A 25-year perspective on levels of analysis in leadership research

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A B S T R A C T

The purpose of this article is to present a comprehensive 25-year review of the incorporation of levels of analysis into conceptual and empirical leadership research published within Leadership Quarterly throughout its history. We assessed the population of Leadership Quarterly’s research (790 research articles) on four key levels of analysis-based issues: (1) explicit statement of the focal level(s) of analysis; (2) appropriate measurement given level of constructs; (3) use of a multi-level data analysis technique; and, (4) alignment of theory and data. Prior reviews regarding levels of analysis incorporation into leadership research have been limited to major research domains. Results revealed that while both conceptual and empirical articles only explicitly state the focal level of analysis in approximately one-third of the articles, appropriate levels-based measurement and alignment between theory and data are relatively strong areas of achievement for the articles within Leadership Quarterly. Multi-level data analysis techniques are used in less than one-fifth of all articles. Although there is room for improvement, there is evidence that Leadership Quarterly is a premier outlet for levels-based leadership research. Given the increasing complexity of organizational science with regard to groups, teams and collectives, Leadership Quarterly has an opportunity to model for organizational research on how to build and test complicated multi-level theories and models.

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1. Introduction

With more than 800 leadership manuscripts published within the annals of the Leadership Quarterly (LQ) over the past 25 years, arguably the largest repository of scholarly leadership research lies within the pages of LQ. As a fledgling journal, the first issue contained the mission of LQ, stated by Bernard Bass (1990), the founding editor:

"In the years to come, we see the Leadership Quarterly playing a signal role in bringing together diverse scholarship and practice to help better understand and improve the leader’s performance and the effectiveness of the individuals, groups, organizations, and societies for which the leader officer, manager, or administrator is responsible“ (Bass, 1990, p. v).

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While not explicitly using the term “levels of analysis,” Bass (1990) tacitly acknowledged the importance and centrality of a variety of levels of analysis in leadership research by including these levels in the mission of the journal. Coincidentally, just a few years prior to that first issue of LQ, organizational scholars Dansereau, Alutto, and Yammarino (1984) addressed growing concerns regarding levels of analysis issues in organizational research (Boulding, 1980; Cummings, 1981; Katz & Kahn, 1978; Miller, 1978; Roberts, Hulin, & Rousseau, 1978; Staw, 1980; Staw & Oldham, 1978; Van de Ven & Astley, 1981). Their book introduced a new paradigm for multi-level research, and was a response to concerns that a) theoretical formulations were lacking a clear conceptualization of levels of analysis, therefore limiting the logical basis for theory testing (Roberts et al., 1978) and b) statistical level of analysis issues in data analysis were seemingly viewed as distinct from theory development. The paradigm introduced by Dansereau colleagues (1984) offered a comprehensive, integrated framework for theorizing, measuring, testing and drawing inferences regarding organizational variables and the relevant entities upon which they are based. Thus, their approach addressed both aforementioned concerns regarding poor levels specification in theory, as well as the flawed view of independence between theory and data analysis.

While the Dansereau et al. (1984) framework represented the most comprehensive view of levels of analysis to date in organizational research, more importantly for leadership research was their use of leadership theory to present and discuss their new “variant approach.” Moreover, Dansereau colleagues (1984) fledging approach to organizational research would intersect dramatically with the leadership field’s fledging journal, Leadership Quarterly, and set both on a 25-year odyssey that would see continued and sustained intersection through the years.

Most notably, of the hundreds of leadership scholars that have served on LQ’s editorial board over the years, there are a handful of scholars that have served uninterrupted – their service to the journal has spanned the entire 25 years. Besides being a remarkable achievement and an exemplar of service to the field of leadership, within this esteemed group of “lifers” are three board members who have significantly contributed to another field related to, but separate from leadership: levels of analysis in organizational research. Along with being notable leadership scholars, LQ editorial board “lifers” Fred Dansereau, Chester Schriesheim and Francis Yammarino also are notable levels of analysis scholars, with all three playing a critical role in introducing and/or further developing levels of analysis within organizational science (Dansereau & Yammarino, 1998a,b, 2000, 2003, 2005; Dansereau, Yammarino, & Kohles, 1999; Dansereau et al., 1984; Schriesheim, Castro, & Cogliser, 1999; Schriesheim, Castro, & Yammarino, 2000; Schriesheim, Castro, Zhou, & Yammarino, 2001; Schriesheim, Cogliser, & Neider, 1995; Yammarino, 1996; Yammarino & Bass, 1991; Yammarino & Dansereau, 2002, 2004, 2011).

Thus, the 25-year history of LQ is closely aligned with the history of levels of analysis development within the field of organizational behavior. However, the intersection of key LQ editorial board members with key levels of analysis scholars during the time period both the journal and levels of analysis were fledging entities begets some interesting questions. What role did LQ play in advancing general leadership scholarship, while at the same time advancing levels of analysis issues within the field of organizational behavior?

While Bass’s (1990) early vision for LQ included leadership research across a variety of levels, LQ began moving to the forefront of levels-based organizational research soon after its inception. Leadership Quarterly’s role as an early leader within multi-level research may be related to Fran Yammarino’s tenure at the editorial helm, where he served as editor (1991–1992) and senior editor (1992–1998) of the journal. During this time, editorial vision and direction for the journal tended to consider the importance of levels of analysis in research. One of the authors (F.J. Yammarino) during his time as editor and senior editor of LQ said that while “not requiring a levels-based focus outright, authors and reviewers were encouraged to consider research within a levels-based lens.”

Moreover, besides the aforementioned core LQ/levels of analysis scholars, over the next 25 years several other scholars of levels of analysis would pass through the LQ editorial board, ensuring LQ a healthy understanding of the importance of levels of analysis within the scope of leadership research. Given the intersection between key levels of analysis scholars and LQ’s editorial board, what was the trajectory of levels of analyses research during LQ’s development? The unique interplay between LQ and the burgeoning levels of analysis field allows for the notion that even as a new journal, LQ was one of the academic outlets at the forefront of developing and advancing levels-based research.

With the exception of editorials, commentaries and theoretical letters, we undertook the current review of every published research (full) article in LQ over the past 25 years as means of examining the evolution of levels of analysis-based leadership research within the pages of LQ. This comprehensive examination evaluated how research published in LQ met a standard of levels-based rigor, now requested at several major journals. While Yammarino and colleagues (Dionne et al., 2012; Yammarino, Dionne, Chun, & Dansereau, 2005) have produced levels of analysis reviews of leadership research in the past, those reviews were not limited to publications within LQ, and those reviews were focused on specific and particular leadership paradigms (i.e., transformational and charisma leadership only in 2012; and 17 classic leadership models in 2005).

The current review differs in that every research article ever published in LQ is assessed, regardless of the model or paradigm represented in the research. As LQ is regarded as the top journal in leadership research (Gardner, Lowe, Moss, Mahoney, & Cogliser, 2010), a comprehensive review of all articles published within LQ can provide a proxy for the current state-of-the-science view regarding levels of analysis issues within the leadership literature. The current review assessed the “health” of levels of analysis within LQ’s portion of leadership research and therefore differs from prior reviews in its singular focus on LQ as the publication outlet. However, prior reviews that examined publication sources other than LQ enable a comparison regarding the state of levels of analysis in the leadership field within LQ and outside of LQ.

Levels of analysis assessment here proceeded based on criteria applied in prior levels of analysis reviews (Dionne, Chun, et al., 2012; Yammarino et al., 2005). Specifically, the assessment addressed four key questions related to levels of analysis
incorporation into research: 1) has the level of analysis been explicitly addressed in theory development? 2) are measures of constructs appropriate given the level of theory? 3) are data analytic tests appropriate given the level of theory? and 4) is there appropriate alignment in inferences given the theory and data analysis?

These questions/assessments are important as all theories and tests of theories should specify and test boundary conditions. In other words, because no organizational theory is unbounded, theory specification needs to include assumptions which can/should be tested. Levels of analysis are one way to specify boundary conditions (Yammarino & Dubinsky, 1994; Yammarino et al., 2005). As such, the current research evaluates the theoretical specification and appropriateness of one set of boundary conditions within LQ-based leadership research—levels of analysis.

In the following section we briefly present the basic framework proposed by Dansereau et al. (1984) which is used as the basis for coding articles included in this review. Next, we describe the coding scheme, coding process and results. Finally, we discuss the implications of 25 years of levels of analysis within LQ and offer recommendations and suggestions regarding what may be leadership’s next challenges as related to levels of analysis.

1.1. Levels of analysis framework

As noted prior, in 1984, Dansereau, Alutto and Yammarino published a book detailing a conceptual and empirical framework for understanding levels of analysis issues, particularly as related to leadership constructs and relationships. While levels of analyses had been specifically included in natural sciences research for some time, a comprehensive levels of analysis framework was surprisingly absent in organizational research despite recognition of a need for better levels specification (Boulding, 1980; Cummings, 1981; Katz & Kahn, 1978; Miller, 1978; Staw, 1980; Staw & Oldham, 1978; Van de Ven & Astley, 1981). This was surprising, given a significant portion of organizational research followed a natural science model (Behling, 1980).

Presented using a leadership approach, Dansereau et al. (1984) contribution focused on several key areas. First, they discussed various levels of analysis (i.e., entities) that were/are relevant to leadership theory: persons, dyads, groups and collectives. Individuals in organizational settings acting independently of one another represented the person level. Dyads encompassed two individuals that were interdependent on a one-to-one basis. Groups reflected two or more interdependent individuals interacting with each other (usually face to face), while collectives were composed of a clustering of individuals, groups, departments, organizations and/or societies where interdependency rests on shared expectations or hierarchical structure. Dansereau et al. (1984) asserted the degree and nature (direct or indirect) of interdependence between individuals distinguished among the levels of analysis.

The “variant approach” paradigm and/or multi-level framework Dansereau et al. (1984) promoted soon branched out to other areas of organizational research including group absence behavior (Markham, 1985; Markham & McKee, 1995), pay-for-performance (Markham, 1988), personnel ratings (Waldman, Yammarino, & Avolio, 1990), salesperson performance (Yammarino & Dubinsky, 1990), complexity theory (Anderson, 1999), innovation (Gupta, Tesluk, & Taylor, 2007) and general organizational science (Meyer, Gaba, & Colwell, 2005; Peterson, 1998). However, a strong multi-level presence continued to grow within leadership research as well (Berson & Avolio, 2004; Chun, Yammarino, Dionne, Sosik, & Moon, 2009; Dansereau, 1995; Hofmann, Morgeson, & Gerras, 2003; Jaussi & Dionne, 2003; Jung, 2001; Kark, Shamir, & Chen, 2003; Kim & Yukl, 1995; Markham, 2010, 2012; Schriesheim, Neider, & Scandura, 1998; Schriesheim et al., 1995, 2000, 2001; Sivasubramaniam, Murry, Avolio, & Jung, 2002; Sosik, Avolio, & Kahai, 1998; Sosik, Godshalk, & Yammarino, 2004; Sosik, Kahai, & Avolio, 1998; Tosi, Misangyi, Fanelli, Waldman, & Yammarino, 2004; Yammarino, Dubinsky, Comer, & Jolson, 1997; Yammarino, Spangler, & Dubinsky, 1998). Thus, the incorporation of a multi-level framework into leadership and organizational research introduced explicit levels clarification regarding individuals, dyads, groups, and collectives, where previously implicit clarification had been the norm.

