



Review

Leadership of socio-political vanguards: A review and future directions

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ABSTRACT

With the influential rise of the Alt-Right throughout the West in recent years, there has been a renewed interest in the leadership of these forms of fringe political groups. While some work on the leadership of these types of groups was done in the 1960s, 70s, and 80s, less work has been done since then. Given the important role of these groups in today's political environment, a review and theoretical integration of this past leadership work, along with suggestions for future research directions, is overdue.

This paper begins by reviewing what literature exists regarding the leadership of socio-political vanguards, as well as what additional literature exists that may also be relevant to better understanding the phenomenon of vanguard leadership. Vanguard leadership is then placed within the historical context and goals of past vanguard groups. This analysis then leads to further defining some of the components of vanguard leadership along with a review of typically associated leadership traits, skills and behaviours.

While few theories directly address the way in which vanguard leadership operates, this paper reviews related leadership theories that might offer meaningful contributions to our understanding of socio-political vanguard leadership. Some theories, such as those related to social movements (particularly burgeoning), minor but influential mainstream political groups, and advocacy/activist collectives are particularly relevant here and are reviewed along with more general leadership theories that might also hold applicability, such as those related to leader and follower (and public) information processing and sensemaking under crises. The paper then concludes with some suggestions for future research directions.

Introduction

With the influential rise of the Alt-Right throughout the West, there has been a renewed interest in the leadership of fringe political groups. Although it is neither a political party nor a social movement as typically defined, the Alt-Right's influence on mainstream journalism, politics, and even governments has been indisputable. While the sensational political approaches of the Alt-Right have been garnering a large amount of recent press, there has been less work investigating the leadership processes within these forms of socio-political vanguards. Although some references have been made to the leadership of and within these groups in the social movement literature, very little has been done in other literatures; and of the work that has been done, much of it has often been peripheral to other investigations, with the focus of these prior studies being primarily on issues apart from the leadership of vanguards. Given the important role of leadership of vanguard groups in today's political environment, a review and integration of this past work with more recent leadership research is overdue.

This paper will begin by reviewing what literature exists regarding the leadership of socio-political vanguards, as well as what additional literature exists that may also be relevant to better understanding the phenomenon of vanguard leadership. Vanguard leadership will then be placed within the historical context and goals of past vanguard groups.

This analysis will then lead to further defining some of the components of vanguard leadership along with a review of typically associated leadership behaviours.

While few theories directly speak to the way in which vanguard leadership operates, this paper will also review related leadership theories that might offer meaningful contributions to our understanding of socio-political vanguard leadership. Some theories, such as those related to social movements (particularly emerging), minor but influential political parties, and advocacy/activist collectives are particularly relevant here and will be reviewed, along with more general leadership theories that might also hold applicability, such as those related to leader and follower (and public) information processing and sensemaking under crises. The paper will then conclude with an evaluation of the extant literature and some prescription for future research directions.

Some key questions that this paper will address include:

1. What are socio-political vanguards and what constitutes vanguard leadership?
2. What are its goals?
3. What does vanguard leadership look like (i.e., what are behaviours that might typically be associated with vanguard leadership)?
4. What existing theories might help explain and help us better understand vanguard leadership?

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5. What further research and theoretical development could we be doing?

Socio-political vanguards – definitions and historical background

The definition of a socio-political *vanguard* (in French, *avant-garde*) is one that has evolved quite a bit since Lenin – one of the first to popularize the term in its political sense – began to theorize and apply it as a strategic approach back in the early 1900's. The term has roots in military expeditions – it described the most forward unit that would disrupt the enemy and secure ground in advance of the main army. Lenin later developed the idea of a vanguard as a party (*en avant*) comprised of dedicated members - often intellectuals and activists - whose primary purpose was to spread Marxist concepts and educate the proletariat in Marxism, while disrupting the status quo; in Lenin's case, the status quo being the Imperial Russian government (Lenin, 1973).

Since then, the term vanguard has evolved to include groups of intellectuals and activists that work towards spreading their own particular brand of political ideas (whether Right, Left, or other), often through propaganda and other forms of agitation, in an attempt to subvert and overthrow the prevailing mainstream culture and – ultimately – the political establishment. Given the importance of the communication function within the vanguard approach, it is little surprise that a large number of contemporary socio-political vanguards have either emerged from cultural vanguards or have had a strong cultural component. Groups such as the Futurists¹ and the Situationists² were both initially aesthetic movements that eventually grew to incorporate and extend socio-political elements.

Drawing from its military pedigree, the term as presently used also suggests a separate unit and one that is in advance – more forward – than other groups engaged in a similar fight, albeit to a more moderate degree and in quite different environments (i.e., the hostile front that a vanguard typically contends with as contrasted with a more benign rear area); in the socio-political sense, this implies that a vanguard is “ahead of the characteristic beliefs and norms of the wider society” (Wood, 2002) and in direct contestation with those status quo beliefs and norms, while the larger social movement is more moderate and in-line with the public's belief, values, and worldview.

¹ Futurism promoted a “dynamic modernization” (Wood, 1999, p.196); its advocacy of violence contained both anarchist and Fascist elements. Filippo Tommaso Marinetti (1876–1944) authored the 1909 *Futurist Manifesto* which advocated for the violent rejection of traditional forms of art in favor of the incorporation of modern technology and the use of violence as artistic methods. Italian Futurism as an avant-garde soon became widespread across Europe during the inter-war period. Marinetti wrote *Fascist Manifesto* in 1919 and later became an active supporter of Mussolini. Marinetti himself actively supported the Italian fascist regime and volunteered for military service during WWII. He became a notable force in developing the party philosophy throughout the regime's existence but did not insert himself directly into political life (Berghaus, 1996).

² The Situationist International (SI) was an international social revolutionary organization active from 1957 to 1972 made up of avant-garde artists, intellectuals, and political theorists, founded by Guy Debord. While the intellectual origins of the SI were rooted in Marxist critiques of capitalism the underpinnings of this critique also absorbed into this a rejection of spirituality, hedonism, and avant-garde art movements of the first half of the 20th century. Debord (1931–1994) was a French writer, artist, and theorist who authored the 1967 book *The Society of the Spectacle*; both this book and Debord himself are frequently cited as having been highly influential towards instigating the May 1968 student uprisings in France, where both students and SI members occupied universities as a revolt against modern-day capitalist exploitation. The central activities of the SI targeted the spread of commodity fetishism, or the ‘spectacle’ – meaning the reliance on objects rather than expression to mediate social relations – into every aspect of life and culture (Home, 1991). Although Debord's name is often associated with the 1968 uprisings, he himself did not participate directly in partisan electoral politics.

