



Shared leadership in project teams: An integrative multi-level conceptual model and research agenda

Christina M. Scott-Young^{b,*}, Maged Georgy^{a,b}, Andrew Grisinger^b

Faculty of Engineering, Cairo University, 12613, Giza, Egypt
RMIT University, GPO Box 2476, Melbourne 3001, Australia

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Abstract

Shared leadership has rarely been studied in the project management context, despite its proven performance-enhancing benefits in other management domains. Based on a systematic review of the salient literature from multiple disciplines, this paper develops a new multi-level conceptual model to advance a holistic understanding of how shared leadership develops and how it may impact individual, team, project and wider organisational performance. The conceptual model draws upon the input-mediator-output-input perspective of systems theory, which is well-established in the general team literature. The new integrative model identifies the potential multi-level antecedents, proximal team functioning outcomes, and the more distal multi-level outcomes of shared leadership based on findings from the shared leadership literature drawn largely from other domains. Potential boundary conditions of the model are identified. A future research agenda is recommended for empirically testing the new multi-level shared leadership model and its different elements in a diverse range of project contexts.

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1. Introduction

Today's workplace is becoming increasingly project-centric (Schooper et al., 2018) with projects growing more complex (Bjorvatn and Wald, 2018) and requiring the use of many different team types, including multidisciplinary teams (Scott-Young and Samson, 2008), multiple teams (Gemünden et al., 2018), and sometimes inter-firm teams (Von Danwitz, 2018) to efficiently deliver project objectives. Often these project teams are co-located, but some teams work virtually and are dispersed across time and geographical zones, presenting additional challenges for coordination (Muethel and Hoegl, 2016). It is rare that any single individual will possess all the knowledge and skills necessary to direct or carry the entire project team's

performance (Pearce and Manz, 2005). Effective integrated project teams collaborate to make full use of members' diverse expertise and contributions (Scott-Young and Samson, 2008), and are able to draw upon the leadership of more than one person to manage and coordinate different tasks (Muethel and Hoegl, 2016). Modern organisations are now recognising that every person is a leader in his or her own sphere (Singh and Jampel, 2010) and that shared leadership (SL) is a valuable mechanism for managing complex environments (Sweeney et al., 2019). This represents a paradigm shift from vertical, individual leadership to horizontal, collective leadership (Cullen-Lester and Yammarino, 2016). Until Müller et al.'s (2017, 2018a, 2018b) recent work on 'balanced leadership' (a combination of horizontal and vertical leadership), the project management literature has focused mainly on vertical power centralised in a single person, i.e., a project manager endowed

* Corresponding author.

E-mail addresses: christina.scott-young@rmit.edu.au (C.M. Scott-Young), maged.georgy@rmit.edu.au (M. Georgy).

with formal authority to lead the project (e.g., [Aga et al., 2016](#); [Müller and Turner, 2007](#); [Zhang et al., 2018](#)).

The concept of participatory or empowered leadership, where leadership roles are shared among team members has been gaining increasing attention from both scholars and practitioners in multiple disciplines like management, health and education, where teamwork is a common work practice ([Contractor et al., 2012](#); [Gupta et al., 2010](#); [Ramthun and Matkin, 2012](#)). SL is based on the premise that leadership is essentially a role and sets of behaviours, rather than a particular person ([Lord et al., 2017](#)). The SL role can be distributed among different team members at different points of time ([Wang et al., 2014](#)). Despite the presence of a formal project leader, in SL more than one employee in a team may assume, in different moments, leadership behaviours, and may be viewed by team members as ‘leaders’ ([Pearce and Manz, 2005](#)). Capable members of the team are able to take on the accountability for leadership when required ([Sweeney et al., 2019](#)). Studies have found that SL produces superior team performance to vertical leadership alone ([D’Innocenzo et al., 2016](#); [Nicolaidis et al., 2014](#)). Pooled leadership expertise broadens the available knowledge resources, increases capacity, and distributes the workload more evenly ([Crevani et al., 2007](#)), thereby improving team productivity ([Sousa and Dierendonck, 2016](#)).

2. Research needs and study objectives

As SL is a relatively new area of leadership research ([Nicolaidis et al., 2014](#)), the body of knowledge is spread across various domains ([Kozlowski et al., 2016](#)). Most studies occur within the literatures of management and organisational behaviour ([Carson et al., 2007](#); [Ensley et al., 2006](#)), psychology ([Bergman et al., 2012](#); [Drescher et al., 2014](#)), healthcare ([Konu and Viitanen, 2008](#); [Steinert et al., 2006](#)), and education ([Bolden, 2011](#)). Many of these studies have been conducted on short-term student teams (e.g., [Erez et al., 2002](#); [Lee et al., 2015](#); [Mathieu et al., 2015](#)), raising questions about the generalisability of findings to the workplace.

Although compared to other fields of leadership research, studies of SL are limited and under-developed ([Lord et al., 2017](#)), in the project management field, research on SL is less frequent and knowledge is even more poorly developed ([Muethel and Hoegl, 2016](#)). Despite the known need for cooperation within project teams ([Scott-Young and Samson, 2008](#)) and the growing examples of the benefits of SL in other team types, there has been limited research on SL in project management. Several notable exceptions are studies that have been conducted with a variety of project teams, including globally distributed new product development teams ([Muethel and Hoegl, 2013](#)), a defence acquisitions project team ([Novikov, 2016](#)), engineering design teams ([Wu and Cormican, 2016](#)), information systems development teams ([Hsu et al., 2017](#)), and student project teams ([Aubé et al., 2018](#)). Each of these project studies has demonstrated that SL produces positive performance benefits.

Although interest in SL has increased in most disciplines over the past twenty years, our understanding of “how to conceptualise, measure, and indeed practice what constitutes shared leadership is at best rudimentary” ([Lord et al., 2017](#),

p. 445). Research on SL in all disciplines is still very much in its nascent stage and existing studies are characterised by a multitude of theoretical approaches ([Fitzsimons et al., 2011](#); [Kozlowski et al., 2016](#)). Our review of the extant SL literature revealed a number of recommendations by SL researchers for moving the field forward. First, due to the way SL leadership research has been fragmented across disciplines, the lack of conceptual clarity around SL needs to be addressed ([Avolio et al., 2009](#); [Kozlowski et al., 2016](#)). Second, further work is needed in developing a theoretical framework for studying SL at a more sophisticated level. [Nicolaidis et al. \(2014\)](#) and [Kozlowski et al. \(2016\)](#) recommend the adoption of the Input-Mediator-Output-Input (I-M-O-I) systems framework developed for the study of team functioning by [Ilgen et al. \(2005\)](#) and which has been further refined by [Mathieu et al. \(2008\)](#). Third, researchers emphasise the need to specify the boundary conditions of SL by identifying potential moderators of SL relationships ([Antonakis et al., 2012](#); [Nicolaidis et al., 2014](#)). Fourth, [Nicolaidis et al. \(2014\)](#) advocate for greater exploration of the mediating variables that transfer the effects of SL to team outcomes. Such mediators may include emergent states such as team cognition, team trust, and cohesion, as well as emergent team processes, such as interpersonal interactions and behaviours like communication, conflict resolution, and decision-making. Fifth, many researchers agree that future models of SL should adopt a multi-level conceptualisation, specifying variables at the individual, team, and organisational levels of analysis ([Batistič et al., 2017](#); [DeRue, 2011](#)). Sixth, while previous SL research has focussed primarily on team performance as an outcome, [Nicolaidis et al. \(2014\)](#) recommend that future research should explore other multi-dimensional aspects of performance (psychological, social, technical, and business).