For the purposes of simplifying the classification and categorization given the hundreds of articles within the dataset, we focused only on classification via the various levels of analysis (i.e., individual, dyad, group, and collective) and did not address the potentially different views and conditions within the levels of analysis (i.e., wholes/homogeneous, parts/heterogeneous, equivocal/independent, and null). As few publications address within-level views and conditions, not coding for these conditions likely did not adversely affect interpretation of the data.

Thus, the current review examined the focal level of interest of published LQ research under four conditions: explicit specification of the focal level of analysis; measurement at the focal level of analysis; use of a multi-level data analysis technique given the focal level of analysis; and alignment between theory and data. The specifics regarding how articles were coded and assessed follows in the methods section.

2. Method

The current research and coding scheme is an extension of Yammarino et al. (2005) but with a few key differences. Yammarino et al. (2005) focused on research from 1995 to 2005 included in a variety of books, book chapters and academic journals. As the purpose of the current review represents a more specific assessment of levels of analysis evolution within the 25-year history of Leadership Quarterly, only articles published in LQ were included in the current review. Leadership research in other publication outlets was excluded.

Another key difference between the current review and the Yammarino et al. (2005) review is related to categorization of leadership research. Conceptual and empirical leadership articles included in the 2005 review were categorized on the basis of 17 “traditional” approaches to leadership: Ohio State, contingency, participative, charismatic, transformational, leader–member
exchange, information processing/implicit, substitutes, romance, self-leadership, multiple linkages, multilevel/leaderplex, individualized, path-goal, vertical dyad linkage, situational, and influence tactics. That review resulted in 348 articles in 1995–2005, which reflected a state-of-the-science review across multiple publication outlets for the specific 17 categories represented in Yammarino et al. (2005).

While many articles included in the 2005 review were published in LQ, there were several articles within LQ during 1995–2005 that did not represent any of the 17 more traditional approaches to leadership research. As such, these articles were excluded from the 2005 review. Moreover, there were several articles published in LQ prior to 1995, all of which were excluded from the 2005 levels-based assessment. Thus, another key difference between the current and prior review is that all research articles published in LQ have been included in the current review, including those published from 1990 to 1995, and those that were excluded from the 2005 review because they did not neatly represent any of the 17 traditional approaches to leadership.

2.1. Leadership categorization

To offer a more complete picture of the progress of levels of analysis within leadership literature, and take stock of how that progress has evolved within the pages of LQ, the current review increased the number of leadership theories, models and approaches, called categories here, to 29. The increase in categorization options was designed to be more inclusive and offer a more flexible categorization system. In part, the category expansions also relied on leadership classifications presented in Gardner et al. (2010), who identified several prominent leadership categories as part of a review of LQ’s second decade of themes, trends and scholarly contributions. The resulting 29 leadership categories are as follows (in alphabetical order, with new methods and analytic techniques, multiple theories, and general categories at the end): authentic leadership, behavioral theories, charismatic leadership, charismatic–ideological–pragmatic model, cognitive theories, collectivistic theories, contingency theories, creativity and innovation, culture and diversity, emotions, ethical leadership, executive leadership, follower-centric theories, leader–follower relations, leader–member exchange (LMX), leadership development, leadership emergence, leadership in teams and groups, motivational theories, politics and public leadership, power and influence tactics, spiritual leadership, substitutes for leadership, trait theories, transformational leadership, vertical dyad linkage (VDL) and individualized leadership, new methods and analytic techniques, multiple theories, and general.

While a few categories are the same as those in the Yammarino et al. (2005) review (e.g., transformational, charismatic, power and influence, and substitutes for leadership), new classifications were added, while other classifications were combined and or expanded, based on the behavior and/or nature of subcategories. For example, the classification “Behavioral Theories” incorporates both articles on the Ohio State model of leadership, which had its own classification in the Yammarino et al. (2005) review, as well as several other articles which may not necessarily have the same behaviors represented as the Ohio State model. These expanded categories better enabled inclusion of all leadership research, both old and new, published within LQ, especially research that did not/would not fall within the 17 traditional categories represented in the 2005 review. More detailed descriptions of each coding category precede the discussion of results within each of the 29 categories.

2.2. Data collection

The current review encompassed all leadership research published in LQ from 1990 through June, 2013. Editorials, introductions and theoretical letters were excluded from data as they did not represent leadership research per se; however, all other articles were included in the data. Therefore, the current review codes the population of leadership research published within the pages of LQ from its inception in 1990 to the latest issue (June 2013), which reflects 790 articles. Once identified for inclusion, all articles were subjected to coding based on the coding scheme developed in Yammarino et al. (2005) to reflect levels of analysis inclusion in theory specification, measurement, data analysis and alignment of theory and data. A description of the coding process follows.

2.3. Coding scheme

2.3.1. Conceptual articles

As a starting point, articles were classified based on whether they were conceptual or empirical research. The current review included 268 conceptual articles. For conceptual articles, data recorded included author name(s), year of publication, and an assessment of whether the level of analysis was explicitly stated in theory and proposition and/or hypotheses development. Articles were coded as “explicit” if in theory and/or proposition development authors explicitly stated the level at which theory was formulated. An “implicit” rating was coded if levels of analysis were not mentioned explicitly, but coders could implicitly assume the level of analysis. An “indeterminate” rating was coded if coders were unclear of the level of analysis represented in the article.

2.3.2. Empirical articles

The current review included 522 empirical articles. Similar to conceptual articles, data recorded included author name(s) and year of publication. Additionally, for empirical articles, all variables, types of variables (i.e., independent, dependent, mediator, and moderator), relationships between variables, and type of data (i.e., qualitative or quantitative) were recorded. After that
classification, empirical articles were coded using the procedure specified in Yammarino et al. (2005) assessing theory, measurement, analysis and alignment. Descriptions of these four classifications follow.

2.3.2.1. Theory. Does the article explicitly state the level of analysis in theory and/or hypotheses formulation? Articles were coded as “explicit” if either in theory or hypotheses authors explicitly mentioned the level at which theory was formulated. An “implicit” coding was provided if the level of analysis was not mentioned explicitly, but coders could implicitly assume the level of analysis. An “indeterminate” rating was provided if coders were unclear of the level of analysis in the article.

2.3.2.2. Measurement. Did measurement of concept(s) proceed at the appropriate level of analysis? Ratings in this category reflected (a) if the concept(s) and measures were at the same level; or, (b) if measures were at a different level but aggregated appropriately to the level of the construct(s); or, (c) if measures were not aggregated appropriately to the level of the concept(s); or, (d) concept(s) and measures were at different levels of analysis; or, (e) indeterminate.

2.3.2.3. Data analysis. Did data analytic techniques align with level(s) of analysis reflected in hypotheses? Ratings in this category reflected (a) WABA used at an appropriate level; or, (b) use of some other multi-level technique correctly at the appropriate level; or, (c) incorrect use of WABA or some other multi-level technique; or, (d) no use of a multi-level technique; or, (e) indeterminate. WABA was singled out as a multi-level data analytic procedure based on prior work using this coding scheme (e.g., Yammarino et al., 2005) and because of the close alignment for testing the theoretical/conceptual approach to levels of Dansereau et al. (1984).

2.3.2.3.1. Alignment. Was there appropriate alignment between theory and data? Ratings in this category reflected (a) alignment at the appropriate level of analysis; or, (b) theory resided at some level other than the data level of analysis; or, (c) indeterminate.

2.4. Coder training and inter-rater reliability

All coders studied level of analysis issues in doctoral programs, and/or advanced training classes from the Center for Advancement of Research Methods and Analysis, and/or had prior publications which included use of the same coding procedure (Dionne, Chun, et al., 2012). Six trained coders formed three teams (i.e., two members each) to assess levels of analysis incorporation into all LQ articles. To ensure accurate and consistent coding among all three research teams for the current research, coding was performed in two training stages.

The first stage represented training on the coding procedure. Coders independently coded five empirical articles included in the Yammarino et al. (2005) review, but from a publication source other than LQ. Each coder compared their ratings with the published ratings from Yammarino et al. (2005). For each of the six coders, initial training ratings agreed with published ratings from Yammarino et al. (2005) at a rate of greater than 86% across all categories included in all articles. Each team then met in their dyad (two-person team) to discuss any discrepancies in ratings across the five articles. All discrepancies were resolved within teams at an agreement rate of 100%. Thus, there were excellent within-team agreement rates on the coding process. At the conclusion of training, each team was assigned one-third of the population of LQ articles to code, ensuring every LQ article would be coded by at least two coders.

The second stage of training involved an assessment of between-team agreement, and occurred after approximately 30% of the articles had been coded. Each team randomly selected two articles for coding by all three teams (i.e., a total of six articles) from their assigned dataset (i.e., one-third of the population of LQ articles). Pre-discussion agreement rates for individual teams exceeded 90%, and discrepancies in ratings within-team were resolved to produce within-team agreement rates of 100%. Then, all three teams met to review the team ratings of the six articles. Pre-discussion agreement rates across teams exceeded 92%, and discrepancies in ratings were resolved to produce 100% agreement between teams. Thus, there were excellent within- and between-team agreement rates.

Within-team agreement for each team on their assigned articles (approximately 263 articles each team) exceeded 85% before within-team discussions. Following within-team discussions of discrepancies, each team achieved 100% agreement on their assigned articles. Thus, within-team agreement rates remained acceptable.

3. Results

Results reflect combined ratings from all three coding teams, each of which coded one-third of the articles included in the current review. Results are presented by leadership category, in terms of the number of articles coded within a particular levels of analysis assessment area (i.e., theory, measurement, data analysis, and alignment) which reflected appropriate incorporation of levels of analysis. For conceptual articles, only levels incorporation into theory was assessed; however, the highest standard was achieved when authors explicitly stated the level at which theory was formulated.

As a note, because leadership research grew from a predominantly individual level of analysis focus (Yammarino et al., 2005), early theories, measures and analyses were designed for the individual level of analysis. As such, achieving alignment would be easier within this level of analysis, as measures do not need to adapt to changing referents or be aggregated, and data analysis techniques do not need to accommodate higher levels of analysis. As more complexity related to level of analysis was introduced via higher-level and/or multi-level leadership theories, theory, hypotheses, measures and data analytic techniques would need to
accommodate this complexity. Thus, alignment in theories where the level resides above the individual level of analysis is arguably harder to achieve.

For empirical articles, levels incorporation into four areas was reported: theory, measurement, data analysis and alignment. The highest standard of levels of analysis incorporation was achieved when authors (a) explicitly stated the level at which theory was formulated; (b) when concept(s) and measures were at the same level, or if measures were at a different level but aggregated appropriately to the level of the construct(s); (c) when WABA or some other multi-level data analysis technique was applied correctly at the appropriate level; and (d) when alignment between theory and data was at the appropriate level of analysis.

Finally, for summative purposes, Table 1 includes a column reflecting the overall levels-based theoretical specification within each of the 29 categories, or in other words, summed results from the conceptual articles and empirical articles regarding theoretical specification. Theory was the only levels-based standards area where data could be summed, as (obviously) conceptual articles do not have measures, analytic methods or alignment.

A brief description of the types of articles included in each leadership categorization is discussed below, along with specific results by leadership category. All results, for all leadership theories and categories and overall, are presented in Table 1.