This in fact is a key differentiator between vanguards and their counterparts, social movements; as has been noted by Bill Moyer, McAllister, and Finley (2001), “Movement activists will be successful only to the extent that they can convince the great majority of people that the movement, not the elite power holders, truly represents society's positive and widely held values and sensibilities.” He goes on to note that “movements are self destructive to the extent that they are defined as rebellious, on the fringes of society, and in opposition to the society's cherished core social values, symbols, rituals, beliefs, and principles.” This latter warning of course is an apt description of vanguards. While behaving in such a way would be self-defeating for many social movement leaders, these defining factors are often levers of profound influence for vanguard leaders.

This division speaks to the evolving perspective on vanguards as groups that are somewhat autonomous (in the modern use of the term – not directly, or at least publicly, affiliated with an established political party or mass social movement) and not inherently a direct part of the political process. Rather, vanguards work to shift public consciousness to set the stage for other individuals and social movements to effect political change. Political parties are typically defined as organizations that seek to influence public policy by getting its candidates elected to public office. Party members share the same ideology and run electoral campaigns based on political platforms linked to this ideology. In this respect, political parties are entrenched in the structures of society and serve to link governmental institutions to elements of civil society. By contrast, vanguards also work to gain the attention of the mainstream public, but not as an institutionalized group or political party – they often diverge from party politics to concentrate their impact on shifting cultural and political norms or ‘public mindshare’. Vanguards do not see themselves as participating members of the status quo political process and typically do not have as a goal becoming a part of it in the immediate future.

While vanguards are sometimes similar to interest and activist groups in some of their tactics, their missions generally account for more than one issue – they often have an entire worldview they are trying to bring to fruition, one that is typically utopian (Lindholm & Zúquete, 2010). And while the propaganda and agitation that vanguards put forward often lends support to some social movements and/or their primary political goals, it is important to draw distinctions between the actions of vanguards and those of mass social movements as they often quite differ in how they work to achieve political objectives, particularly in terms of mission, strategies, and tactics.

Historical reviews of past social change sometimes further muddy the distinctions between different leaders involved in these periods. While hagiographies of prominent social movements often describe leaders as ‘vanguards’ at early stages in their movements (thereby lending credibility to their reputations of integrity, courage, and tenacity), many such leaders actually espoused positions that, while certainly challenging, were still more moderate and socially acceptable forms of vanguard positions of the same period (for example, Mussolini's more moderate form – fascism – of Marinetti's Futurism, or Martin Luther King's civil rights movement as compared to Malcolm X's black nationalism). This conflation of vanguards with the beginning phases of social movements further overlooks a key strategic pillar of vanguards that was developed as far back as Lenin: namely, that vanguards are best employed as levers for change when *juxtaposed* with mass social movements. In effect, as vanguards open up political space in the consciousness of the public through direct contestation, mass social movement agendas appear less challenging/extreme.

Similarly, while some mass social movement leaders have been erroneously labeled vanguard leaders due to loose criteria and historicization of the beginnings of social movements, the proper definition and delineation of vanguards has also suffered from later violence committed by some vanguard groups. This has led to further confusion, leaving the categorization of some vanguard leaders to either ‘social movement leader’ or ‘terrorist leader’, instead of more tightly defining

the boundaries between these groups (i.e., a group definitively moving into a distinctly different phase and thus category).

In the strictest sense, the primary goal of a vanguard is not to lead social movements, nor to commit violence, but to help shift the public's consciousness to such a degree as to make it more amenable to future political propositions that would lead to the vision that the vanguard espouses. Those realized political propositions, however, and the social movement and/or political party that might share or adopt them, are not the goal of a vanguard to propose or to become (and nor should it be – as the tactics typically employed by effective vanguards are extremely contentious, there is often little political capital remaining to build a subsequent mainstream movement and/or campaign).

Further, being the leader of a vanguard requires a particular set of complex skills that do not always translate to the equally complex leading of mass movements and/or political parties – there are few people that have the cognitive complexity as well as the wide-ranging behavioral repertoire to be effective as leaders in all of these environments (Aminzade, Goldstone, & Perry, 2001; Suedfeld & Rank, 1976). As a result, the general fate of most vanguard groups is not to transition to more mainstream political or even cultural success, but to either fade into obscurity if they fail to shift the public's consciousness, or to have their agenda co-opted by more mainstream movements (such as the case with Futurism and fascism) if they are more successful.

Some recent examples of such vanguards include (but are not limited to) the Situationists and the Alt-Right. Both of these groups have proven to be very influential with inserting ideas into mainstream social and political debates, and have at times even created physical activity (such as demonstrations or protests) that have disrupted mainstream societal expectations.

Attending to vanguards as a unit of study for the purpose of examining leadership roles and strategies within these groups is important for a number of reasons. First, while infrequently attended to in the literature, the leadership of vanguards remains a very visible and noteworthy subject of study that numerous disciplinary areas could shed important light on; and yet, it has rarely been the primary focus of investigations and has often been subsumed within other studies (social movements, history of political groups, the psychology of ideology and social change). Second, the influence of counter-cultural socio-political groups appears to be a growing and significant force in shaping contemporary political debates and expectations. This is evident in the way in which the Alt-Right, to name just one recent vanguard, has made such a strong impact on North American political discourse in the past couple of years; its use of the Internet in spreading information and platforms for sharing ideas has been extremely influential. In contrast to political parties which have typically wielded influence through campaign donations, promotion by public news, and electoral success, many of the present-day social issues that have been taken up and worked through by the public began with vanguard members using anonymous forum boards, Twitter hashtags, and social networking.

Third, the number of these groups also appears to be growing, with multiple groups vying for public attention and warring both with themselves and the public. And finally, while the long-term effect of some of these present-day groups such as the Alt Right has yet to be determined, there is plenty of evidence that past vanguards, such as the Situationist International, have played an important role in helping to shape and inform the political landscape that we live in today.