These new directions for SL research emerge mainly from the management and organisational behaviour disciplines. As SL is an important new practice for decision making teams ([Steinheider and Wuestewald, 2008](#)), and is especially effective in tasks that are complex, dynamic, interdependent and knowledge intensive ([Klein et al., 2006](#)), this leadership practice holds great promise for project-centric work and warrants further study. Moreover, recently leading project management researchers have argued for the exploration of other forms of leadership that could offer a viable alternative to the traditional vertical project manager structure ([Müller et al., 2017, 2018a, b](#)). Therefore, this study answers the recent calls to explore different types of project leadership, by focusing on SL. This study also addresses an identified need for more research on employee participation ([Keegan et al., 2018](#)) - a key feature of SL ([Pearce and Manz, 2005](#)) - and its impact on multi-level outcomes. By addressing the above identified conceptual and theoretical issues, this paper will extend both the project management and general leadership literatures. Primarily though, this paper aims to stimulate further study of SL in the project context by addressing the following objectives:

1. to create an integrative working definition of SL in project teams;

2. to develop a new multi-level conceptual model of SL located in the project management context;
3. to propose an agenda for future research on SL in project teams.

3. Methodology

Denyer et al. (2008) argue that the systematic literature review and synthesis method is particularly suitable when knowledge is fragmented across disciplines, as is the case with SL research. This method provides an evidence-based approach to the identification of transferable knowledge from existing studies to inform both scholarship and practice (Briner and Denyer, 2012), which is the intent of the current study. Following the example of other project management researchers (e.g., Von Danwitz, 2018; Xia et al., 2018), we conducted a systematic literature review to facilitate the collection of individual studies in a thorough, unbiased manner for summarisation of the gathered information to create new knowledge and identify directions for future research (Denyer and Tranfield, 2009; Kitchenham, 2004).

3.1. Systematic literature review and analysis

Systematic literature reviews follow an explicit method where researchers predetermine their planned search strategy, search terms, search process, and inclusion/exclusion criteria to reduce inherent researcher bias and provide transparency and reproducibility (Ouzzani et al., 2016). Our systematic literature review on the topic of SL was conducted by following the general guidelines outlined by Denyer and Tranfield (2009). Fig. 1 depicts a flowchart of the full process based on the checklist of Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) (Moher et al., 2009). The three major stages of conducting the review and synthesis are outlined in detail in the following sections.

3.1.1. Planning the review and searching the literature

As recommended by Denyer and Tranfield (2009) and Moher et al. (2009), the authors first planned the search strategy by developing a protocol which identified suitable literature databases, predetermined appropriate keyword search terms (outlined in this section) and established a set of predefined inclusion and exclusion criteria (outlined in detail in Section

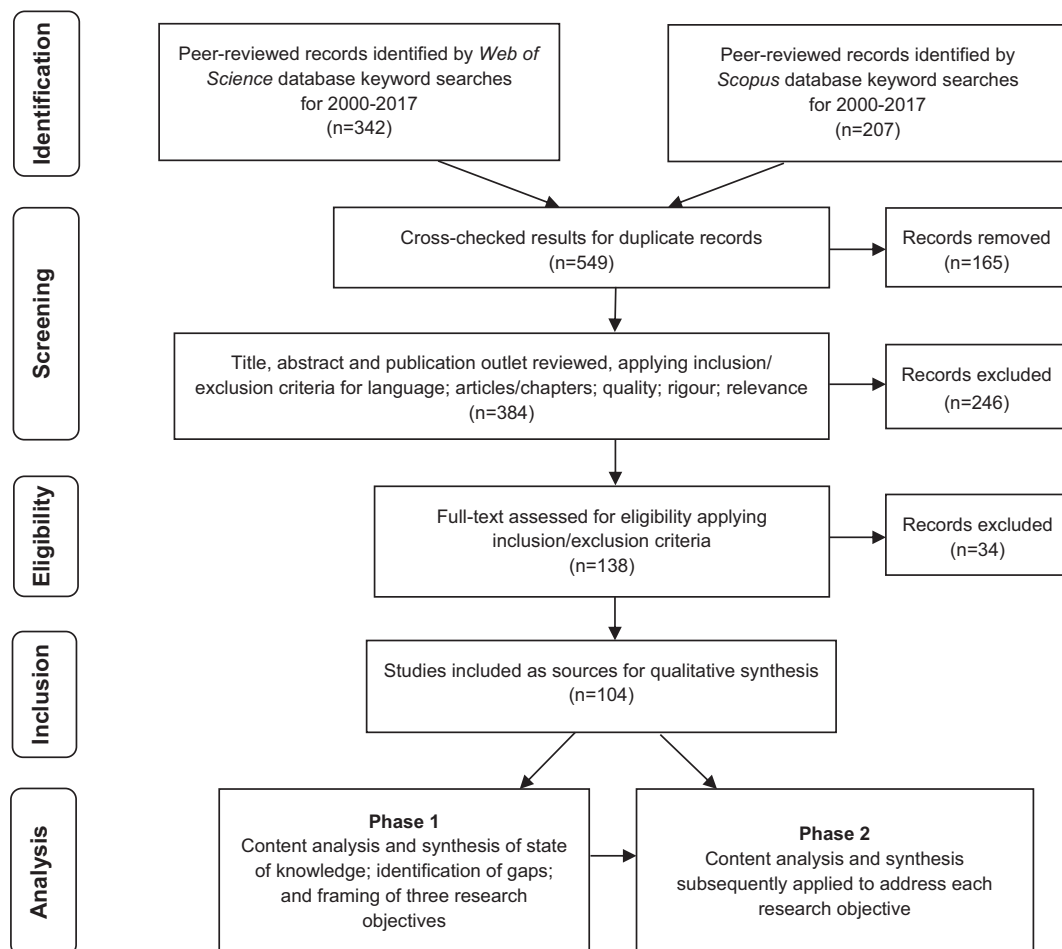


Fig. 1. Flow diagram of systematic literature review and analysis process.

3.1.2). We selected two major online multi-disciplinary databases, *Web of Science* and *Scopus*, since these are generally considered to “best represent the overall structure of world science at a global scale” (Guerrero-Botea and Moya-Anegón, 2012, p. 675). These two databases enabled us to search across multiple disciplines and fields of study in an attempt to capture the fragmented body of SL literature. Two additional databases with less stringent inclusion criteria (*ProQuest* and *Google Scholar*) were also included in the protocol to broaden the reach of the search.

Since the concept of SL was introduced at the turn of the century, our search was planned to span almost 20 years of publications from January 1, 2000 until November 30, 2017 (the day of the search). Two predefined keyword searches were conducted. The term “shared leadership” AND team* yielded 342 peer-reviewed records in *Web of Science*, and 207 records in a title, abstract and keyword search of *Scopus*. The second search using “shared leadership” AND “project team*” identified 15 records in the *Web of Science* and 12 entries in the *Scopus* search results. The additional searches of the *ProQuest* and *Google Scholar* databases yielded 2040 and 20,000 results respectively for “shared leadership” AND team*. A manual review of the results revealed that these two search engines were too coarse and therefore the results were not included.

3.1.2. Screening

The results of the *Web of Science* and *Scopus* database searches were then combined and 165 duplicate results were removed, leaving 384 records. Manual screening of each article's publication source and abstract was then conducted according to the following predefined inclusion criteria: articles must be i. written in English; ii. published in peer-reviewed journals, books or book chapters (not conference papers); and iii. published in high ranking journals (to control for study quality).

To meet the quality criteria of methodological rigour and internal/external validity (Higgins and Green, 2008; Van Klaveren and De Wolf, 2015), it was predetermined that articles must be published in peer-reviewed journals ranked in Quartile 1, the highest indicator of scientific journal prestige (Guerrero-Botea and Moya-Anegón, 2012) in the Scientific Journal Rankings (SJR) online index (SCImago, 2017). This led to the inclusion of articles published in journals such as the *International Journal of Project Management*, *Project Management Journal*, *Academy of Management Journal*, *Journal of Applied Psychology*, *Personnel Psychology*, and the *Leadership Quarterly*. To avoid unnecessarily excluding other relevant and rigorous studies published in lower ranking journals (Kitchenham, 2004; Van Klaveren and De Wolf, 2015), the abstract of each non-Quartile 1 record was reviewed and if deemed likely to meet the required standards, these articles were permitted to pass through to the next stage of full text review. Examples of this include articles by Clarke (2012) and Erkutlu (2012), both published in *Team Performance Management* (Quartile 2). To address possible researcher bias (Kitchenham, 2004) at this stage of the screening, the inclusion/exclusion

process was conducted *independently* by two of the authors, who later reached consensus through discussion of any disparities in applying the predetermined criteria. A similar reliability cross-check was conducted after the full-text screening of the remaining articles.