### 3.1. Authentic leadership

Although there are some disagreements on the definition of this construct (Gardner, Cogliser, Davis, & Dickens, 2011; Kalshoven, Den Hartog, & De Hoogh, 2011), authentic leadership concerns being genuine, being transparent to others, being self-aware, and possessing moral standards and values (Neider & Schriesheim, 2011). It differs from transformational leadership in that authentic leaders do not have to be transformational or charismatic–authentic leaders can be genuine and honest, but may not necessarily transform others to go “above and beyond expectations” (Gardner et al., 2011). Still, others assert authentic

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### Table 1
Incorporation of levels of analysis in conceptual and empirical articles by major leadership theory.

<table>
<thead>
<tr>
<th>Leadership theory</th>
<th>Conceptual articles</th>
<th>Empirical articles</th>
<th>Empirical &amp; conceptual articles combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Levels reflected in theory</td>
<td>Levels reflected in measurement</td>
<td>Levels reflected in data analysis</td>
</tr>
<tr>
<td>Authentic leadership</td>
<td>4/12 (33%)</td>
<td>3/7 (43%)</td>
<td>6/7 (86%)</td>
</tr>
<tr>
<td>Behavioral theories</td>
<td>2/5 (40%)</td>
<td>9/33 (27%)</td>
<td>26/33 (79%)</td>
</tr>
<tr>
<td>Charismatic leadership</td>
<td>5/20 (25%)</td>
<td>8/43 (19%)</td>
<td>33/43 (77%)</td>
</tr>
<tr>
<td>Charismatic–ideological–pragmatic model</td>
<td>1/1 (100%)</td>
<td>0/8 (0%)</td>
<td>8/8 (100%)</td>
</tr>
<tr>
<td>Cognitive theories</td>
<td>6/15 (40%)</td>
<td>6/29 (21%)</td>
<td>25/29 (86%)</td>
</tr>
<tr>
<td>Collectivistic theories</td>
<td>12/17 (71%)</td>
<td>12/25 (48%)</td>
<td>23/25 (92%)</td>
</tr>
<tr>
<td>Contingency theories</td>
<td>5/7 (71%)</td>
<td>1/10 (10%)</td>
<td>7/10 (70%)</td>
</tr>
<tr>
<td>Creativity and innovation</td>
<td>4/13 (31%)</td>
<td>6/13 (46%)</td>
<td>9/13 (69%)</td>
</tr>
<tr>
<td>Culture and diversity</td>
<td>3/10 (30%)</td>
<td>3/17 (18%)</td>
<td>13/17 (76%)</td>
</tr>
<tr>
<td>Emotions</td>
<td>2/4 (50%)</td>
<td>2/12 (17%)</td>
<td>8/12 (67%)</td>
</tr>
<tr>
<td>Ethical leadership</td>
<td>3/10 (30%)</td>
<td>4/11 (36%)</td>
<td>9/11 (82%)</td>
</tr>
<tr>
<td>Executive leadership</td>
<td>12/21 (57%)</td>
<td>5/20 (25%)</td>
<td>18/20 (90%)</td>
</tr>
<tr>
<td>Follower-centric theories</td>
<td>3/7 (43%)</td>
<td>3/11 (27%)</td>
<td>7/11 (64%)</td>
</tr>
<tr>
<td>Leader–follower relations</td>
<td>3/9 (33%)</td>
<td>6/15 (40%)</td>
<td>11/15 (73%)</td>
</tr>
<tr>
<td>Leader–member exchange</td>
<td>6/10 (60%)</td>
<td>27/32 (84%)</td>
<td>20/32 (63%)</td>
</tr>
<tr>
<td>Leadership development</td>
<td>1/6 (17%)</td>
<td>3/14 (21%)</td>
<td>13/14 (93%)</td>
</tr>
<tr>
<td>Leadership emergence</td>
<td>0/1 (0%)</td>
<td>4/13 (31%)</td>
<td>13/13 (100%)</td>
</tr>
<tr>
<td>Leadership in teams and groups</td>
<td>2/5 (67%)</td>
<td>2/4 (50%)</td>
<td>3/4 (75%)</td>
</tr>
<tr>
<td>Motivational theories</td>
<td>0/3 (0%)</td>
<td>1/5 (20%)</td>
<td>5/5 (100%)</td>
</tr>
<tr>
<td>Politics and public leadership</td>
<td>4/14 (29%)</td>
<td>2/31 (6%)</td>
<td>25/31 (81%)</td>
</tr>
<tr>
<td>Power and influence tactics</td>
<td>1/2 (50%)</td>
<td>1/6 (17%)</td>
<td>4/6 (67%)</td>
</tr>
<tr>
<td>Spiritual leadership</td>
<td>0/6 (0%)</td>
<td>4/6 (67%)</td>
<td>3/6 (50%)</td>
</tr>
<tr>
<td>Substitutes for leadership</td>
<td>0/3 (0%)</td>
<td>2/5 (40%)</td>
<td>3/5 (60%)</td>
</tr>
<tr>
<td>Trait theories</td>
<td>3/19 (16%)</td>
<td>4/4 (44%)</td>
<td>39/44 (89%)</td>
</tr>
<tr>
<td>Transformational leadership</td>
<td>2/13 (15%)</td>
<td>3/5 (60%)</td>
<td>57/65 (88%)</td>
</tr>
<tr>
<td>VDL and individualized leadership</td>
<td>1/1 (100%)</td>
<td>3/3 (100%)</td>
<td>2/3 (67%)</td>
</tr>
<tr>
<td>New methods and analytic techniques</td>
<td>3/12 (25%)</td>
<td>12/23 (52%)</td>
<td>18/23 (78%)</td>
</tr>
<tr>
<td>Multiple theories category</td>
<td>2/5 (40%)</td>
<td>0/2 (0%)</td>
<td>2/2 (100%)</td>
</tr>
<tr>
<td>General</td>
<td>10/19 (53%)</td>
<td>6/15 (40%)</td>
<td>14/15 (93%)</td>
</tr>
<tr>
<td>All approaches(29 leadership categories)</td>
<td>100/268 (37%)</td>
<td>174/522 (33%)</td>
<td>424/522 (81%)</td>
</tr>
<tr>
<td>All approaches in Yammarino et al. (2005)</td>
<td>51/137 (37%)</td>
<td>53/211 (25%)</td>
<td>111/211 (53%)</td>
</tr>
</tbody>
</table>
Leadership is a “root concept” for transformational and charismatic leadership, as well as other similar leadership styles such as spiritual, servant, and ethical leadership (Ilies, Morgeson, & Nahrgang, 2005). Moreover, some suggest authentic leadership differs from ethical leadership in that authentic leaders do not necessarily have to be moral or fair (Shamir & Eilam, 2005; Sparrowe, 2005), while others argue there is a moral component to authentic leadership (see Avolio & Gardner, 2005; Brown, Treviño, & Harrison, 2005; Neider & Schriesheim, 2011; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008).

3.1.1. Conceptual
More than half of the articles coded in this category were conceptual (63%, or 12/19), though only 33% (4/12) explicitly stated the levels of analysis in theory.

3.1.2. Empirical
For empirical articles, 43% (3/7) explicitly stated the levels of analysis in theory. Levels reflected in measurement and alignment of theory and data were both high (86%, or 6/7) and levels reflected in data analysis was low (14%, or 1/7). However, 71% (5/7) of the time, concepts were measured at the appropriate level and/or properly aggregated, thus multi-level techniques were not necessary.

3.2. Behavioral theories
Behavioral theories address what leaders do, how they act, and the characteristics and behaviors that can be learned to make leaders better. Behavioral approaches, Ohio State Studies (see Stodgill & Coons, 1957), and leadership skills are topics included in this category (Fleishman et al., 1991; Schriesheim et al., 1995).

3.2.1. Conceptual
Levels of analysis in theory were explicitly stated in 40% (2/5) of the conceptual articles.

3.2.2. Empirical
Most articles (87%, or 33/38) were empirical, and levels of analysis in theory were explicitly stated in only 27% (9/33) of the empirical articles. Levels reflected in measurement and levels alignment of theory and data were high (79%, or 26/33 for both). Levels reflected in data analysis was only 9% (3/33). However, nearly half of the empirical articles were at the individual level of analysis (48% or 16/33), and of the remaining articles at a higher level of analysis, most were measured or aggregated appropriately (76%, or 10/13). Thus, in many studies, no multi-level techniques were used.

3.3. Charismatic leadership
Charismatic leadership focuses on leaders influencing followers, where the effects of charismatic leadership are follower motivation, commitment, and trust, respect and loyalty to the leader (Conger & Kanungo, 1987; House, 1977; House & Shamir, 1993; Shamir, House, & Arthur, 1993). Charismatic leaders are able to connect followers’ self-concepts to a collective and they arouse certain motives in followers, which influence self-sacrifice for the sake of the collective’s goals (Shamir, 1991). Charismatic behaviors can include articulating an optimistic vision of the future, taking personal risk, engaging in unconventional behaviors, being sensitive to follower and environmental needs, image building, and empowering followers (House & Shamir, 1993; House, Spangler, & Woycke, 1991).

3.3.1. Conceptual
Only 25% (5/20) of conceptual charismatic leadership articles published in LQ explicitly stated the level at which theory was formulated.

3.3.2. Empirical
Levels reflected in theory were explicitly stated only 19% (8/43) of the time. Concepts and measures were at the same level of analysis in 77% (33/43) of the articles. However, of the 33 articles measured at the correct level or aggregated appropriately, 64% were at the individual level of analysis, which helps produce higher ratings in this category. Due to many individual-level studies and studies that appropriately aggregated all constructs to one level, the levels reflected in data analysis is low, given that multilevel techniques were not necessary (only 16% of the studies used a multilevel technique, 7/43). Finally, appropriate alignment of theory and data was moderate (67%, or 29/43).

3.4. Charismatic-–ideological–pragmatic model
The Charismatic–Ideological–Pragmatic (CIP) Model of leadership proposes that there are three possible pathways to outstanding leadership: charismatic, ideological, and pragmatic leadership. Each pathway differs in regard to leaders’ mental models and behaviors, where charismatic leaders use positive emotion and focus on the future, ideologues use negative emotion and focus on the past, and pragmatic leaders are very rational, focusing on the present (Bedell-Avers, Hunter, & Mumford, 2008;
Eubanks et al., 2010; Hunter, Bedell-Avers, & Mumford, 2009; Ligon, Hunter, & Mumford, 2008; Mumford, 2006; Mumford, Antes, Caughron, & Friedrich, 2008; Mumford & Van Doorn, 2001; Strange & Mumford, 2005).

3.4.1. Conceptual
The only conceptual article explicitly stated the levels of analysis in theory (100%, or 1/1).

3.4.2. Empirical
All empirical articles implicitly stated the levels of analysis in theory (i.e., none were explicit, 0%, or 0/8). Levels in measurement and alignment of theory and data achieved 100% (8/8) and there were no multi-level techniques used, however, all but two articles (75%, or 6/8) were at the individual level of analysis.