Given these factors, a review which would primarily concentrate on these forms of vanguards and, in particular, the way in which leadership operates within these groups would appear to be of some present value. Although not all leaders of vanguards go on to command political power (given the confrontational approach of vanguards, this is often not an option), these forms of leadership have certainly been very influential and thus warrant further investigation.

Vanguard leadership – context, goals, and levels of analysis

While the Alt Right has created a unique stir in the past couple of years (and continues to have a presence), the Alt Right as a political vanguard is not as novel an entity as some journalists today might suggest. Vanguards on the political *right* (meaning, right-wing) have not held as prominent a place in the public eye since the 1930's, but the history of socio-political vanguards in general is quite lengthy. Although a somewhat 'modern' phenomena (meaning, since the onset of modernism), there have been a series of vanguards that have been very influential culturally and politically since at least the early 1900's.

Arguably one of the most influential socio-political vanguards within the past fifty years was the Situationist International (SI). Led by Guy Debord, the SI is often credited with being one of the primary instigators of the civil unrest of May 1968 in Paris, France. The SI began as an artistic avant-garde, creating works of art that were in contestation with the forms and meaning of the prevailing aesthetic and cultural styles of the day (Hussey, 2001; Kaufmann, 2006; Marcy 2015; Merrifield, 2005). They then moved into a political phase in which they adopted a central mission of combatting the "commodification and domination of social relationships in Western society by the media and other cultural productions of the status quo, leading average people to live disconnected and increasingly meaningless lives that are in essence 'scripted' by elites and intended to serve them" (Marcy, 2015, p. 373-374).

After moving into this political phase, Guy Debord and the SI shifted their artistic efforts towards creating unique socio-political strategies and tactics, which they then used to attack the hegemony of status quo power. Some of these tactics included détournement (the art of removing text and other elements of graphic design within mainstream publications and replacing them with text informed by their own political viewpoints), extreme public displays (in which they would capture the public's attention through outright provocation), and the 'construction of situations,' which involved the creation of social experiences that would be free of or subvert the contaminating influence of status-quo notions related to everyday ways of living (such as those primarily based on status-laden, market-driven desires).

The Alt-Right has clearly drawn from this legacy and has incorporated a number of these same tactics (albeit with a different political foundation), such as:

- the execution of subversive cultural approaches, such as détournement - some Alt Right members, such as Walt Bismarck, have 'detoured' Walt Disney films and replaced their dialogue with Alt-Right memes associated with immigration and IQ;
- the development and dissemination of coherent social theory (as in the works of Richard Spencer and Jared Taylor);
- extreme public displays - as evidenced by the provocative public appearances of Alt Right leaders like Richard Spencer);
- and the construction of situations which undermine and subvert status quo social assumptions – as developed through various real-world trolling initiatives such as the "It's ok to be white" poster campaign.

All of these tactics serve an important function in breaking the public's "false consciousness" (i.e. "a way of thinking that prevents a person from perceiving the true nature of their social or economic situation"; Gramsci, 1971; Stevenson, 2010). This is an important first step in achieving the primary goal of a vanguard: to shift the public's consciousness to a state that is more amenable to the political vision that the vanguard supports. Explained more in cognitive terms, these tactics serve an important sensebreaking, sensegiving, and sensemaking function. These processes are no small matter as the outcomes of these tactics by the SI were profound: the student occupation of the Sorbonne in May 68' was greatly influenced by evolving Situationist theory and practice (Hussey, 2001; Kaufmann, 2006; Merrifield, 2005), and the

actions of these students in turn led to the civil revolts of May 1968 in Paris, France. Similarly, the 'Alt-Lite' – the more moderate and much larger faction of a growing, US populist movement leading up to the 2016 presidential election – was greatly influenced by the Alt Right, having a high degree of overlap with their various tactics, strategies, and political positions. The Alt Lite in turn was highly influential in galvanizing support for Donald Trump in the presidential race of 2016, helping in his election.

Given the great influence that these vanguards have wielded, it bears delineating further what leadership of such a group might entail. Unfortunately, research on the leadership of vanguards has been quite limited and often embedded in larger studies of other phenomena, as well as spread across a number of literatures over time, and often conflated with other forms of leadership, to include leadership of social movements (especially 'revolutionary' social movements), activist leadership, cultural leadership (and the leadership of subcultures), community leadership (Nelson & Prilleltensky, 2005), and the leadership of marginal political groups. While all of these forms of leadership hold some relevance and overlap with vanguard leadership - along with more general research on charismatic and ideological forms of leadership, leading for creativity and innovation, and leader cognition (such as sensemaking) – none of these should stand alone as a proxy for vanguard leadership.

In moving more closely to a better understanding of vanguard leadership, as differentiated from other forms of leadership, it might be helpful to first define some goals that might be particularly unique to the leadership of socio-political vanguards at different levels of analysis.

Inter-organizational and societal level goals

The primary goal of a vanguard leader is to gain and then shift the public's consciousness to the socio-political worldview of the vanguard, thus allowing the space for later groups and movements to further particular political agendas. Doing so often means combatting the status and power of elites in well-established social relationships through the transformation of these social relationships. Given this hostile relationship towards elites, collaborations between leaders of vanguards and societal elites is often unlikely, necessitating tactical approaches such as propaganda and agitation. Specht's (1975) taxonomy of social change (see Table 1) provides some nuance as to what vanguard leaders can expect from elites when working to change the status and power of relationships within a social system. Specht suggests that there will likely be dissensus between vanguard leaders and societal elites, which in turn suggests that collaboration between the two will not likely be an option. Given the imbalance in power between the two, there is also a threat that elites may try to co-opt vanguard leaders and their ideas (a common hazard for vanguards), leaving vanguard leaders with little choice but to avoid collaborating with the 'enemy'.

Given that collaboration with elites is typically not a viable goal for vanguard leaders, as it results in a less-than-optimal outcomes, other

strategic approaches for social change need to be devised and implemented. One approach relies on influence attempts aimed directly at the public. As vanguard leaders and their immediate followers often do not have any form of institutionalized political power, they need to commit to other ways to directly influence the public, such as engaging in protest and otherwise leveraging institutionalized forms of communication, such as mainstream media channels (and now, with the Alt Right, the internet). The desired outcome is to gain the public's attention and, once this has been achieved, to then subvert their common understanding of politically informed relationships (i.e., sensebreaking), while at the same time providing viable alternatives (i.e., sensegiving) (Marcy 2015).