The abstract review excluded 246 more records, leaving a total dataset of 138 articles and book chapters (126 on general SL and 8 on SL in project teams). The full-text review removed 34 more records due either to their lack of rigour or relevance. The remaining dataset consisted of 104 articles and book chapters (99 on general SL and 5 on SL in project teams) which provided the key source studies for the subsequent literature analysis.

3.1.3. Extraction, analysis, synthesis and documenting the review

The remaining papers were then analysed using content analysis, an inductive technique to facilitate the summarisation and synthesis of information to identify the current state of knowledge (Krippendorff, 2004). The content analysis involved two phases. In the first phase, the analysis of the 104 academic sources formed the basis of the integration of the extant literature presented in the Introduction and Research needs sections of this paper. This initial analysis identified major gaps in current knowledge that guided the formulation of the three research objectives, which framed the second phase of the study. Further content analysis of the 104 sources was then conducted to address the research objectives.

First a summary table (Table 1, Section 4) was developed to present seminal, highly cited and/or recent studies presented in chronological order. To address objective one (develop a new definition of SL within the project team context), we identified, integrated and synthesised existing definitions of SL in Section 4. To address the second research objective (develop an integrated, multi-level conceptual model of SL), following the recommendations of Nicolaides et al. (2014) and Kozlowski et al. (2016), we adapted and expanded Mathieu et al.'s (2008) multi-level I-M-O-I systems model of team functioning. We then conducted a further round of content analysis of the 104 sources to identify specific inputs, moderators and outcomes of SL (reported in Tables 2 and 3) as potential variables for testing in the proposed new model of SL in project teams. Finally, to address research objective three (to develop a future research agenda), in Section 8 we synthesised research issues identified during the literature analysis and also outlined further research opportunities that arise from the new conceptual model.

4. Conceptualisation of shared leadership in the extant literature

As previously noted, SL research in all disciplines is still in its nascent stage (Nicolaides et al., 2014), with existing studies characterised by a multitude of theoretical approaches (Fitzsimons et al., 2011; Kozlowski et al., 2016). In addition, the construct of SL lacks conceptual coherence (Avolio et al., 2009; Kozlowski et al., 2016). Table 1 presents a summary of the many definitions of SL, the sample type, and the techniques

Table 1
Team types, definitions and measures in key shared leadership studies.

Year	Author	Sample	SL Definition	SL Measure
2001	Pearce & Sims	Change management teams	Leadership that emanates from the team members and not simply from the appointed team leader	Aggregation
2002	Sivasubramaniam et al.	Undergraduate teams	Collective influence of members in a team on each other	Aggregation
2002	Erez et al.	Undergraduate teams	Leadership can be shared over time whereby team members share (albeit not at once) in responsibilities involved in the leadership role by clarifying who is to perform specific role behaviours (i.e. leader and member)	Social Network Analysis (SNA) (Centralisation)
2003	Pearce & Conger	Book	A dynamic, interactive influence process among individuals in teams for which the objective is to lead one another to the achievement of team or organisational goals, or both. This influence process often involves lateral influence and at other times involves upwards or downwards hierarchical influence	
2004	Pearce	Knowledge work teams	Occurs when all members of a team are fully engaged in the leadership of the team and are not hesitant to influence and guide their fellow team members in an effort to maximise the potential of the team as a whole	Aggregation
2005	Pearce & Manz	Theory paper	The role of the designated leader is critical to the ongoing success of self- and SL in knowledge work. SL entails a simultaneous, ongoing, mutual influence process within a team that involves the serial emergence of official as well as unofficial leaders	
2006	Ensley et al.	Top management teams	Team process where leadership is carried out by the team as a whole rather than solely by a single designated individual	Aggregation
2006	Mehra et al.	Financial services sales teams	Shared, distributed phenomenon in which there can be several formally appointed and/or emergent leaders	SNA (Centralisation)
2007	Carson et al.	MBA student teams	An emergent team property that results from the distribution of leadership influence across multiple team members	SNA (Density)
2012	Bergman et al.	Undergraduate student teams	The number of members contributing behaviourally to the leadership of the team	SNA (Density)
2012	Erkutlu	Banking teams	An emergent team property that results from the distribution of leadership influence across multiple team members (Carson et al., 2007)	Aggregation
2013	Hoch	New product development teams	A dynamic interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organisational goals or both (Pearce and Conger, 2003)	Team Consensus
2013	Muethel & Hoegl	Self-managed professional teams	Influence exertion by one team member toward a specific fellow team member and the acceptance of that influence attempt by the targeted team member	Theoretical
2014	Hoch & Kozlowski	Globally-dispersed R&D teams	Based on the premise that team leadership should not be the sole responsibility of the hierarchical leader, but should be collectively exercised by empowering and developing individual team members	Aggregation
2014	Liu et al.	Work teams	Involves non-hierarchical relationships and describes a relational phenomenon that is characterised with a dynamic, interactive influence process among individuals in the team	SNA (Density)
2014	Nicolaides et al.	Meta-analysis	A set of interactive influence processes. Team leadership functions are voluntarily shared among internal team members in pursuit of team goals	
2014	Wang et al.	Meta-analysis	An emergent team property of mutual influence and shared responsibility whereby team members lead each other toward goal achievement	SNA (Density)
2015	Lee et al.	Student virtual teams	A voluntarily, informally emergent structure beyond vertical leadership	

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Table 1 (continued)

Year	Author	Sample	SL Definition	SL Measure
2015	Mathieu et al.	Student teams	Horizontal leadership, wherein members exert influence on each other in order to realise team goals	SNA (Density)
2016	D'Innocenzo et al.	Meta-analysis	An emergent and dynamic process whereby multiple individuals can take on leadership roles according to the needs of the group	
2016	Kozlowski et al.	Meta-analysis	Leadership is distributed across team members rather than being concentrated in a single person and role	
2016	Muethel & Hoegl	Theoretical	Dynamic, interactive influence processes among peers to increase team effectiveness (Pearce and Conger, 2003)	SNA (Density, Centralisation, Efficiency)
2016	Wu & Cormican	Engineering design teams	Leadership that emanates from the members of teams and not simply from the appointed team leader (Pearce & Sims, 2001)	SNA (Density, Centralisation)
2017	Lord et al.	Systematic review	Different individuals enact leader and follower roles at different points in time	
2018	Aubé et al.	Student project teams	Each team member engages in leadership functions and accepts their colleagues' leadership. A dynamic and interactive influence phenomenon, through which members mutually encourage each other to contribute to attaining collective objectives (Pearce and Conger, 2003)	
2019	Sweeney et al.	Systematic review	A dynamic interactive influence process among individuals in groups.	

used to measure SL. Studies have researched a range of team types, including; students (e.g., Bergman et al., 2012; Carson et al., 2007), top management (Ensley et al., 2006), financial services (Mehra et al., 2006), banking (Erkutlu, 2012), knowledge workers (Pearce, 2004), research and development (Hoch and Kozlowski, 2014), and engineering design teams (Wu and Cormican, 2016).

From Table 1 it can be seen that studies vary in the way they operationalise and measure SL. Many researchers have adopted an aggregation method by calculating the mean of team members' perceptions of their collective participation in SL (e.g., Erkutlu, 2012; Hoch and Kozlowski, 2014; Pearce and Sims, 2002). Another measurement approach that is growing in popularity involves social network analysis (SNA) of the team interactions. The ties or linkages between team members are measured to produce a density score (e.g., Lee et al., 2015; Mathieu et al., 2015) and/or the degree of distribution of leadership within the team is calculated to produce a measure of centrality (e.g., Erez et al., 2002; Mehra et al., 2006). Recent meta-analytic studies of SL research (D'Innocenzo et al., 2016; Kozlowski et al., 2016) flag that the measurement of SL is an important issue for researchers to consider since measurement type causes differences in results, with social network analysis producing larger effect sizes.