3.5. Cognitive theories
Articles that touched upon cognitive theories were included in this category. Such topics included implicit leadership theory, information processing, leader prototypes, and leader cognition (Antes & Mumford, 2012; Dionne, Sayama, Hao, & Bush, 2010; Hall & Lord, 1995; Keller, 1999; Lord & Emrich, 2000; Lord & Shondrick, 2011; Mumford, Connelly, & Gaddis, 2003; Mumford, Friedrich, Caughron, & Byrne, 2007; Pierro, Cicero, Bonaiuto, van Knippenberg, & Kruglanski, 2005; van Knippenberg, 2011; van Quaquebeke, van Knippenberg, & Brodbeck, 2011; Zaccaro, Mumford, Connelly, Marks, & Gilbert, 2000).

3.5.1. Conceptual
A modest 40% (6/15) of conceptual cognitive theory articles published in LQ explicitly stated the level at which theory was formulated.

3.5.2. Empirical
Levels explicitly reflected in theory for empirical articles was 21% (6/29). As most studies were conducted at the individual level of analysis (62%, or 18/29), levels reflected in measurement and alignment of theory and data are high (both are 86%, or 25/29). Moreover, all research in this category did not employ any multi-level technique, as most were at the individual level, thus the 0% rating for levels in data analysis.

3.6. Collectivistic theories
Collectivistic leadership theories look at leadership at a higher level of analysis than traditional leadership approaches, which often look at the individual, dyad, or small group levels of analysis. Collectivistic theories, in contrast, look at larger organizational collectives, alliances and network levels, and acknowledge that leadership can involve more than one individual or that the leadership role can change over time. This is known as the new “we” or collectivistic leadership approach (see Yammarino, Salas, Serban, Shirreffs, & Shuffler, 2012). Articles in this category include shared leadership, team leadership, distributed leadership, participative leadership, network leadership, complexity leadership, collective leadership, entrepreneurial leadership, complex leadership, self-leadership, and empowering leadership. Self-leadership and empowering leadership were included here, as they have aspects of giving followers independence, autonomy and the power to make decisions and take part in leading themselves or the group (Balkundi & Kilduff, 2006; Contractor, DeChurch, Carson, Carter, & Keegan, 2012; Friedrich, Vessey, Schuelke, Ruark, & Mumford, 2009; Hoppe & Reinelt, 2010; Kramer & Crespy, 2011; Marion & Uhl-Bien, 2001; Markham & Markham, 1995; Mehra, Smith, Dixon, & Robertson, 2006; Pearce, Manz, & Sims, 2008; Pittinsky & Simon, 2007; Selsky & Smith, 1994; Uhl-Bien & Marion, 2009; Vecchio, Justin, & Pearce, 2010).

3.6.1. Conceptual
For conceptual articles, 71% (12/17) explicitly stated levels of analysis in theory.

3.6.2. Empirical
Levels reflected in theory for empirical articles was 48% (12/25). Levels properly reflected in measurement and alignment of theory and data were high (92%, or 23/25 and 88%, or 22/25, respectively). Again, despite the collectivistic nature, because most articles were at the individual level of analysis or because constructs were appropriately aggregated to a higher level of analysis, many studies did not require a multi-level technique and therefore incorporation into data analysis was low (16%, or 4/25).

3.7. Contingency theories
In the 1960s and 1970s, some researchers were disappointed in trait and behavioral theories, arguing that these theories failed to explain enough variance. Thus, researchers proposed contingency theories, which explained leader performance and effectiveness depended on the situation and other contingencies. Thus, this category includes the contingency model (Fiedler, 1967), situational leadership, multiple linkage model, and operant leadership (Ayman, Chemers, & Fiedler, 1995; Fernandez & Vecchio, 1997; Graeff, 1997; Kim & Yukl, 1995; Thompson & Vecchio, 2009; Vroom & Jago, 1995).
3.7.1. Conceptual
For conceptual articles, 71% (5/7) explicitly stated levels of analysis in theory.

3.7.2. Empirical
Only 10% (1/10) of empirical articles explicitly stated the level of analysis in theory development. For appropriate levels reflected in measures as well as alignment of theory and data, 70% (7/10) of empirical articles achieved this standard. Though only 10% (1/10) had levels reflected in data analysis, several articles were at the individual level of analysis or had properly aggregated data to a higher level, which did not require a multi-level technique.

3.8. Creativity and innovation
Included in this category is research examining how leaders can creatively solve problems, lead creative people, increase creativity among employees, and create an environment that is conducive for creativity. Other topics include leaders as champions and the role of leadership in organizational innovation (Amabile, Schatzel, Moneta, & Kramer, 2004; Jaussi & Dionne, 2003; Jung, Chow, & Wu, 2003; Mumford & Connelly, 1991; Mumford, Scott, Gaddis, & Strange, 2002; Shalley & Gilson, 2004; Zhou & George, 2003).

3.8.1. Conceptual
Levels of analysis in theory were explicitly stated in 31% (4/13) of the conceptual articles.

3.8.2. Empirical
Levels of analysis in theory were explicitly stated in 46% (6/13) of the empirical articles. Levels reflected in measurement was 69% (9/13), while alignment of theory and data was slightly lower at 62% (8/13). Multi-level techniques were used in 31% (4/13) of the studies.

3.9. Culture and diversity
Research that addressed culture, diversity, and GLOBE studies in leadership are a part of this category. Many articles looked at leadership from a cross-cultural perspective by comparing leaders from different countries and cultures (Dorfman et al., 1997; Faris & Parry, 2011; Hanges & Dickson, 2006; Peterson & Hunt, 1997).

3.9.1. Conceptual
Levels of analysis in theory were explicitly stated in 30% (3/10) of the conceptual articles.

3.9.2. Empirical
Most articles (63%, or 17/27) were empirical, and levels of analysis in theory were explicitly stated in only 18% (3/17) of the empirical articles. Levels reflected in measurement was 76% (13/17), but levels alignment of theory and data was lower at 59% (10/17). Thus, over 40% of the articles did not have proper alignment or were indeterminate in regard to alignment. Levels reflected in data analysis was 6% (1/17), as only one article used a multi-level technique.

3.10. Emotions
Emotions and affect in leadership have recently received increased attention. Research in this category examines emotional intelligence, affect, emotion, emotional labor, empathy, and emotional contagion (Dasborough, 2006; Gaddis, Connelly, & Mumford, 2004; Gardner, Fischer, & Hunt, 2009; Gooty, Connelly, Griffith, & Gupta, 2010; Rajah, Song, & Arvey, 2011; Sadri, Weber, & Gentry, 2011; Visser, van Kippenberg, van Kleef, & Wisse, 2013).

3.10.1. Conceptual
Half of the conceptual articles (50%, or 2/4) explicitly stated the levels of analysis in theory.

3.10.2. Empirical
Only 17% (2/12) of the empirical articles explicitly stated the levels of analysis in theory, which is a much lower achievement than the emotions conceptual articles. Levels reflected in measurement and alignment of theory and data were both 67% (8/12). Levels reflected in data analysis was 17% (2/12).

3.11. Ethical leadership
Ethical leadership concerns doing what is right, being fair, having integrity, sharing power, caring about the environment, and guiding others ethically by communicating about ethics, explaining ethical rules, and rewarding ethical behavior among subordinates. Ethical leadership differs from the closely related transformational leadership in that transformational leaders need
not always be ethical, depending on their leadership orientation (socialized/authentic or personalized/pseudo transformational) 
(Brown & Treviño, 2006; Craig & Gustafson, 1998; Eisenbeiss, 2012; Kalshoven et al., 2011; Palanski & Yammarino, 2009).

3.11.1. Conceptual  
Nearly half of the articles coded in ethical leadership were conceptual (48%, or 10/21). For these articles, 30% (3/10) explicitly stated levels of analysis in theory.

3.11.2. Empirical  
For empirical articles, the theoretical rating of explicit levels incorporation was only slightly higher (36%, or 4/11). Levels reflected in measurement and alignment of theory and data were high (both at 82%, or 9/11). Levels reflected in data analysis was 18% (2/11), although most articles did not require a multi-level technique.

3.12. Executive leadership  
Executive leadership included articles that discussed topics such as top management teams, strategic leadership, leader succession and issues relating to CEOs and Board of Directors (Barrick, Day, Lord, & Alexander, 1991; Carmeli, Schaubroeck, & Tishler, 2011; Giambatista, Rowe, & Riaz, 2005; Hunt, Boal, & Sorenson, 1990; Knights & Morgan, 1992; Makri & Scandura, 2010; Rowe, Cannella, Rankin, & Gorman, 2005; Sosik, Gentry, & Chun, 2012; Tsui, Zhang, Wang, Xin, & Wu, 2006).

3.12.1. Conceptual  
For conceptual articles, more than half (57%, or 12/21) explicitly stated levels of analysis in theory.

3.12.2. Empirical  
Only 25% (5/20) of empirical executive leadership articles explicitly stated the level of analysis in theory. Achievement for levels reflected in measurement and alignment of theory and data was high (90%, or 18/20; and 85%, or 17/20, respectively). Despite the fact that levels reflected in data analysis was low (10%, or 2/20), several articles measured variables at the correct level of analysis or properly aggregated to a higher level.

3.13. Follower-centric theories  
Articles in this category specifically focus on followers, and include topics such as followership, romance of leadership, and servant leadership. Romance of leadership theory states it is the followers who attribute leadership to good outcomes. Servant leadership concerns serving the followers and placing followers’ interests first (Bligh, Kohles, & Pillai, 2011; Graham, 1991; Hunter et al., 2013; Liden, Wayne, Zhao, & Henderson, 2008; Meindl, 1995).

3.13.1. Conceptual  
Levels of analysis in theory were explicitly stated in 43% (3/7) of the conceptual articles.

3.13.2. Empirical  
Levels of analysis in theory were explicitly stated in 27% (3/11) of the empirical articles. Levels reflected in measurement and levels alignment of theory and data were both 64% (7/11). Levels reflected in data analysis was 36% (4/11). Approximately 45% (5/11) of the empirical articles were at the individual level of analysis.

3.14. Leader–follower relations  
This category focuses on leader and follower relations and interactions. Relational leadership falls here, as well as articles that model the congruence and fit between leaders and followers (Fleenor, McCauley, & Brutus, 1996; Fleenor, Smither, Atwater, Braddy, & Sturm, 2010; Landry & Vandenberghe, 2012; Uhl-Bien, 2006).

Levels of analysis in theory were explicitly stated in 33% (3/9) of the conceptual articles.

3.14.2. Empirical  
Levels of analysis in theory were explicitly stated in 40% (6/15) of the empirical articles. Levels reflected in measurement and levels alignment of theory and data were both at 73% (11/15). Levels reflected in data analysis was 27% (4/15). Again, several articles were measured at the appropriate level of analysis or were properly aggregated to a higher level, thus requiring no multi-level techniques.
3.15. Leader–member exchange

Traditional research assumed that leaders treated their subordinates similarly (Average Leadership Style Approach). However, vertical dyad linkage theory (Dansereau, Graen, & Haga, 1975) challenged this view by asserting leaders treated subordinates differently within a group. From this theory emerged leader–member exchange (LMX) theory. LMX is an exchange or transaction-based relationship theory, where leaders initiate a relationship with a subordinate by requesting something to be done, to which the subordinate responds by completing the task in exchange for something. This exchange relationship can then develop from the stranger stage to the acquaintance stage, and ultimately to the mature stage, where there is a high quality relationship characterized by support, respect, trust and obligation. Those with better relationships are part of the “in-group” and those with a relationship that is characterized by only economic (and not social) exchange are part of the “out-group” (Chang & Johnson, 2010; Gooty, Serban, Thomas, Gavin, & Yammarino, 2012; Graen & Uhl-Bien, 1995; Henderson, Liden, Gibkowski, & Chaudhry, 2009; Schriesheim & Cogliser, 2009; Schriesheim et al., 1999; Zhou & Schriesheim, 2009).