Gaining the attention of the public, however, is not an easy task, particularly today. There are now multiple channels of information and entertainment all vying for this very limited resource of public attention. To be able to compete with all of these other channels, a vanguard leader needs to be creative and have a firm understanding of not only public interest, but also of what tools might best be used to create novel and sensational displays that will leverage this understanding. In the case of the Situationists, Guy Debord once walked off a television set in the middle of an interview while commenting, "We're not here to answer cunish questions" (this was in response to the question, "What is Situationism?") (Merrifield, 2005). Similarly, Richard Spencer – a leader in the Alt Right – has given a number of provocative, televised speeches, one of which he infamously concluded with what appeared to be a 'Roman salute'.

This understanding and subversion of a public "mental model" has parallels to research on leader vision and the development of both a general and prescriptive mental model. In the case of vanguard leaders, it is vitally important that they not only have a strong understanding of their own mental model for prescriptive social change, but they also have a firm grounding in a more general model of public beliefs, values, and political assumptions (Caughron, Shipman, Beeler, & Mumford, 2009). Situationist critiques of mass political understanding, most notably in the development of notions such as the 'false consciousness' of the working class, reflect some of this distinction between prescriptive and general public mental models; as do some of the critiques made by Richard Spencer on the difference between adopting an avant-garde position in political struggles and one that is more mainstream, as in his commentaries on the political trajectory of Paul Nehlen.

In developing an understanding of both of these models, a vanguard leader is then better able to create and implement strategic approaches that can effectively subvert elements of the public's general mental model, which in turn will then provide the space to offer viable political alternatives. In effect, a vanguard leader's task at the societal level is to first 'sensebreak' a general public mental model of how social and political relationships work, and then help move the public towards a prescriptive mental model through sensegiving (e.g. vision creation and implementation) (Foldy, Goldman, & Ospina, 2008; Gioia & Chittipeddi, 1991; Maitlis, 2005; Maitlis & Lawrence, 2007; Pratt, 2000). In doing so, they are not only calling attention to and making salient particular social and political problems, but they are further providing solutions to those problems.

Group level goals

Given the size of the primary goal at hand – the shifting of the public's consciousness towards the worldview of the vanguard – a vanguard leader will need a group of dedicated followers to help in accomplishing this goal. As this goal requires a high level of intelligence to understand, as well as creativity to generate and implement effective strategies and tactics for dealing with it, it's little surprise that vanguards are often comprised of innovative intellectuals, activists, and artists. With these types of group members, a vanguard leader will need to know how to be effective in leading other creative people in teams (Basadur, 2004; Byrne, Mumford, Barrett, & Vessey, 2009; Mumford,

Adapted from Specht (1975).

(Scott, Gaddis, & Strange, 2002), as well as providing the requisite autonomy for others to exert leadership, both within the team as well as with external constituencies. As these members are often highly capable and do not typically suffer from a lack of options, vanguard leaders must be up to the challenge of dealing with the some of the usual internal threats that can occur in creative groups (such as petty bickering) as well as external threats (such as members being attacked and/or swayed by elites to abandon their vanguard positions). Vanguard leaders must help provide resources that enable the team to do its work, to include the provision of emotional resources (such as emotional support during times of acute stress) as well as financial resources, when possible. They must also help establish networks that link to other groups of like-minded others and create useful alliances.

An additional related leadership task is for vanguard leaders to provide exemplary role modeling to their immediate followers along with the general public, and to act as a living embodiment of the alternative political views that they are espousing. This example, especially if picked up by vanguard group followers, can also further serve as a "demonstration project" to the public (Mumford, 2002), effectively providing an enticing subculture for other potential members to consider adopting and enacting. These new ways of working and living help validate the superiority of the socio-political approaches and identity that the vanguard group is proposing. Likewise, the vanguard group can also be a way for a leader to further test and refine hypotheses related to these approaches.

Individual level goals

At the individual level, vanguard leaders need to be able to create and implement novel strategies and tactics that will help gain and then shift the public's consciousness in the direction of the social and political worldview that they are trying to bring into being. This will require the employment of a set of cognitive skills that will help with creativity and social innovation, such as effective forecasting and problem identification, as well as having a foundation of expertise on which to build new mental models of, as well as new approaches to, their community's problems.

Additionally, vanguard leaders need to provide through their own analysis and behaviour a clear example of why their approach to social and political life is superior to the existing paradigm. They need to convince followers and potential followers that they are someone worth following. As suggested by Shanteau (Shanteau, 1992; Shanteau, Weiss, Thomas, & Pounds, 2000), it is not enough that someone has the knowledge of an expert – they must also look like and behave like an expert, which is to say that they have the expected cognitive and behavioral repertoire of a leader worth listening to.

Finally, as they are social and political outsiders, vanguard leaders need to maintain and defend the integrity of their individual and group identity, vision and platform in the face of sometimes-great opposition by status quo institutions, such as the media, mainstream political parties, and governments. This means that they need to have and maintain a certain resilience when meeting mass condemnation.

Towards a model of vanguard leadership

A diagram of a model of vanguard leadership is shown in Fig. 1, which illustrates two primary routes of influence that vanguard leader attributes can have on effecting change: the route of leader influence on groups and group membership, which in turn affect mass society norms and values; and the route of leader influence directly affecting mass society without the intervening group variables. Change in this context refers to 'sensebreaking', 'sensegiving', and 'sensemaking', which together comprise a process of the public adopting new ideas and beliefs about the larger socio-political setting, some of which may contradict earlier status quo norms and values. The figure provides a representation of the effects of vanguard leader attributes into three basic

components: the level of individual leader behavior, the level of group behaviours, and the level of mass society behavior/outcomes. Before going into the model in detail, we first introduce its components below.