Conceptually, SL is a team-centric phenomenon (Kozlowski et al., 2016) in that it is “something created by a team” (Day et al., 2004, p. 860) and “an outcome of the inter-relationships of team members” (p.859). According to Kozlowski et al. (2016), the most widely used definition is Pearce and Conger's (2003, p. 1), which describes SL as a

“dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organisational goals or both. This influence process often involves peer, or lateral, influence and at other times involves upward or downward hierarchical influence”. SL can exist as a solely horizontal form of leadership, for example, when it occurs in self-managing work teams which have no formally nominated leader (e.g., Muethel and Hoegl, 2013). However, in many other instances, a vertical leader can coexist with SL (Pearce and Manz, 2005), and that leader encourages team members to share leadership between themselves (Hoch and Dulebohn, 2013). In fact, some researchers argue that SL is less likely to emerge without the support of the formal leader (Muethel and Hoegl, 2016). Moreover, Pearce et al. (2007, p. 286) argue that “folding leadership from above into the measurement of shared leadership provides a more parsimonious model... It also reflects the reality of leadership in many workplaces”.

SL is not a static phenomenon (Friedrich et al., 2011); it is conceptualised as a dynamic emergent process that unfolds over time (Kozlowski et al., 2016). Therefore, in projects, the roles and relationships between team members will emerge, co-evolve and change (D'Innocenzo et al., 2016) across the entire life cycle of the project. As such, SL is “a transferable and quite fluid process that not only can be performed by multiple individuals as events unfold, but also can largely reside within the very individuals that are being influenced” (Pearce et al., 2008, p. 132). In SL, the responsibilities for leading portions of the work are distributed among team members according to their expertise and skills, so that the formal team leader is not solely responsible for the leadership

Table 2
Multiple multi-level inputs, mediators and outcomes of shared leadership.

Inputs	Mediators	Outcomes
MACRO-LEVEL		
<u>Organisation</u>		
Organisational design and structure (Yammarino et al., 2012)		<u>Organisation</u>
Culture and values (Yammarino et al., 2012)		Client satisfaction (Carson et al., 2007)
Organisational norms SL (Ulhøi and Müller, 2014)		Business performance (D'Innocenzo et al., 2016)
Top management support (Buchanan et al., 2007)		Business innovation (Hoch, 2013)
		Organisational effectiveness (Pearce and Sims, 2002)
		Firm financial growth (Ensley et al., 2006)
		More innovative culture (Buchanan et al., 2007)
		More participative culture (Buchanan et al., 2007)
		Reinforces SL in organisation (Ulhøi, 2005)
		Organisational learning (Liu et al., 2014)
		Identifies training needs (D'Innocenzo et al., 2016)
MESO-LEVEL		
<u>Formal Project Leader</u>	<u>Emergent Team States</u>	<u>Project</u>
Encourages SL (Hoch and Dulebohn, 2013)	Empowerment (Batistič et al., 2017)	Task performance (Ensley et al., 2006; Carson et al., 2007; Small and Rentsch, 2010; Hoch et al., 2010; D'Innocenzo et al., 2016; Sousa and Dierendonck, 2016; Zhou and Vredenburg, 2017)
Humility (Chiu et al., 2016)	Cohesion (Zaccaro et al., 2001; Mathieu et al., 2015; Batistič et al., 2017)	Innovation (Hoch, 2013)
Empowering (Hoch, 2013; Fausing et al., 2015; Grille et al., 2015)	Trust (Mathieu et al., 2000; Drescher et al., 2014)	
Facilitates expertise sharing (Muethel and Hoegl, 2016)	Confidence (Nicolaidis et al., 2014)	
Fosters collaborative decision making (Muethel and Hoegl, 2016)	Potency (Sivasubramaniam et al., 2002)	
Respects competencies (Muethel and Hoegl, 2016)	Psychological safety (Lee et al., 2018; Liu et al., 2014)	
Provides coaching support (Carson et al., 2007)	Motivation (Brock and Kim, 2002)	
Rewards SL (Grille et al., 2015)	Flow (Aubé et al., 2018)	
<u>Team</u>	<u>Emergent Team Processes</u>	<u>Team</u>
Shared purpose (Carson et al., 2007)	Knowledge sharing/processing (Fausing et al., 2015; Muethel and Hoegl, 2016; Lee et al., 2015)	Team effectiveness (Pearce and Sims, 2002)
Task/goal interdependence (Fausing et al., 2015)	Planning, decision-making, expertise coordination (Brock and Kim, 2002)	Creativity (D'Innocenzo et al., 2016)
Team norms align with SL (Grille et al., 2015)	Learning (Wister et al., 2014; Wang et al., 2017)	Learning (Liu et al., 2014)
Internal team environment (Carson et al., 2007; Daspit et al., 2013)	Innovation (Wu and Cormican, 2016)	Sense of belonging (Barrick et al., 2007)
Collectivism (Small and Rentsch, 2010)	Creativity (Brock and Kim, 2002; Lee et al., 2015)	Satisfaction (D'Innocenzo et al., 2016)
Social support (Carson et al., 2007)	Cooperation (Mathieu et al., 2000)	Viability of team for future projects (D'Innocenzo et al., 2016)
Intra-team trust (Small and Rentsch, 2010)	Shared mental models (Zaccaro et al., 2001)	
Encourage member autonomy (Buchanan et al., 2007)	Risk taking (Lee et al., 2015; Liu et al., 2014)	
Openness to experience (Zhou and Vredenburg, 2017)		
Conscientiousness (Zhou and Vredenburg, 2017)		
MICRO-LEVEL		
<u>Individual Team Member</u>		<u>Individual</u>
Integrity (Daspit et al., 2013)		Performance (Liu et al., 2014)
Knowledge, expertise and competence (Mathieu et al., 2008)		Skills development (Liu et al., 2014)
Willingness to taking on responsibility (Carson et al., 2007)		Learning (Liu et al., 2014)
		Creativity (Lee et al., 2015)
		Satisfaction with team (Roberts and You, 2018; Kozlowski et al., 2016)
		Trust in team members (Roberts and You, 2018)
		Confidence (Kozlowski et al., 2016)

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Table 3
Moderators of shared leadership development and outcomes.

Input-SL relationship	SL-Outcome relationship
Task complexity (Wang et al., 2014; Nicolaidis et al., 2014)	Task complexity (Clarke, 2012; Wang et al., 2014)
Team size (Nicolaidis et al., 2014)	Team knowledge, expertise, competence (Mathieu et al., 2008)
Team diversity and age (Hoch et al., 2010)	Team tenure (Nicolaidis et al., 2014)
National culture (Antonakis et al., 2012)	Team demographic diversity (Hoch, 2013)
Team shared purpose (Carson et al., 2007)	Team autonomy (Fausing et al., 2013)
Team tenure (Wang et al., 2014)	Geographic dispersion (Hoch and Kozlowski, 2014)
Team knowledge diversity (Hoch and Kozlowski, 2014)	Match between organisational capabilities and project requirements (Bond-Barnard et al., 2018)
Team dispersion and virtuality (Hoch and Kozlowski, 2014)	Level of risk accepted (Bond-Barnard et al., 2018)
Organisational structure (Mihalache et al., 2014)	Organisation culture (Sarker et al., 2009; Erkutlu, 2012)
Organisation culture (Sarker et al., 2009; Erkutlu, 2012)	

function (Morgeson et al., 2010). Essentially then, SL is a team process which emerges as the consequence of a highly interactive dialogue (Rawlings et al., 2000) and regular interpersonal interactions between team members who rely on each other and exert mutual influence on one another (DeRue, 2011).