3.15.1. Conceptual

For conceptual articles, 60% (6/10) explicitly stated levels of analysis in theory. One conceptual article was coded as “indeterminate.”

3.15.2. Empirical

For empirical articles, levels reflected in theory was much higher (84%, or 27/32) than those of the rating for conceptual LMX articles. Levels reflected in measurement, data analysis, and alignment of theory and data were modestly rated at 63% (20/32), 25% (8/32), and 59% (19/32), respectively.

3.16. Leadership development

Understanding where leaders come from, how they develop, and how they can be developed is important for building the next generation of leaders. Research in this category addresses how life events, parenting, and environment influence leader development as well as how leaders can be coached and trained to be more effective at the intrapersonal and interpersonal levels (Avolio, Avey, & Quisenberry, 2010; Day, 2011; Day & Sin, 2011; Ely et al., 2010; Murphy & Johnson, 2011).

3.16.1. Conceptual

Levels of analysis in theory were explicitly stated in only 17% (1/6) of the conceptual articles.

3.16.2. Empirical

Levels of analysis in theory were explicitly stated only 21% (3/14) of the time for empirical articles. However, levels reflected in measurement and levels alignment of theory and data were both high (93%, or 13/14). Levels reflected in data analysis was 14% (2/14). However, many articles were at the individual level of analysis or had appropriately aggregated to a higher level.

3.17. Leadership emergence

Articles in this category discuss how and when leaders emerge as well as the role of intelligence, personality, and emotion in leadership emergence (Guastello, 2007; Smith & Foti, 1998; Walter, Cole, der Vegt, Rubin, & Bommer, 2012; Wolff, Pescosolido, & Druskat, 2002).

3.17.1. Conceptual

For this category there was only a single conceptual article, and the level of analysis for theory was not explicitly stated (i.e., 0%, or 0/1).

3.17.2. Empirical

For empirical articles, the levels were explicitly stated in theory 31% (4/13) of the time. Levels in measurement achieved a 100% (13/13), in that all articles employed measurement at the correct level or aggregated to the correct level of analysis. This is a substantial achievement for this domain of research, considering not even half (46%) the articles were at the individual level of analysis. Most articles did not need to use a multi-level technique, thus levels reflected in data analysis was only 15% (2/13).

3.18. Leadership in teams and groups

This category contains research regarding leaders of teams. Leaders in these teams are appointed, whereas in leadership emergence an individual surfaces from within the team as a leader (Day, Gronn, & Salas, 2004, 2006; Zaccaro, Rittman, & Marks, 2001).

3.18.1. Conceptual

Two-thirds of the conceptual articles (67%, or 2/3) explicitly stated the levels of analysis in theory.
3.18.2. Empirical

Levels of analysis in theory was explicitly stated half of the time (50%, or 2/4) for empirical articles. Levels reflected in measurement was 75% (3/4), however levels alignment of theory and data was 50% (2/4). Levels reflected in data analysis was 25% (1/4).

3.19. Motivational theories

Motivational theories in leadership include topics and theories such as path-goal theory (House, 1971, 1996), intrinsic and extrinsic motivation, the Pygmalion effect (Eden, 1992; White & Locke, 2000), work related to the Thematic Apperception Test and McClelland (Winter, 1991), and the motivational roots of leadership (Gottfried et al., 2011).

3.19.1. Conceptual

Although there were only three conceptual articles, levels of analysis in theory was never explicitly stated in a single article (0%, or 0/3).

3.19.2. Empirical

Levels of analysis were explicitly stated in theory for only 20% (1/5) of empirical articles. On a positive note, there were no problems with levels reflected in measurement, as all constructs and measures were at the same level (100%, or 5/5) and alignment of theory and data fared the same (100%, or 5/5). No multi-level techniques were used, as the majority of the articles were at the individual level of analysis (80%, or 4/5).

3.20. Politics and public leadership

Any theoretical or empirical research that examined presidents, governors, senators, kings, military, or international politics were included in this category. Some of these studies explored leadership styles between countries, voters' perceptions, case studies of specific leaders, and physical characteristics of such leaders (Immelman, 1998; Kaarbo & Hermann, 1998; Pillai & Williams, 1998; Stulp, Buunk, Verhulst, & Pollet, 2013; Williams, Pillai, Lowe, Jung, & Herst, 2009).

3.20.1. Conceptual

Levels of analysis in theory were explicitly stated in 29% (4/14) of the conceptual articles.

3.20.2. Empirical

For empirical articles, levels of analysis was rarely explicitly stated (6%, or 2/31). However, there was an improvement with regard to levels reflected in measurement and alignment of theory and data, as both were at 81% (25/31), although, the majority of the articles were at the individual level of analysis (58%, or 18/31). Of the 31 empirical articles, only one used a multi-level technique (3%).

3.21. Power and influence tactics

In order to influence others, leaders can use power as a source of influence or they can use influence tactics, such as rational persuasion, inspirational appeal, consultation, ingratiation, personal appeal, exchange, coalition tactics, pressure, legitimacy tactics, collaboration, and apprising (House, 1991; Kipnis, Schmidt, & Wilkinson, 1980; Schriesheim & Hinkin, 1990; Yukl, Chavez, & Seifert, 2005; Yukl & Falbe, 1990).

3.21.1. Conceptual

Of the two conceptual articles, only one explicitly stated the levels of analysis (50%, or 1/2) and the other article had an implicit rating.

3.21.2. Empirical

Only 17% (1/6) of empirical power and influence articles explicitly stated the level of analysis in theory formulation. Levels in measurement and alignment of theory and data were both 67% (4/6). No article used a multi-level technique (0%, or 0/6).

3.22. Spiritual leadership

Spiritual leadership involves creating a vision that gives meaning and purpose to work. It also encompasses developing a culture of mutual care and concern between a leader and followers. These aspects result in close membership and a sense of identity and appreciation, which ultimately leads to organizational commitment and productivity (Dent, Higgins, & Wharff, 2005; Fry, 2003; Fry, Hannah, Noel, & Walumbwa, 2011; Fry, Vitucci, & Cedillo, 2005; Hicks, 2002).
3.22.1. Conceptual
Of all the articles within the spiritual leadership category, half were conceptual and none of them explicitly stated levels of analysis in theory (0%, or 0/6).

3.22.2. Empirical
For empirical articles, 67% (4/6) explicitly stated the levels of analysis in theory. Levels reflected in measurement and alignment of theory and data were both only 50% (3/6). Levels reflected in data analysis was 0% (0/6); however, 67% percent (4/6) did not require a multi-level technique.

3.23. Substitutes for leadership
Subordinate, task, and organizational variables can substitute for, or neutralize, leadership. Substitutes act in place of a leader’s behavior and neutralizers block a leader’s behavior. This theory attempted to explain inconsistencies in the literature by showing when leaders could and could not be influential (Kerr & Jermier, 1978; Nübold, Muck, & Maier, 2013; Podsakoff & MacKenzie, 1995, 1997; Podsakoff, MacKenzie, & Fetter, 1993; Schriesheim, 1997).

3.23.1. Conceptual
Of the three conceptual articles, none explicitly stated the levels of analysis in theory (0% or 0/3).

3.23.2. Empirical
Only 40% (2/5) of empirical articles explicitly stated the levels of analysis in theory. For levels reflected in measurement, 60% (3/5) measured concepts at the level of theory, with the remaining two articles employing qualitative measures that were unable to be evaluated. Thus, alignment of theory and data mirrors the 60% (3/5) rating received from the measurement incorporation. Levels reflected in data analysis was 20% (1/5).

3.24. Trait theories
Topics included under this category are those that refer to stable characteristics of individuals or other inherent characteristics that define a leader. For example, articles that discussed dispositions, gender, personality, attributes, intelligence, and dark side and destructive leadership such as narcissism and Machiavellianism were included in this category (Antonakis, Day, & Schyns, 2012; Arvey, Rotundo, Johnson, Zhang, & McGué, 2006; Eagly, Karau, Miner, & Johnson, 1994; Judge, Piccolo, & Kosalka, 2009; Rosenthal & Pittinsky, 2006; Schaubroeck, Walumbwa, Ganster, & Kepes, 2007; Zaccaro, Gilbert, Thor, & Mumford, 1991).

3.24.1. Conceptual
For conceptual articles, only 16% (3/19) explicitly stated levels of analysis in theory development. However, 84% were rated as implicit theoretical level incorporation, which is not surprising given that trait theory is generally developed at the individual level of analysis.

3.24.2. Empirical
In a similar finding as conceptual trait theory articles, only 9% (4/44) explicitly stated a level of analysis in theory development. Again, given the primary focus on individual level of analysis, this is not surprising, and 86% were rated as implicit theoretical level incorporation. However, levels reflected in measurement and alignment of theory and data were high (89%, or 39/44 for both). More than half of the articles (61%, or 27/44) were at the individual level of analysis and as such, the use of multi-level analysis was low (18% or 8/44).

3.25. Transformational leadership
Transformational leadership (Bass, 1985; Burns, 1978) is the most widely studied leadership theory to date (Yammarino et al., 2005). However, the theory has received criticism and its conceptualization has not always been clear, especially with regard to charismatic leadership (see Bass & Avolio, 1993; van Knippenberg & Sitkin, 2013). Nonetheless, transformational leadership is often defined in terms of leader behaviors and effects on followers, and is composed of four main dimensions: idealized influence (charisma), inspirational motivation, intellectual stimulation, and individualized consideration. Transformational leadership differs from charismatic leadership in that charisma is only one dimension of transformational leadership — that is, charisma is necessary but not sufficient for transformational leadership, despite the fact that it accounts for the largest portion of variance in the overall construct (Bass & Avolio, 1993). Though some argue that one can be charismatic without being transformational, others would disagree, emphasizing the importance of charisma in exceptional and outstanding leadership (Conger & Kanungo, 1987, 1994; House & Shamir, 1993). Ultimately, transformational leadership results in trust and respect for a leader and it motivates followers to achieve more than what is expected.
3.25.1. Conceptual

Only 15% (2/13) of conceptual transformational leadership articles published in LQ explicitly stated level at which theory was formulated.

3.25.2. Empirical

Levels reflected in theory were explicitly stated just over half of the time (54%, or 35/65). Concepts and measures were at the same level of analysis in 88% (57/65) of the articles. Though the levels reflected in data analysis seemed quite low (31%, or 20/65), many studies were at the individual level of analysis, or were at the group level of analysis with constructs appropriately aggregated to the group level. Therefore, no multi-level techniques were necessary in these two situations. Finally, appropriate alignment of theory and data was high (82%, or 53/65).

3.26. Vertical dyad linkage and individualized leadership

Vertical dyad linkage (VDL) theory was the first theory that proposed leaders treated subordinates differently. Leader–member exchange and individualized leadership are two approaches that emerged from VDL. Due to the extensive amount of research on and the different focus of LMX, leader–member exchange was given its own category. Additionally, whereas VDL was conceptualized as dyads within groups, individualized leadership proposes that leaders form relationships with subordinates, independent of all other subordinates. Thus the proposed level of analysis for individualized leadership was between dyads. VDL focuses on negotiating latitude whereas individualized leadership focuses on support for self-worth as important constructs in the relationships (Dansereau, 1995; Dansereau et al., 1995; Wallis, Yammarino, & Feyerherm, 2011).