The first route identifies vanguard leader attributes within a group setting as being relevant for strategic planning and culture-setting, both in terms of the social/political/ideological parameters of the group as well as the group's organizational culture within and amongst the group members. The antecedent implications of the group members (personality variables, cognitive skills, identity, and worldview) interact with leadership attributes to shape the outcome behaviours of the group. These group behaviours include the creation of authoritative texts, the re-purposing of existing cultural symbols into new representations of the vanguard (detournement), and worldview and lifestyle shifts. These in turn influence outcomes on mass society beyond the groups, in the form of large-scale public sensebreaking, sensemaking, and sensegiving.

The second route identifies the interaction of vanguard leader attributes with a leader's behavior within the public space and not within an internal group setting. Such behaviours include public speeches and other displays of expertise, the publishing of authoritative texts, a publicly unyielding and uncompromising position on socio-political issues and official displays of commitment, and other potentially sensational public displays which challenge acceptable status quo public behaviours. The outcomes on mass society – change in norms – are the same as those via the first route but bypass the element of a group setting, going directly from the leader to the public.

The background setting of the general socio-political context provides an important contextual factor in this model of vanguard leadership, by way of providing the climate for which certain issues are more or less relevant. This background can include economics (public financial austerity or economic growth), the presence and severity of 'crises' (natural or man-made disasters), the general ideological worldview (for example, the importance of democracy), the political landscape (the number of political parties, the presence of fringe parties, the level of divisiveness between parties, general political orientation), and the presence and substance of other vanguards and social movements within mass society.

Vanguard leadership traits, skills, and behaviours

Due to issues such as the muddiness of definitions of vanguards, along with vanguard leadership being conflated with other forms of leadership such as 'social movement leadership', there are few studies that can be said to have definitively focused on the different traits, skills, and behaviours of vanguard leaders. This is not to say that some studies have not come close though, particularly those that have focused on 'revolutionary' or 'rebel' leadership.

Two excellent research studies on the theme of revolutionary leadership – *Rebel Leadership: Commitment and Charisma in the Revolutionary Process* (1973) by James Downton, and *Leaders of Revolution* (1979) by Mostafa Rejai and Kay Phillips – highlight some of the strengths and weaknesses that can more generally be found in the literature when trying to define and better understand vanguard leadership. Both of these studies provide individual, group, and societal level criteria that are important to consider when attempting to define vanguard leadership, such as the important roles that personality, motivation, and context respectively play in these forms of leadership. Downton's *Rebel Leadership* attends more to vanguard leadership as the role is more tightly defined within this study, while the other – Rejai and Phillips' *Leaders of Revolution* – does in fact speak more to revolutionary leaders of mass movements. Although both cover Lenin, who was one of very few leaders who was both a mass movement leader and a vanguard leader, both researchers spend the rest of their studies covering quite different leaders.

In their study, Rejai and Phillips note that defining and identifying principal revolutionary leaders was more difficult than they expected, and they go on to note that they ended up needing to distinguish "the

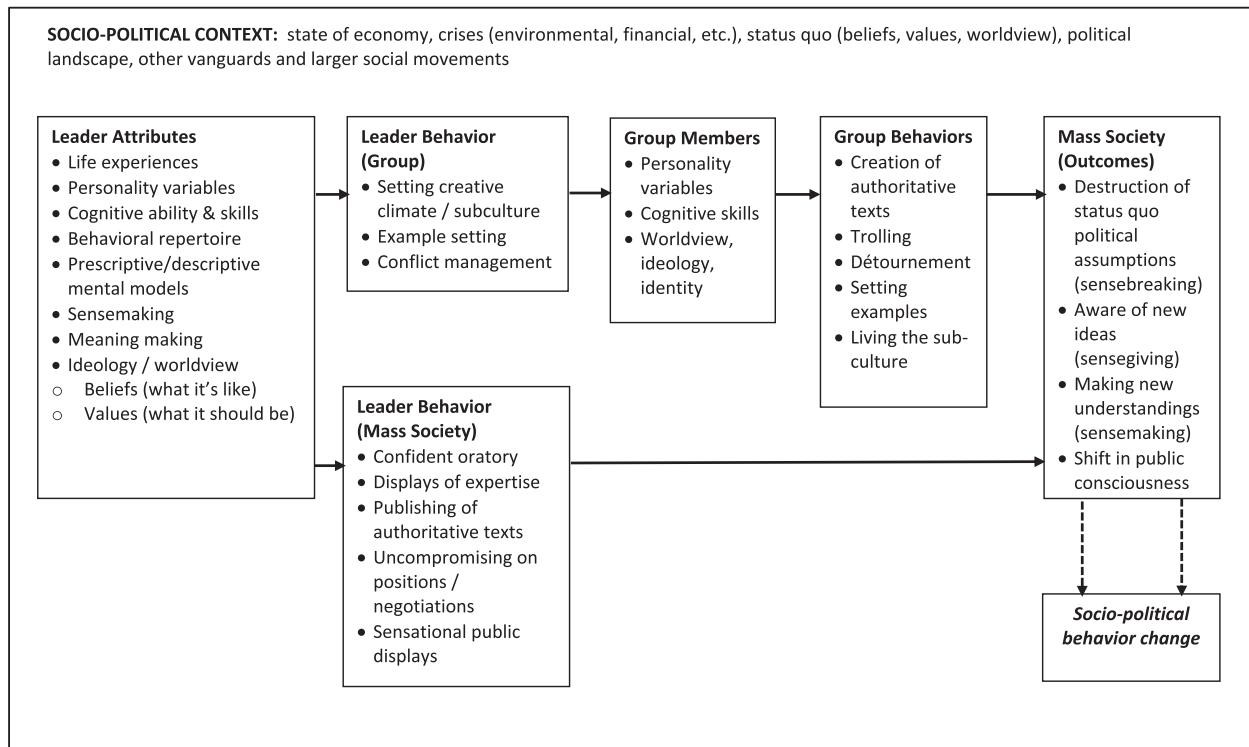


Fig. 1. Model of vanguard leadership.