5. Development of an integrative definition of shared leadership in project teams

To address the identified lack of conceptual clarity (Kozlowski et al., 2016), we now develop a definition of SL in the project team context. Through integrating the literature, capturing the basic elements of SL and situating them in projects, the following definition of SL in project teams is articulated. Enabled by a supportive vertical project manager (Pearce and Sims, 2002) who encourages the emergence of horizontal, team-centric leadership (Kozlowski et al., 2016), SL in projects emerges as a dynamic, iterative, fluid and cyclic process (D’Innocenzo et al., 2016) that distributes influence across multiple

project team members (Pearce and Conger, 2003) at different times (Kozlowski et al., 2016) and at different phases in the team and project life cycle (Wu and Cormican, 2016).

Leadership in project teams is shared on the basis of required knowledge, task expertise and competence in order to foster effective project team functioning (Bergman et al., 2012), to enhance technical processes to produce greater project team efficiency to achieve team goals (Nicolaidis et al., 2014; Pearce and Conger, 2003), and to improve project task outputs while fostering positive individual member and organisational outcomes (D’Innocenzo et al., 2016). SL in the project management context is a complex, multi-level, multivariate phenomenon that emerges and reconfigures both in an ongoing and a cyclic manner. The very complex and fluid nature of SL, its potential benefits, and its novelty in project management research provides fertile ground for future studies that are multi-dimensional in nature.

6. Development of a multi-level conceptual model of shared leadership in project teams

Our proposed new conceptual model of SL in the project team context is presented in Fig. 2. As recommended by D’Innocenzo et al. (2016) and Batistič et al. (2017), our model adopts a multi-level lens that simultaneously considers all three nested levels of functioning; micro (individual), meso (team and project), and macro (organisation). In the model, in line with Yammarino et al. (2005), individual project team members are embedded in networks of interaction between each other, and the project team itself is further embedded within a wider network of interactions with other teams, business units and leaders from the wider organisation.

Our initial review of the extant literature identified a recent call for further theoretical development of SL leadership theory (Kozlowski et al., 2016; Nicolaidis et al., 2014) through the adoption of a process-based model of SL, situating SL as a mediator between inputs and outcomes (Antonakis et al., 2012; Carson et al., 2007; Hoch, 2013). Following the advice of eminent SL researchers (Kozlowski et al., 2016; Nicolaidis et al., 2014), we have adopted an I-M-O-I model as a base for modification and

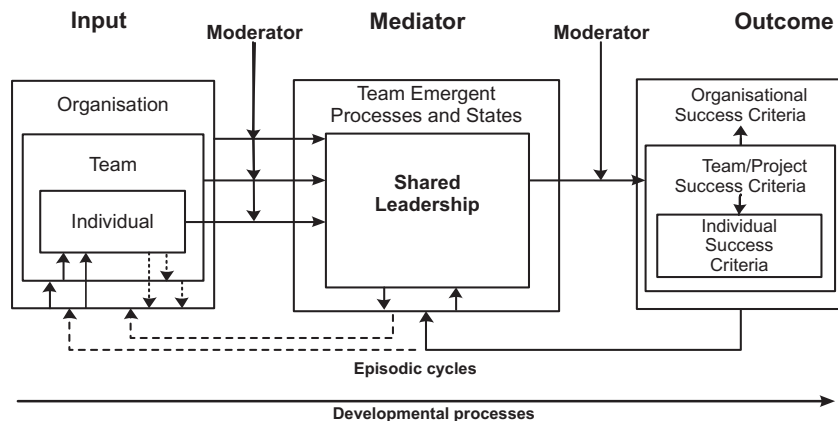


Fig. 2. Proposed multi-level systems model of shared leadership in project teams.

adaptation in the project team context. Our new model draws upon and adapts Mathieu et al.'s (2008) conceptualisation of team functioning that provides a holistic, multi-level, moderated systems perspective in which inputs influence more distal team outputs and outcomes through more proximal mediating emergent states and team processes. Mathieu et al.'s (2008) systems framework has been recommended as a promising theoretical model for exploring the multi-level dimensions of SL (Kozlowski et al., 2016; Lord et al., 2017). It is also one of the most highly regarded functional models in the team literature, cited 708 times in 2018 in the *Web of Science* online database. Their framework also captures the essence of SL as an emergent “team process” (Antonakis et al., 2012; Carson et al., 2007; Hoch, 2013) and as a “team-centric” phenomenon (Kozlowski et al., 2016). Additionally, Mathieu et al.'s (2008) time-sensitive model of episodic cycles and reflexive feedback loops is well suited to our definition of SL in project teams as a fluid and dynamic process.

We now turn to further content analysis of the identified SL literature sources to specify elements of the proposed new conceptual model of SL in project teams. In the following sections, potential variables and their relationships are identified from other fields of research to populate the proposed model to enable its future testing and validation within the domain of project management.

6.1. Multi-level inputs to shared leadership

Inputs are the antecedent factors that enable the development of SL. These antecedents are the most distal inputs to the model (Antonakis et al., 2012). Hoch and Dulebohn (2013) identify four main types of antecedents for SL in teams: (1) intrinsic team member characteristics; (2) vertical leadership behaviour; (3) supporting factors from within the team; and (4) external factors within the wider organisation. These four types of antecedents occur at the individual, team, and organisational levels. The multi-level antecedents of SL are reported in the inputs column of Table 2 and are outlined in more detail below.

6.1.1. Micro-level attributes and behaviours of individual team members

In order for SL to occur, individual team members must be willing to take on the leadership role, to exercise their voice (Carson et al., 2007), and to seek to influence the direction, motivation, and support of the group (DeRue, 2011; Hoch and Dulebohn, 2013). Research has found that other individual level characteristics like individual member integrity (Daspit et al., 2013), personality, knowledge, expertise and competence (Mathieu et al., 2008) are also likely to affect whether and how SL emerges at the team level.

6.1.2. Meso-level attributes and behaviours of the formal project manager

In project teams, where there is usually a formally designated leader with authority over the team, i.e. the project manager, that leader needs to be humble (Chiu et al., 2016) and must be willing to allow and encourage other team members to take on leadership roles (Hoch and Dulebohn, 2013). Vertical leaders who are able to

share their leadership with other team members respect and recognise other members' competencies and specialist expertise (Chiu et al., 2016). The vertical leader identifies and selects competent potential leaders and empowers them to lead (Hoch and Dulebohn, 2013; Fausing et al., 2015; Grille et al., 2015), coordinating their expertise-sharing and encouraging collaborative decision making (Muethel and Hoegl, 2016). In addition, by rewarding SL behaviours (Grille et al., 2015) and providing coaching support (Carson et al., 2007), vertical leaders can effectively foster the emergence of SL.

6.1.3. Meso-level attributes and behaviours of the team

SL is also facilitated by the internal team environment (Daspit et al., 2013; Hoch and Dulebohn, 2013). This occurs through shared purpose; social support; and empowered voice (Carson et al., 2007), all of which foster coordination, planning, decision making and knowledge sharing. SL is more likely to occur where there is task interdependence (Fausing et al., 2015). A strong internal team environment supports the development of leadership networks characterised by high levels of mutual influence and distributed leadership responsibilities (Carson et al., 2007). Trust and collectivism (Small and Rentsch, 2010) also provide a safe environment for team members to exercise autonomy (Buchanan et al., 2007). A team's openness to new experiences and degree of conscientiousness is also known to foster the emergence of SL (Zhou and Vredenburg, 2017). A sense of team psychological empowerment also operates as an intrinsic motivating factor of SL (Grille et al., 2015). Another factor is the degree to which SL aligns with the existing norms of the team (Grille et al., 2015).

6.1.4. Macro-level organisational inputs

At the organisational level, multiple factors can impact the development of SL, such as top management's support of leadership role sharing (Buchanan et al., 2007). Also, the development of SL is likely to occur when the organisational design, structure, culture, values (Yammarino et al., 2005) and norms (Ulhøi and Müller, 2014) encourage both the formal vertical project manager and team members to engage in collaborative leadership practices.