The only conceptual article explicitly stated the levels of analysis in theory (100%, or 1/1).

3.26.2. Empirical

For empirical papers, again, all papers explicitly stated the levels of analysis in theory (100%, 3/3). This was the only category that explicitly stated the levels of analysis in theory for all papers. Levels reflected in measurement and alignment of theory and data were both at 67% (2/3). Use of a multi-level technique was evident in 33% (1/3) of the articles.

3.27. New methods and analytic techniques

This category includes research that discussed new methods and new analytical techniques in leadership. Such techniques and methods include within- and between-entity analysis (WABA; Markham & Halverson, 2002; Schriesheim, 1995; Yammarino, 1998), hierarchical linear modeling (Gavin & Hofmann, 2002; Ployhart, Holtz, & Bliese, 2002), qualitative research (Bryman, Stephens, & Campo, 1996; Conger, 1998), content analysis (Insch, Moore, & Murphy, 1997), grounded theory (Parry, 1998), measurement development or assessment (Tejeda, Scandura, & Pillai, 2001), levels of analysis (Schriesheim et al., 2001), model specification (Podsakoff, MacKenzie, Podsakoff, & Lee, 2003), simulation (Dionne & Dionne, 2008), causality and endogeneity (Antonakis, Bendahan, Jacquart, & Lalive, 2010), within group agreement (Biemann, Cole, & Voelpel, 2012), and historiometric methods (Ligon, Harris, & Hunter, 2012).

3.27.1. Conceptual

Explicit statement of levels of analysis in conceptual articles was 25% (3/12). The level of analysis in theory was indeterminate in 42% of the articles (5/12).

3.27.2. Empirical

Explicit statement of levels of analysis in empirical articles was 52% (12/23), while the level of analysis in theory was indeterminable about a quarter of the time (26%, or 6/23). The levels reflected in measurement and alignment of theory and data were both 78% (18/23). However, 39% (9/23) of the articles used a multi-level technique, which was higher than those of any other leadership categories.

3.28. Multiple theories

There were a few articles that could not be assigned to any one category, as they contained multiple theories or leadership categories. For instance, some articles did not differentiate between transformational and charismatic leadership, and as such, these articles could not be assigned to either the transformational or the charismatic category (Conger, 1999; Den Hartog, House, Hanges, Ruiz-Quintanilla, & Dorfman, 1999; Hunt, 1999; Yukl, 1999).

3.28.1. Conceptual

Explicit statement of levels of analysis in conceptual articles was 40% (2/5).
3.28.2. Empirical

Although there were only two empirical articles, neither explicitly stated the level of analysis in theory development (0%, or 0/2). The levels reflected in measurement and alignment of theory and data were both 100% (2/2), while neither used a multi-level data analysis technique (0%, or 0/2).

3.29. General

This category contained research that did not necessarily fit neatly into any of the other 28 categories, or reflected research that simply addressed leadership in general. For instance, Shamir (2011) discussed the importance of considering time when studying leadership. This article addressed leadership in general, and did not touch on any one particular theory or leadership topic.

3.29.1. Conceptual

Levels of analysis in theory were explicitly stated a modest 53% (10/19) of the time in conceptual articles.

3.29.2. Empirical

As evident in other leadership categories, there exist similar trends in regard to levels of analysis in theory, measurement, data analysis and alignment of theory and data for the general empirical articles. Level of analysis was explicitly stated in 40% (6/15) of the empirical articles. Levels reflected in measurement was high at 93% (14/15), and levels in alignment of theory and data also was high (87%, or 13/15). There were no multi-level techniques used in these articles (0%, or 0/15).

3.3. All approaches: summary across all 29 leadership categories

Results for the “All Approaches” category were achieved by computing a weighted average for achievement across all 29 leadership categories for each of the four levels assessments (i.e., theory, measurement, data analysis and alignment). Overall, the levels reflected in both measurement (81%, or 424/522) and alignment (78%, or 407/522) were high relative to the levels explicitly stated in theory for empirical (33%, or 174/522) and conceptual articles (37%, or 100/268). The levels reflected in data analysis were much lower (17%, or 88/522), however, as stated previously, many studies were conducted at the individual level of analysis or had constructs that were appropriately aggregated to a higher level of analysis. Therefore, no multi-level techniques were necessary in these circumstances. This accounts for most of the low incorporation of levels into data analysis.

![Diagram](image-url)
3.4. Comparison with results from Yammarino et al. (2005) review

Table 1 includes results for conceptual and empirical articles summed across all 17 categories in the Yammarino et al. (2005) state-of-the-science review of levels of analysis incorporation into leadership research. Their review included leadership research within various academic publication outlets, and contained about half as many articles (348) as the current review. Although a direct comparison is not particularly appropriately given Yammarino et al. (2005) examined only 17 of the more recognized leadership models and used data from a variety of publication outlets, nonetheless it does provide an interesting starting point to examine progress over time for levels of analysis incorporation into leadership research for both Leadership Quarterly and the overall field.

For conceptual leadership research covered in the Yammarino et al. (2005) review (i.e., 1995–2004), 37% (51/137) of all conceptual publications explicitly stated the level of analysis in theoretical development. This percentage is the exact same percentage for LQ’s history as well, where LQ had 100/268 (37%) conceptual articles explicitly state the level of analysis in theory development.

For empirical leadership research covered in the Yammarino et al. (2005) review (i.e., 1995–2004), 25% (53/211) of empirical publications explicitly stated the level of analysis in theory and hypotheses development. LQ’s history reveals a higher percentage of explicit levels specification in theory, achieving 33% (174/522) incorporation. LQ’s history of appropriate levels incorporation into measurement (81%, or 424/522) exceeds what the field was achieving during the Yammarino et al. (2005) review (111/211, or 53%). While use of multi-level techniques was low in both the Yammarino et al.’s (2005) review (15%, or 32/211) and the current review (17%, or 88/522), recall of the majority of leadership research has been at the individual level of analysis, and as such, no multi-level techniques are indicated. Finally, LQ’s history of appropriate alignment between theory and data (78%, or 407/522) exceeds what the field was achieving during the Yammarino et al. (2005) review (91/211, or 43%).

3.5. Levels of analysis trend over time at Leadership Quarterly

While an overall percentage helps indicate the “health” of levels of analysis in leadership research, another important issue is the trajectory of levels of analysis incorporation into leadership research. In light of increasing research in teams and groups and on organizational-level concepts, incorporation of levels of analysis into both theory and empirical testing has become more important than ever. As such, Fig. 1 plots the trajectory of levels of analysis incorporation into conceptual (theory) and empirical research throughout LQ’s history, reflected in five-year increments.

Examining theory incorporation by combining theoretical ratings from both conceptual and empirical articles, there is a generally positive increase in the explicit incorporation of levels of analysis into theory development for research published within LQ. The trend displays a generally positive increase over time, and has present-day incorporation levels at around 40%.

![Fig. 2. Percentage of behavioral theory LQ articles achieving levels-based standards in theory, measurement, analysis and alignment. Note. Conceptual articles were coded only for theory (n=5), while empirical articles were coded for theory, measurement, analysis and alignment (n=33). Theory plots reflect a combined conceptual and empirical sample (n=38).](image-url)
While appropriate measure and alignment of theory and data enjoy the highest achievement, Fig. 1 shows the difficulty, during the early 1990s, of transitioning from mostly individual-level research to increasing more complex higher-level and multi-level leadership research. After a period of decline in the early 1990s, LQ's achievement in these two areas has steadily increased, achieving standards above 80% in both categories. While use of multi-level data analytic techniques remains low, there has been a gradual increase over time.

While Fig. 1 shows the general trajectory in all leadership research within LQ, and shows generally increasing trends over time in theory, measurement, analysis and alignment, arriving at these summary statistics seems much less "clean" when individual categories are examined. For example, we plotted eight of the major (i.e., contain larger number of articles) leadership research categories (behavioral, charismatic, cognitive, collectivistic, executive, LMX, trait, and transformational) to examine how their trends in theory, measurement, analysis and alignment fared over time. Results, presented below, displayed a more varied achievement path over time in nearly all areas of theory, measurement, analysis and alignment, with conceptual and empirical articles theory ratings combined for viewing in the figures.

3.5.1. Behavioral theories

Fig. 2 indicates that behavioral leadership research has achieved the highest levels-based ratings in the areas of measurement and alignment, and displays a generally increasing trend since 2004, although this higher achievement may be indicative of a general focus on the individual level of analysis within this research. The individual-level focus also may explain a limited use of multi-level data analytic techniques; however, the individual-level focus does not explain a decreasing trend in specifying theory in both conceptual and empirical articles.

3.5.2. Charismatic theories

Fig. 3 indicates that after an initial decline in measurement and alignment following 1994, the next ten years showed some improvement in measurement but none in alignment. Then, following 2004, significant gains were made in both measurement and alignment, displaying that more recent charismatic research is enjoying achievement in measurement and alignment near 100%. While research indicates a steady increase in use of multi-level techniques since 1999, explicit theoretical levels incorporation in both conceptual and empirical articles has hovered near 30% for the past 13 years.

3.5.3. Cognitive theories

Fig. 4 displays somewhat similar trends as those indicated in behavioral research. While measurement and alignment enjoy high levels of achievement over time, this is likely related to the individual-level focus within this stream of research. Also like behavioral theories, there has been a decreasing trend in explicitly incorporating level of analysis into theory in both conceptual and empirical articles. Finally, likely due to the individual-level focus, there is little use of multi-level analytic techniques.

Note. Conceptual articles were coded only for theory (n=20), while empirical articles were coded for theory, measurement, analysis and alignment (n=43). Theory plots reflect a combined conceptual and empirical sample (n=63).

Fig. 3. Percentage of charismatic leadership LQ articles achieving levels-based standards in theory, measurement, analysis and alignment. Note. Conceptual articles were coded only for theory (n = 20), while empirical articles were coded for theory, measurement, analysis and alignment (n = 43). Theory plots reflect a combined conceptual and empirical sample (n = 63).
Fig. 4. Percentage of cognitive theory LQ articles achieving levels-based standards in theory, measurement, analysis and alignment. Note. Conceptual articles were coded only for theory (n = 15), while empirical articles were coded for theory, measurement, analysis and alignment (n = 29). Theory plots reflect a combined conceptual and empirical sample (n = 44).

3.5.4 Collectivistic theories
Fig. 5 shows that while empirical-based collectivistic research increased in popularity following 1999, levels-based measurement and alignment were generally achieved at a high percentage (greater than 80%), despite limited use of multi-level analytic tools. If all variables of interest reside at the same level of analysis (i.e., collective), then researchers may not need use of a multi-level analysis technique to achieve alignment. That may explain the fairly low usage rate over time. However, explicit levels-based theoretical incorporation is volatile, with wide swings in achievement. The most recent period (2010–2013)

Fig. 5. Percentage of collectivistic theory LQ articles achieving levels-based standards in theory, measurement, analysis and alignment. Note. Conceptual articles were coded only for theory (n = 17), while empirical articles were coded for theory, measurement, analysis and alignment (n = 25). Theory plots reflect a combined conceptual and empirical sample (n = 42).
3.5.5. Executive leadership

Fig. 6 indicates inconsistency in development of levels-based rigor within the executive leadership research category. While alignment has swung widely from high achievement in early executive research (i.e., during the 1990s) to low achievement during the early 2000s, levels-based measurement and alignment have come together since 2005 to higher achievement rates.
that continue on an increasing achievement trajectory. Levels-based theoretical achievement in conceptual and empirical research within the executive leadership category has varied widely over the years, and currently is substantially lower than achievement ratings during 2005 to 2009.

