



Multi-level issues in evolutionary theory, organization science, and leadership[☆]

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ABSTRACT

Multi-level issues are critical in the physical, social, and behavioral sciences. We articulate issues related to multiple levels of analysis in theory building and theory testing and explore them from evolutionary theory (ET) and organization science and leadership (OSL) perspectives. Specifically, analogous multi-level concepts and notions in ET and OSL are identified, aligned, and illustrated. Ideas from evolutionary psychology are included in the ET perspective, while notions from the varient approach are included in the OSL perspective. Several exemplars in OSL that incorporate ET and multi-level perspectives are presented. Numerous examples and lessons learned from ET and implications of multi-level issues and multiple levels of analysis for future theory building and theory testing in OSL are discussed as well.

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1. Introduction

Multi-level issues, or multiple levels of analysis in both theory building and theory testing, are critical in research in the physical, social, and behavioral sciences (see Dansereau & Yammarino, 2003, 2005, 2007; Dansereau, Yammarino, & Kohles, 1999; Futuyma, 2005; Gould, 2002; Klein & Kozlowski, 2000; Miller, 1978; Rousseau, 1985; Wilson, 1980, 2002; Wolfram, 2002; Yammarino & Dansereau, 2002, 2004, 2006, 2008, Yammarino & Dansereau, 2009a, 2009b). Work on multi-level issues in organization science and leadership (OSL) (e.g., Anderson, 1999; Dansereau, Alutto, & Yammarino, 1984; Dansereau, Cho, & Yammarino, 2006; Dansereau & Yammarino, 1998a, 1998b, 2003, 2007; Dansereau, Yammarino, & Markham, 1995a, 1995b, Dansereau et al., 1995b; Dansereau et al., 1999; DeChurch, Hiller, Murase, Doty, & Salas, 2010; Gupta, Tesluk, & Taylor, 2007; Klein & Kozlowski, 2000; Markham, 2010; Meyer, Gaba, & Colwell, 2005; Mumford, Hunter, & Bedell-Avers, 2008; Peterson, 1998; Rousseau, 1985; Yammarino & Dansereau, 2002, 2004, 2008, 2009a, 2009b; Yammarino, Dionne, Chun, & Dansereau, 2005) has been influenced by research on levels of analysis from other scientific fields (e.g., Gould, 2002; Miller, 1978; Wolfram, 2002). In particular, evolutionary theory (ET) (Darwin, 1859, 1871; Dawkins, 1976; Futuyma, 2005; Galton, 1869; Gould, 2002; Sober & Wilson, 1998; Wilson, 1980, 2002), a comprehensive, well-established interdisciplinary theory, can provide important insights for organization science and leadership on multi-level issues.

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While there have been attempts to infuse evolutionary theory ideas into the field of organization science and leadership (e.g., Kniffin, 2009; Kniffin & Wilson, 2010; Luxen & Van De Vijer, 2006; Markoczy & Goldberg, 1998; Nicholson, 1997, 2008; Nicholson & White, 2006; Pierce & White, 1999, 2006; Van Vugt, Hogan, & Kaiser, 2008), this prior work has primarily focused on variables and some processes and has typically ignored levels of analysis issues. Multi-level issues in ET offer insights regarding those same issues in OSL. As such, via an alignment, discussion, and illustration of analogous multi-level notions from ET and OSL, we hope to enhance the transfer or translation of knowledge on these topics from a mature and established field of work (ET) to a newer and developing one (OSL). Simply, knowledge of the use of multi-level notions in ET can facilitate the understanding of their use in OSL, providing lessons learned, and thus enhance multi-level theory building and theory testing in the latter field of study.

Thus, our purpose here is to identify, explore, and align a set of multi-level issues from the different disciplinary perspectives of ET and OSL. Multi-level concepts from evolutionary psychology (e.g., de Waal, 2002; Nicholson, 1997, 2008; Nicholson & White, 2006; Pierce & White, 1999, 2006; Sober & Wilson, 1998) are included in the ET perspective, while notions from the variant approach (e.g., Dansereau et al., 1984, 1999, 2006; Yammarino & Dansereau, 2009a) are included in the OSL perspective, to provide additional insights on multi-level issues and facilitate the transfer or translation of learning from one field to the other.

The key multi-level concepts and issues of focus are summarized in Table 1. For each of these prominent multi-level ideas, as shown in the table, a direct alignment can be established between evolutionary theory and organization science and leadership perspectives. After an articulation of primary notions in evolutionary theory and the subfield of evolutionary psychology, these multi-level issues in ET and OSL are explicated and illustrated in subsequent sections (organized around Table 1). Implications and examples for a better understanding of multi-level issues, including multiple levels of analysis in theory building and theory testing, in organization science and leadership are then discussed.

2. Evolutionary theory

2.1. Fundamental notions

Evolutionary theory is supported by literally thousands of research studies from all areas of biology (e.g., botany, genetics, molecular biology, and zoology) and numerous other fields (e.g., anthropology, archeology, ecology, economics, and sociology). The key ideas and concepts from ET have been very well developed (see Darwin, 1859, 1871; Dawkins, 1976; Futuyma, 2005; Galton, 1869; Gould, 2002; Nicholson, 1997, 2008; Nicholson & White, 2006; Sober & Wilson, 1998; Wilson, 1980, 2002) and can be summarized here.

Table 1
Multi-level issues in evolutionary theory, organization science, and leadership.

Multi-level issue/concept	Evolutionary theory	Organization science and leadership
Levels of analysis (entities)	Genes, cells, organisms, demes, species, clades	Persons, dyads, groups, organizations, strategic groups, industries
Units of analysis (perspectives on entities)	Organism level	Person level
Wholes (homogeneity)	Organism	Person
Parts (heterogeneity)	Gene, cell	Gene, behavior
Collective (higher level)	Deme, species	Dyad, group
Adjacent (multiple) levels (multi-level effects)	Interact in synergy, orthogonally, or in opposition (homology, reductionism, and emergent properties; multi-level selection theory)	Interact in alignment, misalignment, or opposition (cross-level, level-specific, and emergent effects; multi-level and meso theories)
Level or entity changes over time	Selection, drift, and drives (Lamarckism, anagenesis, cladogenesis, punctuated equilibrium, catastrophic mass extinction, mutation pressure, directional speciation)	Stability of wholes, parts, and lower level; emergent, level ends, transformation up or down, level change up or down
Fallacies		
Ecological	Organisms are not just disaggregated species	Persons are not just disaggregated groups/organizations
Individualistic	Species not just aggregated organisms	Groups/organizations are not just aggregated persons
False dichotomies	Individual–environment Nature–nurture Free will–determinism	Individual–environment Person–situation Gene–learning and development
Analytical tools	Preserved results analysis, frequency analysis, heritability (h^2), and dynamic computational modeling and simulation to assess variation within and between organisms, species, etc.	Multi-level analysis (RCM, HLM, MLSEM, WABA), heritability (h^2), and dynamic computational modeling and simulation to assess differences within and between persons, groups, etc.

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