6.1.5. Inter-relationships between inputs at different levels

In the proposed new model, following the example of Mathieu et al. (2008), the higher level input factors (the outer rectangles) exert downward influence (depicted by solid lines) on the lower levels of the nested inputs (the inner rectangles). For example, top-down management support (Buchanan et al., 2007), organisational norms, training and coaching (Ulhøi and Müller, 2014) are helpful in encouraging the formal project manager and team members to share leadership roles. Upward influence can also occur, but is likely to be lesser than the downward influence, and hence it is depicted by broken lines.

6.2. Mediators

Past research has tended to focus more on the inputs and outcomes of SL (Wang et al., 2014). Therefore, the

incorporation of emergent team processes and states as mediating variables (Serban and Roberts, 2016) is an important addition to the new conceptual model of SL in projects. Mediators explain the mechanism through which an input in the model affects the outcomes (Mathieu et al., 2008). For example, the impact of the input of empowering leadership on task outcomes is transferred via the mediation of emergent states such as team potency (Scott-Young and Samson, 2009). Mediators are more proximal outputs of SL, which then impact more distal outcomes like team performance (Antonakis et al., 2012; Nicolaides et al., 2014). As such, these mediators occur at the team level of analysis. As recommended by Kozlowski et al. (2016), the mediator section of the proposed conceptual model represents SL (a team process itself) as embedded in the proximate team environment in which it operates.

6.2.1. Shared leadership as an emergent team process

SL “can be viewed as an emergent state (individual- to team-level convergence) that then shapes team processes and outcomes” (Kozlowski et al., 2016, p. 21). SL emerges from the enabling multi-level inputs on the left hand side of the model and involves the team members assuming multiple functions and responsibilities of leadership to facilitate project completion and the multi-level outcomes on the right hand side of the model (Contractor et al., 2012; Hoch, 2013; Morgeson et al., 2010). The feedback arrows linking SL to the other mediating variables in the centre of the model depict how SL impacts and is impacted dynamically by other team emergent processes and states, which are described in the next sections.

6.2.2. Other emergent team processes

Potential mediating variables drawn from the SL literature (see the centre column of Table 2) are now outlined. SL impacts the emergence and performance of other team processes, i.e., the interactions and actions taken to accomplish the team's tasks (Rousseau et al., 2006). Studies have found that SL positively influences team planning, decision-making, expertise coordination, knowledge-sharing/processing (Bock and Kim, 2002; Muethel and Hoegl, 2016), team learning (Wang et al., 2014; Wister et al., 2014) and team innovation (Wu and Cormican, 2016). SL facilitates shared learning patterns by promoting increased team member interaction, information flow and knowledge exchange (Wister et al., 2014). SL also facilitates other beneficial team processes like mentoring and coaching behaviours (Wister et al., 2014).

6.2.3. Emergent team states

SL also impacts emergent team states, which are defined as “cognitive, motivational, and affective states of teams [that are]... dynamic in nature” (Marks et al., 2001, p. 357). SL creates a strong sense of team empowerment, team identification and team satisfaction (Wang et al., 2014). SL is also instrumental in developing shared team mental models, team cohesion and metacognition (Ulhøi and Müller, 2014; Zaccaro et al., 2001). SL facilitates the formation of team psychological safety, a shared belief among individual members within a team whether they feel safe taking risks (Lee et al., 2015; Liu et al.,

2014). SL also facilitates positive team states such as flow (Aubé et al., 2018), which stimulates team motivation and creativity (Bock and Kim, 2002; Lee et al., 2015). SL can also give rise to positive emergent states such as team cohesion (Batistič et al., 2017), trust (Drescher et al., 2014), confidence (Nicolaides et al., 2014), potency (Sivasubramaniam et al., 2002), and motivation (Bock and Kim, 2002), thereby building the team's social capital (Day et al., 2004).

6.3. Feedback loops

It is important to note that some team processes and/or affective states (e.g., trust), can act as inputs of emergent SL (Small and Rentsch, 2010) and can also emerge as proximal team outcomes (mediators) as a result of the process of SL (Drescher et al., 2014), and can become an even more distal outcome even after the project has been completed (Roberts and You, 2016) (as depicted in Table 2). This is because as previously identified, team functioning is not linear, but is complex, dynamic, fluid, and occurs in cyclic feedback loops (Mathieu et al., 2008). Adding to the dynamic emergent process of SL (Carson et al., 2007), the members who share leadership can change over time due to the changing nature of the required task, needed expertise, or according to the requirements of the particular project phase (Klein et al., 2006). These changes then set up new patterns of SL, which in turn initiates a new cycle of team tasks, states and processes (Kozlowski et al., 2016), which may generate further trust, enhancing great collaboration and building cohesion (Mathieu et al., 2000), which, in turn results in positive team performance (Wang et al., 2014). The cyclic, reciprocal relationship between the unfolding and changing nature of SL and its interaction with other mediating team states and processes is indicated by solid arrows in the nested mediator section of the proposed model and also in the feedback loops to the inputs.

6.4. Multi-level outcomes of shared leadership

This section explores the outputs of SL in the proposed new conceptual model. Although SL is conceptualised as a team-level construct (Kozlowski et al., 2016) that plays out at the project level, SL can produce cross-level effects at the individual and organisational levels as well. In the general SL literature, success is related to how the “outcomes of leadership processes... typically impact the people involved (e.g. individual commitment), the proximate environment they operate in (e.g., team cohesion) and over time, [and] in the case of senior/higher-up leadership relations, the norms, implicit rules or performance of an organisation or division” (Batistič et al., 2017, p. 100). Just as we have argued that the inputs to SL can occur at multiple levels, so too can the outcomes. The possible outcomes of SL in project teams are summarised in the right-hand column of Table 2. They will be discussed at the key impact levels of: i. micro-level individual attitudinal, behavioural and performance outcomes; ii. meso-level team functioning, team performance and project outcomes; and iii. Macro-level organisational performance outcomes.

6.4.1. Micro-level individual outcomes

Although most studies have examined SL outcomes at the team level only (D'Innocenzo et al., 2016), a few have focussed on individual-level outcomes, primarily in three domains: attitudes; performance; and skills development (D'Innocenzo et al., 2016). With respect to attitudes, Roberts and You (2018) found that SL is positively related to individual team member satisfaction and trust. SL increases individual members' confidence and satisfaction with working in the team because members who shared leadership can actively contribute both to the team processes and to achieving the team's shared goals (Kozlowski et al., 2016). SL can also impact the outcomes for individual team members in terms of their beliefs about SL, their overall job satisfaction (Wood and Fields, 2007), individual commitment (Batistič et al., 2017; D'Innocenzo et al., 2016), and desire to participate in SL again. SL also positively impacts individual's intentions to remain within the company and desire to work with the same team members again (D'Innocenzo et al., 2016), which are both important for building capacity within the organisation. SL also contributes toward enhancing individual performance, fostering individual creativity (Lee et al., 2015), skills development, and learning through providing greater opportunities for mentoring and coaching (Liu et al., 2014).

6.4.2. Meso-level team outcomes

The majority of SL studies have focussed on outcomes that occur at the team level of analysis (Kozlowski et al., 2016). Similar to the individual level, the outcomes that are likely to result from SL are also multi-dimensional in nature. They include team effectiveness (Pearce and Sims, 2002), the team's collective feelings and attitudes, such as general team satisfaction (D'Innocenzo et al., 2016; Serban and Roberts, 2016) and team task satisfaction (Serban and Roberts, 2016). SL also increases team viability (D'Innocenzo et al., 2016), a team-level outcome that occurs when the team collectively experiences a sense of belonging (Barrick et al., 2007) and a desire to work together on further projects. It is therefore argued that SL enhances team effectiveness by increasing the ongoing social capital of the team (Day et al., 2004). SL also enhances team functioning (attitudes and behaviours), which in turn achieves better task performance (Carson et al., 2007; D'Innocenzo et al., 2016). As well as impacting more distal outcomes like project performance, SL exerts an intermediary impact on more proximal outcomes such as team functioning (Wang et al., 2014) through impacting upon mediating team emergent states and emergent processes (Yammarino et al., 2012). Our model classifies the unique processes and emergent states that characterise team functioning as proximal outcomes that occur throughout the entire duration of the project, for example innovation (Hoch, 2013) and team learning (Liu et al., 2014).