3.5.6. Leader–member exchange

Fig. 7 indicates LMX is one of the few major research categories with a substantial downward trend regarding achievement with levels-based measurement and alignment. Besides the downward trajectory, the most recent achievements in measurement and alignment reflect approximately 60% of research achieving standards, the lowest of any of the major category achievements by nearly 20%. Conversely, while measurement and alignment are decreasing, explicit levels-based theoretical incorporation in conceptual and empirical research is on the rise, with greater than 80% of articles explicitly specifying the level of interest in theory and hypotheses development. LMX enjoys the highest theory achievement rates of any of the major categories, and the use of multi-level data analytic techniques are on a positive trajectory as well.

3.5.7. Trait theories

Fig. 8 displays a trend similar to other individual-level focused research, where high achievement rates in measurement and alignment are present and likely due to the individual-level nature of the research. While explicit levels-based theory in conceptual and empirical articles is on the rise, use of multi-level data analytic techniques is achieving higher incorporation rates. While trait-based research is most likely focused on the individual, explicit levels-based specification occurs in less than 20% of all articles published in LQ.

3.5.8. Transformational leadership

Lastly, Fig. 9 displays levels-based trends from the most populous research area to occur within LQ, transformational leadership. After decreasing trends of measurement and alignment regarding transformational leadership during the 1990s, research has achieved levels-based measurement and alignment rates near 100% in recent times. During the period between 1995 and 1999, while measurement and alignment achievement were at their lowest (near 30%), use of multi-level analytic techniques in transformational research were at their peak, with nearly 70% of all transformational articles published within LQ employing some multi-level analytic technique. While use of multi-level analytic techniques declined sharply following 1999, they are once again on the rise, although usage rates are around 30%. Levels-based theoretical achievement has fallen slightly in recent years for conceptual and empirical articles, although at nearly 50% currently, only LMX theoretical incorporation enjoys higher achievement rates.

![Graph](image)

**Note.** Conceptual articles were coded only for theory (n = 19), while empirical articles were coded for theory, measurement, analysis and alignment (n = 44). Theory plots reflect a combined conceptual and empirical sample (n = 63).

**Fig. 8.** Percentage of trait theory LQ articles achieving levels-based standards in theory, measurement, analysis and alignment. Note. Conceptual articles were coded only for theory (n = 19), while empirical articles were coded for theory, measurement, analysis and alignment (n = 44). Theory plots reflect a combined conceptual and empirical sample (n = 63).
4. Discussion

Results of the 25-year levels of analysis assessment reveal some hopeful trends regarding incorporation of levels-based theory, measurement, and analytics for alignment purposes within leadership research. However, before celebrating the success of the field, there is great room across all areas for improvement of the increasing trends. We briefly summarize levels-based classification categories in the following section, then identify some of the more “levels-based progressive” leadership research areas, and finally, consider how to continue improving leadership research by incorporating a levels-based framework into both conceptual and empirical research.

4.1. Levels reflected in theory and hypotheses development

While we see a generally increasing trend among both conceptual and empirical research to specifically and explicitly declare the appropriate level of analysis for variables/constructs of interest, data revealed that throughout LQ’s history, less than 40% of conceptual (37%) and empirical papers (33%) explicitly specified the appropriate level of analysis. While the empirical rate of 33% indicates that historically LQ has had higher instances of level-specific theory in empirical research (Yammarino et al., 2005 rate for empirical publications was 25%), this number remains too low for the field, considering “theory without levels of analysis is incomplete; data without levels of analysis is incomprehensible” (Yammarino et al., 2005, p. 904). Conceptual leadership research is only slightly better at identifying the appropriate level of analysis in theory (37%), therefore leaving great room for improvement in conceptual research as well.

The low theoretical specification number may be related to the notion that since much of early leadership research was individual-level research (e.g., trait, behavioral, influence tactics), the appropriate level of analysis was “implied” and/or “understood” to be the individual level. Interestingly, many of the categorizations in this review that scored highest in explicit specification of level of analysis in theory and hypotheses (greater than 50% specification) were categories where the “implied” level shifted higher (i.e., team and group leadership, LMX, VDL and individualized, executive, collectivistic), and/or categories where newer areas of leadership research were represented (i.e., spiritual, emotions, and charismatic–ideological–pragmatic). Additionally, empirical transformational leadership, which reflected the most populous categorization, also achieved a greater than 50% specification of levels of analysis in theory and hypotheses.

Thus, the best hope for explicit specification of levels of analysis into theory and hypotheses development has been when the “implied” individual level of analysis that surrounds historic research has been shifted to a higher level of analysis, or when researchers have introduced a new leadership model. Even then, no categorization other than VDL and individualized leadership achieved perfect specification of levels of analysis in theory and hypotheses development. In a perfect world, all leadership research would frame their levels of analysis assumptions within theory development to help other researchers confirm underlying and or implied level issues.
Individual-based independent variables influencing individually-relevant dependent outcomes represent clear individual-level research. This is an easy statement to assert within theoretical development, even when the implied level is clearly individual. However, with more and more contextual moderation tests and interest in outcomes that may not be clearly individual-level dependent variables, the efficacy of leadership research can be greatly enhanced by theoretically clarifying what the appropriate level(s) of analysis may be, and developing hypotheses in such a way as to alert the reader to the complexity of the levels issues.

The future of leadership research rests on better specification of appropriate levels of analysis within theoretical development. It is simple to insert an explicit level specification, if the research is “implied” individual-level research and straightforward. If the research is at a higher level, or involves multiple levels, which is arguably less simple, then it is necessary to insert and discuss explicit levels of analysis assumptions. Yammarino and Dansereau (2011) recently discussed the importance of going beyond implied levels of analyses as means of advancing research:

“Theoretical revolutions in science often occur when other levels of analysis are considered. For example, a revolution in biology occurred when some scholars suggested, and subsequently demonstrated, that evolution can occur at a level of analysis higher than that of the organism level (see Gould, 2002; Wilson, 1980, 2002). A well-known revolution in physics occurred when some scholars asserted, and subsequently demonstrated, that quantum mechanics operates at a level of analysis lower than that of the atomic level (see Wolfram, 2002). Likewise, we can advance OSL (Organizational Science and Leadership) theory building and theory testing by including lower and higher levels of analysis in theory development and hypothesis generation, measurement, data analysis, and inference drawing.” (Yammarino & Dansereau, 2011, p. 1045).

However, in tandem with examining higher and lower levels of analyses in theory development, researchers have to explicitly specify the initial focal level of interest. With only approximately one-third of Leadership Quarterly’s research attaining this minimum standard, the field has significant room for improvement in the coming years.

4.2. Levels reflected in measurement

Results show the most impressive achievements reside within this assessment area. Again, while the Yammarino et al. (2005) review used data from all journals and book chapters which provides a comparison point (of sorts) among publication outlets, research in Leadership Quarterly was clearly ahead of other outlets. Comparing results from 1990 to 2004 regarding levels reflected in measurement on Fig. 1 clearly showed Leadership Quarterly research was exceeding the overall rate of the field (53%) from Yammarino et al. (2005), with an average rate somewhere around 75%. In the years since the Yammarino et al. (2005) review was published, LQ research continued to appropriately reflect levels of analysis in measurement, improving to an average rate exceeding 80%. For all research published in the 25-year history of the Leadership Quarterly, the rate of appropriate levels of analysis reflected in measurement is 81%.

Because most leadership research was conducted at the individual level of analysis, this high achievement rate may not be as impressive as the numbers appear. However, the silver lining revealed in the data is that newer leadership research and/or leadership research that reflects levels of analysis higher than those of the individual achieve appropriate levels-based measurement with large success: authentic leadership (86%), leadership emergence (100%), ethical leadership (82%), and collectivist theories (92%). Thus, while in large part, success within this assessment area can be contributed to individual theories and measures, when the field has expanded beyond individual theory and/or introduced new theory, the level-specific measurement success rates tended to remain quite high. In other words, even when levels of analyses exceed the individual level, Leadership Quarterly research achieved a higher standard in appropriate levels-based measurement than leadership research in other outlets within the field, at least up until 2005. However, as Leadership Quarterly’s numbers continue to improve within this domain, it is likely they remain a strong leader in levels-appropriate measurement.

4.3. Levels reflected in data analysis

Results within this domain might appear at first glance to be exceedingly low (17%), however, recall a majority of leadership research was conducted at the individual level of analysis. As such, individual level research did not require use of a multi-level technique, and therefore receives no credit in this area. For example, in the Cognitive Theory category, most of the research was conducted at the individual level of analysis (at least 86% of the research), and therefore a multi-level data analysis technique usage score of 0% is not surprising. Additionally, even when a higher level of analysis is the appropriate focal entity, as in the Collective Leadership category for example, if all variables are measured at a single (and appropriate) level of analysis and/or aggregated appropriately to a single level of analysis, a multi-level data analysis technique may not be indicated (i.e., having all measures at the collective level could proceed with, for example, a single-level basic regression technique).

However, what remains troubling is that multi-level data analysis techniques were not used when indicated, which is reflected in examining results in both this analytic category and the subsequent alignment category. For example, research in a category such as Leadership in Teams and Groups employed a multi-level technique in 25% of the studies, but the alignment between theory and data was only 50%. Unfortunately, this indicates there were requirements for multi-level data techniques among this research that were not addressed appropriately. Similar problems can be found within in the categories of Spiritual Leadership, Culture and Diversity, and LMX. Again, theories in these categories likely reflect more complex levels-based issues, and as such, the lower scores within these areas are less surprising, although they indicate room for improvement in levels-based measurement technique.
As a comparison point, Fig. 1 indicates a steady improvement over time in use of multi-level techniques within the pages of Leadership Quarterly throughout the 25-year history. However, using the Yammarino et al. (2005) review as a reflection of the multi-outlet field of leadership research, the rate of achievement within Leadership Quarterly (17%) seems to mirror the overall rate in other outlets (15%), at least up until 2005. Clearly, as leadership research moves away from individual-level only research into more complicated higher-level or multi-level contextual research, the field needs to improve its use of appropriate multi-level data analytic techniques to assess more complex data.

4.4. Alignment of theory and data

For empirical articles, this is the category that is most telling. In other words, when theory development, measurement and data analysis all come together, is the level of analysis appropriately reflected in the final outcomes? Alignment is importantly related to confidence and efficacy surrounding research conclusions. Without alignment between theory and data, it is nearly impossible to be confident that constructs and relationships operate as proposed.

Again, because most of the leadership research coded was at the individual level of analysis, this number is fairly high (78%). The more telling information is found in categories where more levels-based complexity was present, such as dyadic, group and collectivistic categories, or where contextual factors may play a role. Not surprising, these categories represented some of the lowest alignment rates among the 29 categories (e.g., Leadership and Groups and Teams 50%; LMX 59%; Culture and Diversity 59%; Substitutes for Leadership 60%; Leadership for Creativity and Innovation 62%; Follower-centric Theories 64%; VDL and Individualized Leadership 67%).