'real' revolutionary [leader] from the dilettante, the propagandist, the pamphleteer" (p. 13). These comments speak to some of the issues raised earlier with the conflation of vanguard leaders with mass social movement leaders: while few people would heartily accept being called a dilettante, both propagandist and pamphleteer are roles that vanguard leaders would immediately recognize and acknowledge that they need to regularly fill. Interestingly, in a review of the revolutionary leaders that Rejai and Phillips covered, they have done well in *not* including/conflating vanguard leaders with 'revolutionary' leaders of mass social movements. For example, in their review of leaders that were involved with the events in France, May 68', they note Daniel Cohn-Bendit and Alain Geismar (two social movement leaders of the period) but fail to note Guy Debord or Raoul Vaneigem (two vanguard leaders in the same period). This can be contrasted with Downton's "Rebel Leadership" qualitative study wherein he also was investigating 'revolutionaries' (and also covered Lenin), but gave more prominent coverage to leader such as Malcolm X of the Black Muslim movement (a leader of a vanguard) and Marian Keech of the "End of the World" movement (another leader of a vanguard).

Although there have been few studies that have had vanguard leadership traits, skills, and/or behaviours as a primary focus (the above being notable exceptions), there have been a number of historical reviews conducted on many of these vanguard leaders, sometimes resulting in rich case studies that can be mined for clues as to what traits, skills, and/or behaviours these leaders might have had. Through analysing these historical reviews, we can begin to determine the different components of vanguard leadership at the individual, group, and societal levels.

Individual level traits, skills, and behaviours

Early life experiences

In reviewing the histories of past vanguard leaders, it becomes clear that many of them were forced to work through what Rejai and Phillips (1979) refer to as 'relative deprivation and status inconsistency'. Guy Debord, leader of the vanguard *Situationist International*, suffered a

number of hardships as a young child. Debord's father died when Debord was only four years old; this then led to his family losing their fortune and descending into poverty (Merrifield, 2005). His father's death, the loss of his family's fortune and status in society, coupled with the turbulence from World War II, very likely contributed to Debord's character. Debord made numerous mentions of his childhood in his work, often noting that he had seen "nothing but troubled times and immense destruction" (Debord, 2004) (Kaufmann, 2006).

This same level of relative deprivation and status inconsistency is noted amongst other vanguard leaders as well. While maintaining excellent grades in school, Malcolm X often spoke of the crime and drugs that were also a part of his daily life in the neighborhood he grew up in as a child; similarly, many leaders of the Alt Right have spoken of the drug crisis and general decline of status of whites they feel has taken place within their own neighborhoods over the past couple of decades.

These types of catalyst events have been shown to have large repercussions for future leadership in the leadership developmental literature (Ligon, Hunter, & Mumford, 2008; Moxley & Pulley, 2004), impacting attitudes, cognitive development, and behavioral skill development.

Traits and attitudes

While it can be difficult to disentangle the development of particular attitudes and traits from some of these formative experiences, and whether they would have been inherent and/or further developed without these experiences, it is clear that many vanguard leaders share some of the same attributes. For example, it is clear that vanguard leaders would not rate very highly in Agreeableness on the Big Factor Five personality assessment; given the contentious nature of the mission of a vanguard, it would seem that this would come with the territory. Similarly, it would seem that vanguard leaders often contrast with social movement leaders in their degree of extroversion, with vanguard leaders, such as Guy Debord and Malcolm X, being somewhat more critical of everyday social life, or in the least, more socially-removed (i.e., introverted) than social movement leaders, who seem to be more positively energized by engagement with the public. It is also likely that

most vanguard leaders would not be very high in need for social acceptance, as well as in conflict avoidance.

Given that many historical reviews of vanguards and vanguard leaders are either thinly veiled hagiographies or denunciations, it is difficult to determine how highly these leaders might rate on different personality factors, such as the Light (Kantianism, Humanism and Faith in Humanity) and Dark Triads (narcissism, Machiavellianism, and psychopathy). Vanguards do not typically suffer from a lack of very passionate supporters or detractors either, making it sometimes difficult to more objectively determine how these types of leaders might rate on these factors. Drawing from the extremist literature (a literature that also somewhat suffers at times from conflating violent radicals with vanguard leaders), it's been suggested that serious psychopathology is rare amongst these types of radicals (at least on the Right where these investigations have taken place) (Caiani & Borri, 2016), and it is further unlikely that an "extremist personality profile" will ever be found (Hafez & Mullins, 2015).

As might be expected, given the history of a number of socio-political vanguards emerging from artistic vanguards (such as Dada and Futurism), many vanguard leaders seem to have an "aesthetic and/or romantic streak" (Rejai & Phillips, 1979). For example, Guy Debord was an artist before, during, and after his leadership of the S.I. (Hussey, 2001; Kaufmann, 2006; Merrifield, 2005). More surprising, however, might be the artistic leanings of leaders of the Alt Right, a connection that has been far less publicized. For example, Richard Spencer has repeatedly referred to past vanguards throughout his career, whether through the naming of his internet podcasts (i.e., "Vanguard"), his suggestions that he always wanted to become an "avant-garde theatre director," or in his discussions with other members of the Alt Right of past artistic and socio-political avant-gardes (Marcy, 2019, in press). Others, like Ramz paul (a popular Alt Right vlogger), have directly made references and comparisons to 'samizdat' (a Soviet-era political dissident publishing practice) in relation to Alt Right information dissemination; another Alt Right leaders, Greg Johnson (head of Counter Currents, a key Alt Right website), has just finished writing a 'manifesto' for the movement (a manifesto being another strategic tool that has its roots in earlier artistic vanguard approaches). Millennial Woes, in a recent podcast, even went so far as to suggest that the Alt Right is an art movement.

These artistic leanings suggest that vanguard leaders may be taking in different types of information than the norm (Ansburg & Hill, 2003; Smith, Ward, & Finke, 1995), such as information related to aesthetics and power, which often inform the ways in which people build their worldviews. An awareness and facility with these forms of information may be another fundamental difference between typical political leaders and vanguard leaders. As outsiders, vanguards may have a perspective on status and social aesthetics that is arguably deeper than many status quo political leaders.

Cognitive skills

Drawing together these attributes with the previously discussed life experiences, it is easier to see how past vanguard leaders might have been motivated to develop particular cognitive skills that would then later help them to be more effective in their roles. For example, given their background and traits, it is likely that they might develop multiple mental models of how society might effectively 'work'. This may be yet another differentiator between vanguard leaders and some other types of leaders: the depth and breadth of alternative mental models available to draw from and combine (Scott, Lonergan, & Mumford, 2005). Malcolm X spoke frequently of the different worlds that whites and blacks live in, despite living in the same community, while Guy Debord often detailed the struggles between social and economic classes, highlighting their great differences. As a parallel, Alt Right intellectuals have frequently made mention of a large divide between social elites and the white working class.

