer, Berlin, Heidelberg, pp. 195-218.

Corresponding author

Joann Farrell Quinn can be contacted at: joannq@usf.edu

For instructions on how to order reprints of this article, please visit our website:
www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: **permissions@emeraldinsight.com**