6.4.3. Meso-level project outcomes

Studies of other types of leadership in the project management literature (e.g. Anantatmula, 2010) have found that leadership is linked to project success or failure. For instance,

Geoghegan and Dulewicz (2008) compared specific leadership attributes to various measures of project success, finding that success in project problem solving was significantly correlated to leadership attributes such as empowerment, motivating others, managing resources and developing people. The few extant studies of SL in project teams have demonstrated that SL is related to superior task outcomes in terms of quality, quantity and innovation (e.g., Carson et al., 2007; Hoch et al., 2010; Small and Rentsch, 2010).

Project researchers and practitioners are aware that there are many facets to project success (Jugdev and Müller, 2005), but these are not yet addressed in the extant research, largely because there are few studies of workplace project teams. The success of a project team's task outputs can be measured from two perspectives; project management internal efficiency (project performance on cost, time and quality), and project effectiveness in terms of the project's delivery to scope and the value that it delivers to its stakeholders (Cooke-Davies, 2002; Jugdev and Müller, 2005). To the best of our knowledge, no known study of SL has explored these criteria of project success.

With regard to evaluating project success, it should be noted that one critical limitation of inferring SL success from project success is that there could be many other factors apart from SL that can impact project success. Factors contributing to a hypothetically failed project may include environmental, legal, political or social setbacks, which are examples of external pressures (Nixon et al., 2012). A similar caution can be applied to the next outcome category (the organisational level), which is even more distal from the process of SL, and is open to many confounding influences.

6.4.4. Macro-level organisational outcomes

SL is positively related to organisational performance measures such as ongoing client satisfaction for repeat business (Carson et al., 2007), firm financial growth (Ensley et al., 2006), business innovation (Hoch, 2013), organisational learning (Liu et al., 2014), as well as overall organisational effectiveness (Pearce and Sims, 2002). SL also impacts more distal outcomes at the organisational level such as business performance and training needs (D'Innocenzo et al., 2016). If perceived as successful for achieving outcomes, SL practices can become reinforced or institutionalised in the organisational culture (Ulhøi and Müller, 2014). Furthermore, through its participative nature, SL may make an organisation more innovative and nimble (Buchanan et al., 2007) and therefore more adaptive in the face of change. Accordingly, given its potential for bolstering organisational performance, SL may yield distinct benefits if incorporated into and linked to an organisation's businesses objectives, strategy, and key performance indicators.

7. Boundary conditions of the new model

Current leadership research is taking a renewed interest in contextual situations that foster or impede leadership practices (Oc, 2018). Based on the recommendations of Gemünden et al. (2018) in the project management literature, and by researchers in the SL literature (e.g., Antonakis et al., 2012; Nicolaidis et al.,

2014), the proposed new model adopts a contingency view to the emergence and outputs of SL by including moderators. Moderators are contextual variables that specify the boundary conditions for the relationship between two variables (Chiu et al., 2016). The impact of moderators either strengthens or weakens the relationship. In our model, there are two possible points for moderation to occur, the first affecting the emergence/development of SL (Inputs – SL relationship) and the second affecting the impact of SL on outcome variables (SL – Outcome relationship). Examples of moderators drawn from the extant SL literature are identified in the following section and are presented in Table 3.

7.1. Multi-level moderators of the emergence of shared leadership

Like the other variables in the model, there can be multiple moderators that exist on multiple levels. One of the most studied moderators is task complexity which increases the likelihood of the emergence of SL (Nicolaidis et al., 2014; Wang et al., 2014). Task time demands (Nicolaidis et al., 2014), team autonomy (Fausing et al., 2013) and shared purpose (Carson et al., 2007) are other task-related moderators of SL emergence. Characteristics of the team that act as moderators of the emergence of SL are size (Nicolaidis et al., 2014), national culture (Antonakis et al., 2012), diversity and age (Hoch et al., 2010), team tenure (Wang et al., 2014), shared propose (Carson et al., 2007), and team knowledge diversity (Hoch and Kozlowski, 2014). Team location factors such as dispersion and virtuality (Hoch and Kozlowski, 2014) also impact the emergence of SL. Two important organisational moderators that influence the emergence of SL are organisational structure (Mihalache et al., 2014) and organisational culture (Erkutlu, 2012; Sarker et al., 2009).

7.2. Multi-level moderators of the effectiveness of shared leadership

Identified moderators that impact the effect of SL on outcomes occur mainly at the project, team and organisational levels. Project complexity is linked to over-runs in project time and costs (Bjorvatn and Wald, 2018), however complex task completion is more likely to be successful if SL is adopted (Clarke, 2012; Wang et al., 2014), possibly through increasing team absorptive capacity (Bjorvatn and Wald, 2018). Team knowledge, expertise and competence (Mathieu et al., 2008), autonomy (Fausing et al., 2013), demographic diversity (Hoch, 2013), tenure (Nicolaidis et al., 2014) and team dispersion and virtuality (Hoch and Kozlowski, 2014; Muethel and Hoegl, 2016) also exert an influence on the relationship between SL and multi-level outcomes. Organisational level moderators are the match between organisational capabilities and project requirements; and the level of risk accepted (Bond-Barnard et al., 2018).

7.3. Time

Temporal elements have often been under-developed in the leadership literature (Castillo and Trinh, 2018). For this reason,

the role of time has been incorporated into the current conceptual model of SL in project teams. Time (e.g. team tenure) can be a moderator of relationships between variables within the model (Wang et al., 2014), but the concept of time takes on a greater meaning in the context of the unfolding process of SL within the project lifecycle. SL emerges and changes over time (Day et al., 2004). Moreover, as situated in a complex interactive system, both SL (Day et al., 2004) and teamwork (Mathieu et al., 2008) develop as team members relate with one another over time.

Time in teams can be conceptualised in two ways (Mathieu et al., 2008): firstly, as a linear, uni-directional development as the team task progresses and teamwork matures over the life of the project in chronological time (Shipp and Fried, 2014); and secondly as punctuated, episodic feedback loops that occur at various points across the team and project life cycle (Ilgen et al., 2005). In the proposed model (Fig. 2), the first aspect of continuous team development and change that unfolds over chronological time across the entire project team life cycle is depicted by a solid uni-directional arrow undergirding the entire I-M-O-I model.

The second punctuated nature of team activities which occur as a team transitions from one episodic activity to another is depicted following the practice of Mathieu et al. (2008). As teamwork is dynamic in nature, there exists a large degree of circularity between the input (I) and mediator (M) conditions (Kozlowski et al., 2016; Mathieu et al., 2008). As the project progresses through different phases of the project life cycle and the team tasks for that phase are successfully completed, or if team membership changes (D'Innocenzo et al., 2016), SL roles may be taken up by a different configuration of team members at these points (Contractor et al., 2012). The feedback loops between M-I are depicted in the model by broken lines.

8. Recommendations for a future research agenda

As SL has received only scant attention in the project management context, this promising construct warrants further investigation. This study has responded to calls for more context-specific SL research (Rashman et al., 2009) by developing a conceptual model of SL for empirical testing and validation within the context of project teams. The proposed new model is evidence-based with likely variables and relationships drawn from extant empirical research mainly conducted on other team types in other domains. As organisational context is known to impact the functioning of management practices (Locke, 2003), it is important that the proposed new model be empirically tested and validated within the project management context. Moreover, due to the high levels of project heterogeneity and changing project contexts (Gemünden et al., 2018), project size, and complexity (Bjorvatn and Wald, 2018), research on SL should be conducted in a variety of project contexts to demonstrate to project practitioners and their organisations when and how SL can impact individual outcomes, team functioning, project and broader organisational outcomes.