As elites have little incentive to venture out of the status quo, their

understanding of the issues of those from less privileged backgrounds becomes more limited. Many vanguard leaders, who have had wider-ranging experiences due to the status inconsistency discussed earlier, could arguably have richer informed models, as well as unique heuristics for problem identification. Some empirical support for this comes from a recent study of sensemaking which found that the "more an actor's cultural capital is privileged by existing organizational schemata, the more likely it is that his or her disposition toward profession-centrism will promote sensemaking about organizational change that will not disrupt existing organizational schemata." (Lockett, Currie, Finn, Martin, & Waring, 2014). Research on marginalization and status quo deviance further supports that 'outsider' experiences can lead to the richer development of alternative mental models and heuristics (Förster, Friedman, Butterbach, & Sassenberg, 2005; Kim, Vincent, & Goncalo, 2013; Runcio, 1999; Simonton, 1994; Simonton, 1999).

One often overlooked advantage to having personally experienced deprivation and status inconsistency is not only in having a fuller understanding of the experience so as to more effectively solve similar problems, but also in the building of coping skills to surmount future challenges. These enhanced coping skills then in turn build a resiliency that can be very helpful in facing future status quo rejection. Facing rejection head-on is no small task, as it is a considerable challenge to adaptively work through it (Leary & Terdal, 1995). Given that contestation and social rejection is a fundamental part of being a vanguard leader, it's important that leaders of such groups have considerable resilience. Having had past life experience with social rejection, and having overcome it, especially when it is considered to be unjust, may very well be the experiences that vanguard leaders need to face future challenges to the status quo.

Group level traits, skills, and behaviours

Team leadership

Most past vanguards have been comprised of a small set of very committed members (typically no more than twenty), with other associates filling roles of 'allies', meaning that they generally serve as more of a support function. As originally conceptualized and implemented by Lenin, subsequent vanguards have typically been comprised of intellectuals, artists, and activists. The Situationist International, as led by Guy Debord, was no exception to this and was primarily made up of painters, filmmakers, and architects, with some playing a primary role as political theorists. They hailed from a number of different countries, as well as class backgrounds. Being able to draw from these varied skill sets and knowledge structures likely contributed to their creative output (Kabanoff & Rossiter, 1994; Mumford et al., 2002). As an artist himself, Debord was able to draw from his own experience when executing particular leadership tasks at hand, such as distributing resources effectively to followers (Byrne et al., 2009; Marcy, 2015; Mumford et al., 2007). This is no small point as resources are typically limited in vanguard operations and vanguard leaders need to well understand the roles that they are asking others to fill. Leaders of other vanguards such as Richard Huelsenbeck (Dada) and Filippo Tommaso Marinetti (Futurists) were all artists as well.

Important resources that vanguard leaders must weigh and consider include not only financial support but emotional and intellectual matters. Creative and intelligent people, as those often found in vanguards, need a high degree of autonomy to fulfill their tasks. Vanguard leaders, similar to scientists and artists, must cultivate a careful balance between allowing creativity to manifest itself in tasks and ensuring that standards are met. Some vanguard leaders, such as Guy Debord, have maintained this balance by allowing great latitude on the development of a task on one hand, but expelling those from the group that did not meet particular standards or did not deliver on a particular project (Kaufmann, 2006); while vanguard groups, like the Alt Right, have maintained commitment and exclusivity through the sheer offense of their platform (i.e., people need to be committed just to be a member of

the group). This management of deviance to internal group norms extends to the effective management of deviance in the wider society. Group members of vanguards are typically under a great amount of social pressure to conform and this is something that needs to be further managed by vanguard leaders.

This exclusivity of vanguards contrasts sharply with social movement and political party approaches, which tend to work towards accepting as many people as possible into their ranks and making as many concessions as is possible to accommodate them, sometimes even going so far as to render their agenda unrecognizable from its beginnings. In contrast, Guy Debord turned more people away from the S.I. than he welcomed (Kaufmann, 2006). There was a regular purging of the ranks of the S.I., and once someone was expelled, Debord never admitted them back. He notes in his autobiography that he “never sought out anyone, anywhere” and that his “entourage [was] composed only of those who came of their own accord and were capable of getting themselves accepted” (Debord, 2004). Similarly, groups such as the Alt Right have even fashioned jargon around the purging of members, creating the terms “cuckservative” and “Alt Lite” to define those that don’t meet the ideological standards of the Alt Right.

Unlike social movement or political party leaders, vanguard leaders tend not to make concessions to deviations. This style of team leadership is particularly harsh, but there are elements to this approach that are arguably adaptive. Vanguard groups are often under constant threat by elites within social and political systems, whether it be co-optation of their agenda or, even more extreme, attempts at violence. There is literature, however, that suggests that there are ways in which a minority group can counter these threats by maintaining a close-knit group of loyal members (Nelson & Prilleltensky, 2005).

One is by sending clear signals to potential members of their compatibility with the group by purging incompatible others (Graen & Uhl-Bien, 1995). Another is by presenting a strong and unified front to the status quo. While some research suggests that there will likely be short term losses in these approaches, it also suggests that there will also be larger gains in influencing the majority over the long-term (such as the conversion of majority beliefs to minority logics) than if a more incremental approach were taken (De Dreu & West, 2001; Moscovici, 1980).

Team behavior

As an instrument of leader influence, vanguard groups are not only representatives of new socio-political relationships, but they are also agents of change in helping to shift public consciousness. Debord along with the S.I. created and implemented a number of tactics with which to directly attack status quo understanding of the social environment along with providing solutions. These tactics, such as detournement and the “construction of situations”, were designed to break social norms and help people reconnect with themselves, each other, and their environment in ways that were not directly or implicitly socially engineered by the status quo (Marcy, 2015). With detournement, the S.I. would strip the dialogue from cultural objects, such as comics and films, and replace this dialogue with S.I.-informed theory. With the Alt Right, Walt Bismarck has repurposed old Walt Disney movies in the same way to help spread Alt Right ideas related to IQ and immigration. In a similar fashion, Alt Right ‘trolls’ (anonymous members of the Alt Right) have helped spread their message on the internet through the use of provocative “memes”, further co-opting status quo cultural objects.