Some good news related to the Yammarino et al. (2005) review, examining LQ articles from the period of 1990–2004, alignment rates ran fairly high for leadership research published within the pages of Leadership Quarterly (approximately 70%). Assessing 17 models within leadership research in multiple outlets, including research within Leadership Quarterly, the rate for alignment in 2005 was 43% (Yammarino et al., 2005). Although the categories are not directly comparable, it does appear that research in Leadership Quarterly likely significantly pulled the levels-based alignment achievement up for the entire leadership field.

Thus, the practice of considering levels of analysis within both submissions and reviews over the 25-year history of Leadership Quarterly has provided significantly greater efficacy in levels-based alignment between theory and data among leadership research, at least up until 2005. However since 2005, the alignment rate has steadily risen at Leadership Quarterly, which likely keeps LQ as a “leader” in this achievement.

4.5. Progressive research areas

While we highlighted some strengths and weaknesses of particular leadership categories within the four assessment areas of theory, measurement, analysis and alignment, we also highlight categories that appear to be better at incorporating a levels-based framework into research relative to the other categories. Or, in other words, are any categories more “progressive” in their levels-based development? Some minimum requirements to be considered “progressive empirical” would mean theory and hypotheses have explicit incorporation of levels, measurement is executed at the appropriate level, and there exists a good alignment achievement rate. Elimination of the multi-level data analysis assessment for empirical research enables individual-level theories to score as “progressive,” as they may not use multi-level techniques. For “progressive empirical” we set an arbitrary minimum standard of achieving a 50% rating in the following three assessments areas: theory, measurement, and alignment. For “progressive conceptual” we set an arbitrary minimum standard of achieving a 50% rating in the sole assessment area: theory.

4.5.1. Empirical

Leadership categories that scored 50% or higher in all three areas of theory, measurement and alignment included Transformational Leadership, LMX, Spiritual Leadership, VDL and Individualized Leadership, Leadership in Teams and Groups, and New Methods and Analyses Techniques. Of these six leadership categories, VDL and Individualized Leadership had the best average assessment rating (78%) when averaging across all three level assessment categories, while Transformational Leadership follows close behind with an average levels’ assessment rating of 75%. As the Transformational Leadership category has significantly more empirical research within LQ, this is a particularly impressive achievement.

Thus, most of the leadership categories (23/29 categories) of empirical leadership research published in LQ could not meet a “progressive” standard where half of the published research had appropriate specification of theory and hypotheses, employed appropriate levels-based measurement and produced appropriate levels-based theory and data alignment. That means more than 75% of the research (393/522 empirical articles) published in LQ have significant room for improvement regarding specification of levels in theory, appropriate use of levels-based measures and producing appropriate theory-data alignment. And, as 50% represents a fairly low bar for standards, seemingly all research categories, even progressive ones, need better incorporation of a levels-based framework within their studies.

4.5.2. Conceptual

Within the conceptual research published in LQ over the past 25 years, ten of the 29 categories achieved a rating of higher than 50% with regard to explicit specification of level of analysis in theory development: LMX, Collectivistic, Power and Influence, CIP Model, Contingency Theories, Executive Leadership, VDL and Individualistic Leadership, Emotions, Leadership in Teams and
Groups and General approaches. Although CIP Model and VDL and Individualistic Leadership each scored a rating of 100%, there was only a single study within each category. Collectivistic Theories rated 71% of their studies as explicitly specifying the focal level of analysis.

Similar to the “progressive empirical” achievement, most leadership categories (19/29) of conceptual leadership research published in LQ could not meet a “progressive” standard where half of the published research had appropriate levels specification of theory and propositions. That means more than 68% of the research (183/268 conceptual articles) published in LQ have significant room for improvement regarding specification of levels in theory. And, as noted prior regarding empirical research, even progressive categories could better incorporate a levels-based framework within their theoretical development, as we employed a fairly low bar for the definition of “progressive” (i.e., 50% of articles had appropriate levels specification in theory).

4.6. Leadership Quarterly as the leader in levels of analysis research

This levels-of-analysis review of the population of leadership research published in LQ may be an indication of achievement with regard to levels of analysis in the larger field of leadership. At least up until 2005, leadership research published within LQ had more appropriate levels-based measurement and better theory data alignment than leadership research published in other outlets (including journals and books). And, as those achievements have continued on an upward trajectory, it is likely Leadership Quarterly remains a leader in the field with regard to expectations about appropriate measurement and theory-data alignment.

The large difference in achievement level in these two levels’ assessment areas between other research outlets and research published in LQ is likely related to the presence of levels of analysis scholars on the editorial board throughout Leadership Quarterly’s 25-year history. The encouragement of authors and reviewers to consider the implications of levels of analysis within leadership research submitted to Leadership Quarterly has provided the journal with a prestigious levels-based tradition. From nearly its inception, Leadership Quarterly was asking leadership scholars to use a levels-based lens when framing leadership research.

To remain a levels-of-analysis leader among academic publications, Leadership Quarterly needs to continue the strong emphasis on measurement and alignment, while encouraging a stronger emphasis on explicit statements regarding the appropriate theoretical level of analyses of all constructs of interest. This levels-based theoretical emphasis needs to be encouraged in both conceptual and empirical articles and represents one form of testable boundary conditions. Yammarino et al. (2005) suggested four specific actions to improve this assessment area, and all remain relevant today. They are listed again, verbatim, to reiterate the importance of developing good levels-based theory as a starting point to good levels-based research (Yammarino et al., 2005, p. 905):

1. Define the level of analysis of the unit(s) of interest, i.e., the entity (entities) to which theoretical generalizations apply.
2. Define the level of analysis of the associated concepts, constructs, variables and relationships.
3. Provide a theoretical justification for everything included in #1 and #2 above.
4. Specify the boundary conditions, including and based upon levels of analysis, for everything in #1, #2 and #3 above.

Increasing the use of multi-level data analytic techniques will depend on theoretical and hypotheses development. While data at a single level of analysis, especially the individual level of analysis, does not require multi-level techniques, organizational research is becoming more focused on higher levels of analyses and contextual relationships within models (Scandura & Williams, 2000). Presumably, leadership research follows that trend, as evidenced by research in teams and groups, collectives, culture and diversity, and contextual relationships. As such, our expectations are that Leadership Quarterly will begin to see an increase in multi-level data analytic techniques as theories and models continue to become more complex related to focal levels of analyses. To maintain the strong tradition as leader in levels-based research, Leadership Quarterly needs to ensure methods are appropriate and rigorous enough to meet the challenges of multi-level investigation.

4.7. Limitations

While comprehensive in nature, this review study has recognized limitations. First, although coding of articles was reliable, the coding scheme itself is based on subjective judgments of leadership theory categorization to facilitate comparisons. For example, we included entrepreneurial leadership under the collectivistic theories category due to the context of research and type of variables among the entrepreneurial studies. However, a different set of researchers could subjectively place entrepreneurial articles under some other categorization schemes. We attempted to mitigate the effects of categorization judgments by detailed coding of variables within the study, study context, and multiple teams of coders assessing and ultimately agreeing on placement of articles within categories.

Additionally, some theory classifications such as transformational leadership research and the charismatic–ideological–pragmatic model contain a charismatic component and therefore could be classified as charismatic. Again, the nature of theory is that some overlap exists, but again, when coding articles we attempted to distinguish the main focal theories and categorize as appropriate. However, we recognize that some results for transformational and CIP categories may be due to embedded charismatic measures.
4.8 Future directions

Leadership research is more complex than ever. New research looks at teams, teams within teams, teams within networks, networks within organizations, collectives, and host of other contextual factors. What is the appropriate level of analysis of these new approaches? The answers are complicated, yet likely lie within understanding various leadership paradigms and boundary conditions, the unique implications of multi-level entities, and the ability to assess these leadership relationships within dynamic environments.

For example, research within the field of networks assumes networks are static (Brass, Galaskiewicz, Greve, & Tsai, 2004; Dionne, Akaishi, et al., 2012), and has not considered the role of time in social networks. As such, longitudinal research is needed for exploring changes in interaction patterns (Balkundi & Harrison, 2006; Brass, 1984; Mehra et al., 2006; Yammarino et al., 2012). Additionally, in terms of levels of analysis, most empirical studies on networks have analyzed constructs and relationships at the individual- and team-level and have not incorporated a network level of analysis into their research. Yammarino et al. (2012) recommend that future studies introduce a network level into this research stream, begin exploring relationships at multiple levels, and also look at multi-level interactions between and/or within individuals and collectives.

Regarding analytic methodology, future research has the potential to inform leadership researchers about commonly used analytic techniques by coding use (and appropriateness of use) of multi-level techniques such as WABA and RCM/HLM as well as other approaches. Understanding which tools the leadership field uses to assess appropriate levels of analysis within research can only strengthen our understanding of how to address the increasing complexity of leader-follower interactions in groups, teams and collectives.

Another area for future research concerns the notion that most multi-level research is built upon the assumption that organizations have nested structures and that one must designate a focal unit of analysis. Formal organizational levels (e.g., work teams, departments) are primarily used as focal levels of analysis to formulate level-specific theories and direct data collection and analysis (Short, Payne, & Ketchen, 2008). However, as organizations become more organic and flexible, the boundaries between formal units become ambiguous and arbitrary (Hackman, 2003; Mathieu & Chen, 2011). In the face of such ambiguity, traditional and/or formal organizational levels may not necessarily be the appropriate levels of analysis for multi-level leadership research.

In addition, traditional levels of analysis are distributed on a discrete scale (i.e., individual level, dyad, group, and collective level). This discrete view may produce difficulty when examining organizational and leadership phenomena which involve complex and fluid memberships. Future research can complement the current multi-level research by examining levels of analysis on a continuum. In so doing, the specific structure of entities being examined can be better represented and analyzed with more accuracy and rigor.

Finally, research on the collective level has been rare until recent years due to the difficulty involved with gathering data from a collective. Collectives are a clustering of individuals larger than a group and can be represented as a department, organization, or even an industry (Yammarino & Dansereau, 2011). Due to their size and the number of collectives that one would need in an empirical study, assembling data for a collective is a massive undertaking. Recently, collecting large amounts of data has been facilitated by the internet and big data sources (Dionne, Akaishi, et al., 2012). Researchers can now directly access data that is already collected and stored, which greatly minimizes the time necessary to collect data. With the increased availability of these large data sources and the increasing awareness of levels of analysis we can certainly expect an increase in the number of leadership studies examining leader impacts or effects on collectives.

5. Conclusion

Thus, with an increase in the complexity of organizational science especially as it relates to higher and more complex multi-level relations, leadership research must be prepared to conduct research within a multi-level framework. This review revealed that Leadership Quarterly has paced the leadership field in the past with regard to levels incorporation into research. By emphasizing levels of analysis from its inception, LQ has positioned leadership research to lead organizational research in multi-level theory and data analysis advancements. Leadership research has been at the cutting edge of methodological advancements (Yammarino, 2012), and with Leadership Quarterly’s continued help, the leadership field can model and improve levels-based theoretical development and continue to provide a strong example of level-specific methodological advancement.

References


References include only those articles cited within the text of the current article. References for all coded articles are available by request from the first author.


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