Our newly developed model serves as the organising framework for a future research agenda and is supplemented by recommendations identified in our SL literature review to help develop the model further. To stimulate further study of SL in project teams, we propose the following research agenda:

1. Test the full range of the proposed new multi-level moderated I-M-O-I model (Fig. 2.) in different project types using established and proven scales drawn from the extant literature to measure the potential variables identified in Tables 2 and 3. Examples of such scales can be found in the reviewed studies.
2. Investigate newer and more innovative measures of SL as suggested by Kozlowski et al. (2016) and D'Innocenzo et al. (2016). Typically, researchers have aggregated individual team members' perceptual ratings of their team and have then calculated a collective team average, representing the overall amount of SL behaviour (see Hoch and Kozlowski, 2014; Grille and Kauffeld, 2015; Pearce and Sims, 2002). A newer more effective method which is growing in popularity and produces larger effect sizes (D'Innocenzo et al., 2016; Kozlowski et al., 2016) involves social network analysis (SNA) of the team members' interactions to measure leadership density (e.g., Lee et al., 2015; Mathieu et al., 2015) and the degree of leadership centrality (e.g., Carter et al., 2015; Kalish, 2013; Kozlowski et al., 2016). SNA will enable project researchers to better understand the patterns of social interactions and influence that occur between shared leaders and their followers (DeRue, 2011).
3. As advocated by DeRue (2011) and Nicolaidis et al. (2014) in the general SL leadership literature, researchers can advance knowledge by studying both the proximal and distal outcomes of SL. For the project management context, researchers can focus on outcomes that have specific relevance to projects, for example, the efficiency of the project management process (project cost, time and quality) and project effectiveness (in terms of delivery to scope, provision of stakeholder value, and benefits to the business) (see Cooke-Davies, 2002; Müller and Turner, 2007 for suggestions).
4. Study the outcomes of SL for those who take on this behaviour. In our review of the literature we found very little research into the impacts of SL on the designated project manager or on team members who adopt a SL role. This area could be usefully researched to convince project practitioners and their managers of SL's potential for ongoing career development. It is likely that more junior members of project teams can gain valuable experience and feel increased motivation and engagement through participating in leadership sharing (see Wood and Fields, 2007). The impact of taking on a SL role upon leader and team member retention (e.g., D'Innocenzo et al., 2016; Ekrot et al., 2016) could also be more fully explored, especially given the global shortage of project practitioners that organisations will face in the coming decade (Project Management Institute, 2017).
5. As recommended by SL researchers in other fields (e.g., Batistič et al., 2017; DeRue, 2011), studies can begin investigating how SL in project teams occurs in multi-level and cross-level contexts. Special care needs to be taken when specifying appropriate levels of measurement and analysis (D'Innocenzo et al., 2016), making sure that theory is aligned with data (Dionne et al., 2014). Chen et al. (2004), Gockel et al. (2010), and Yammarino et al. (2005) provide useful guidance on these important alignment issues. New multi-level statistical techniques such as hierarchical linear modelling (HLM) and multi-level structural equation modelling techniques can be utilised for analysis (Tuncdogan et al., 2017). Preacher et al. (2010) and Yammarino et al. (2012) provide comprehensive coverage of these multi-level techniques.
6. Test and identify project-related boundary conditions in the new model, as proposed for other types of leadership research (Oc, 2018), to determine when SL is adopted, when it is effective, and when it is not. This suggestion is in accord with Gemünden et al.'s (2018) advice that project management researchers should consider contextual moderators. In addition to complexity (Clarke, 2012; Nicolaidis et al., 2014; Wang et al., 2014) and team geographic and knowledge dispersion (Hoch and Kozlowski, 2014; Muethel and Hoegl, 2016) which are already specified in the new model, other potential moderators relevant to project management are project size (Bjorvatn and Wald, 2018), uncertainty, technology, novelty and pace (Shenhar and Dvir, 2007).
7. Use a longitudinal design (as suggested by DeRue, 2011; D'Innocenzo et al., 2016; Ulhøi and Müller, 2014) via collecting data at several different points in time (e.g., Gupta et al., 2010; Miscenko et al., 2017). This will enable the study of the temporal aspect of SL in greater depth (Castillo and Trinh, 2018; Clarke, 2012) through capturing the multiple iterations and cyclic feedback loops of SL and team functioning across the entire project life cycle.

To advance future research on SL in project teams, including the above recommendations, we encourage researchers to consider, compare and select from a variety of research alternatives, such as qualitative inductive approaches like ethnography, interviews, case studies, or deductive approaches involving quantitative measurement scales and multi-level modelling. Researchers could also consider adopting a mixed-methods design that incorporates both qualitative and quantitative approaches (e.g., Serban and Roberts, 2016). The complex nature of SL in project teams makes its study ripe for the use of many different research approaches to build greater breadth and depth of new knowledge.

9. Study limitations and conclusions

Like any research method, systematic literature reviews are prone to certain limitations (Denyer and Tranfield, 2009). Peer-reviewed studies recorded in online databases display a systematic publication bias since authors (and journals) tend to publish significant, positive results only (Borges de Almeida

and Garcia de Goulart, 2017). We did not adopt suggested countering practices of searching non-peer reviewed grey literature or seeking out unpublished studies (Kitchenham, 2004). Since this study's aim was to summarise existing knowledge and introduce SL into the project management domain through developing a new conceptual model, we chose to focus on high quality research as recommended by Van Klaveren and De Wolf (2015). For this reason, we decided to include only rigorous studies primarily published in Quartile 1 journals (SCImago, 2017). Although we also read the abstracts of non-Quartile 1 publications to include those considered to be rigorous, we note that other worthy studies may have been excluded by our pre-determined process.

Notwithstanding these limitations, this review aims to advance project management research by deepening our understanding of SL which encourages employee participation, a relatively new leadership practice that has so far received scant attention in the project management literature. The paper outlines the development of a new multi-level conceptual model aimed at advancing a holistic understanding of how SL develops in project teams and how it impacts individuals, teams, project management and wider organisational performance. In doing so, this paper responds to two recent project management research calls to study i. different forms of project leadership (Müller et al., 2017, 2018a,b) as well as ii. employee empowerment in projects and its impacts on multi-level organisational outcomes (Keegan et al., 2018).

Through extending the application of SL to the relatively unexplored context of project management, this study makes five conceptual contributions. First, our systematic review and synthesis of extant evidence from other disciplines suggests that SL is a construct that may add value to project management practice. SL has the potential to enhance both project team functioning and project performance, as well as to contribute positively to both individual and wider organisational outcomes. Second, this study contributes to project management scholarship by developing a comprehensive definition of SL in project teams. Third, the paper answers SL researchers' calls for the development of a more integrative, theoretically-based model of SL. The proposed new evidence-based conceptualisation of SL in projects has been developed as a multi-level, moderated I-M-O-I model based on systems theory. We argue that the concept of SL in project teams involves the horizontal sharing of influence and responsibility between multiple team members while being encouraged and supported by the actions of the vertical project manager. Hence, the practice of SL broadens the options for leading project teams, especially in complex, innovative, or knowledge-intensive projects, beyond the traditional practice of a single project manager exercising formal vertical power over team followers. Fourth, the proposed new conceptual model extends the SL literature in a number of new ways by:

- providing a holistic, integrated systems perspective of SL;
- specifying nested relationships between three levels of analysis: individual, project team, and the organisation within which the project team operates;

- including emergent team processes and states as mediators of relationships;
- identifying contextual factors that moderate SL relationships;
- including feedback loops to capture dynamic and cyclic interactions; and.
- adding time, both chronological and episodic, as critical dimensions.

Fifth and finally, drawing on previous research, and building on our newly developed conceptual model, this paper proposes a future research agenda for testing the application of the new SL model in a diverse range of project types and contexts. Potential variables and their relationships have been identified at different levels in the model for further exploration, and a range of possible task and context-related moderating variables have been suggested to establish the model's boundary conditions. Innovative methods for measuring SL and analysing the data are also recommended. It is hoped that this new holistic multi-level, multi-variate systems model of SL will both stimulate research to extend the project management literature in this promising new area of leadership study, and also expand the practical application of SL in project teams through highlighting its wide range of potential benefits.

Conflict of interest

There is no conflict of interest with regards to this article.

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