The S.I.’s ‘construction of situations’ was an attempt to create social situations that were free from the contaminating aspects of elite social conditioning; to jar people out of their false consciousness, and thus help them create more meaningful social relationships (Debord, 1967; Debord, 2009; Kaufmann, 2006). In a similar fashion, anonymous members of the Alt Right have instigated a number of “real world” interventions, such as the “It’s OK to be White” campaign; a poster campaign which was designed to provoke the public and prompt white identity consciousness. Through these social and cultural engagements,

vanguard leaders are hoping that they are ‘waking people up’ (i.e., sensebreaking) and offering them an enticing vision (sensegiving) of how new social relationships might work.

Inter-organizational and societal level traits, skills, and behaviours

Vanguard leader as credible public figure

Being a vanguard leader in the public eye is somewhat of a balancing act akin to the balancing act implied by some theories of humor (this comparison is no small point, as humor has often played an important role in vanguard strategy and tactics). Some theories of humor, such as benign violation theory (McGraw & Warren, 2010), suggest that humor may come from moral violations that are simultaneously seen as benign; said another way, for something to be funny, it needs to both break moral norms *and* be acceptable on some level. Similarly, for a vanguard leader to be optimally influential, they need to not only be someone who is provocatively breaking the norms that society espouses, but – at the same time – also need to be a credible public figure (i.e., someone who is, at least on some levels, a socially acceptable person).

As vanguard leaders are in contestation with the status quo and status quo institutions, there are many forms of power and influence that are not under their control, such as reward power or coercive power, and thus cannot help in establishing their legitimacy (Yukl, 2009). To be influential with the general public, vanguard leaders must work towards acquiring and leveraging other forms of power, such as informational and expertise power. To be a true expert in the eyes of the public, however, is more than just having an important and helpful body of knowledge and skills at the ready; a vanguard leader must also look and behave like an expert to be accepted by the public as one (Shanteau, 1992; Shanteau et al., 2000). This means that a vanguard leader must take steps to executing behaviours that the public would recognize as being those of an expert.

One way in which a vanguard leader can more readily be accepted as an expert is in the publication of authoritative texts (Marcy, 2015). As head of the S.I., Guy Debord wrote several highly influential books, the most important arguably being *The Society of the Spectacle* (Debord, 1967). In this book, Debord details some of the S.I.’s most important critiques related to commodity fetishism, the mass media, and the ‘spectacle’ – the commodification and domination of social relationships in Western society by the media and other ‘spectacular’ devices as designed and implemented by the status quo, leading average people to live disconnected and increasingly meaningless lives that are in essence “scripted” by elites and intended to serve them (Hussey, 2001; Kaufmann, 2006; Merrifield, 2005). Debord also wrote or co-wrote a number of articles within the *Situationiste Internationale*, the official journal of the S.I.

Similarly, leaders within the Alt Right, such as Jared Taylor and Kevin MacDonald, have published extensively, in both the more academic, as well as in the popular, literature. Kevin MacDonald is a well-published, retired academic who has written a number of scholarly, peer-reviewed articles in addition to his popular-press publications in support of Alt Right political positions. Jared Taylor, who has also published widely, has been described by both his supporters and his critics as someone who brings a “measure of intellectualism and seriousness” to the Alt Right (SPLC, 2018), as well as having a “cultivated, cosmopolitan” approach (Roddy, 2005).

The establishment of vanguard leader credibility, to include the vision of the vanguard, is also furthered through the actions of the immediate vanguard group. As suggested in the group-level behavior analysis, vanguard groups are not only tools to execute particular leadership tasks (such as the publishing of persuasive texts and other dis/information campaigns), but they are also effective as demonstration projects, signaling to the public how and why the new norms and behaviours encouraged by the vanguard lead to better outcomes for themselves and their relationship to others (Mumford, 2002). In the

case of Debord and the S.I., a large contingent of the students of both the University of Paris and the University of Strasbourg, were clearly influenced by Debord and the S.I. Emulating the S.I. through the development of their own Situationist-based theory and praxis, some students created and disseminated the pamphlet, *On the Poverty of Student Life*, which some scholars have credited with leading to the further dissemination of Situationist ideas, and the eventual crisis of May 1968 (Plant, 1992).

In a similar fashion, leaders such as Milo Yiannopoulos of the Alt Lite – a more moderate, but larger offshoot of the Alt Right – garnered more media attention and were even more influential in creating the political space on the Right that allowed figures such as Jordan Peterson and Donald Trump to become even more prominent (Nagle, 2017). It is clear from these examples that the association with, and successful cultivation and recruitment of, other socially-credible figures, as well as the creation of a larger support bloc (e.g., students of the Sorbonne, members of the Alt Lite) can further contribute to vanguard leader credibility. The recruitment of socially credible people also helps ensure better vanguard group outcomes as these types of members are often more stable and more capable than those with no social credibility.

Vanguard leader as provocateur

While a certain amount of credibility is essential for vanguard influence, a vanguard leader's ultimate goal is not public acceptance but public provocation and eventual opinion shift. This shift is often achieved by vanguard leaders through uncompromising public debates and other sensational public displays. Along with being intriguing enough to capture and maintain the public's attention (no mean feat in any era, but particularly in our own with as many channels competing for our interest), public engagements should serve at least two key functions (although it is often enough that they serve one or the other):

1. A sensebreaking function, wherein the sensational message or messages being conveyed define and highlight status quo approaches as problematic (i.e., a provocative function); and,
2. A sensegiving function, wherein the sensational message or messages being conveyed define and highlight vanguard solutions as viable alternatives to the status quo (i.e., a credibility function).

Debord and the S.I. engaged in a number of provocative tactics in their ongoing battle with the status quo, to include their use of détournement of popular forms of media, as well as their involvement in contentious - and well-publicized – public debates. As defined in the Internationale Situationniste #1, détournement is “short for détournement of preexisting aesthetic elements” (Debord, 1958). In practice this meant taking everyday cultural materials (for example, popular magazines, cartoons, and films) and then editing them to:

1. Highlight the bankrupt nature of status quo norms and relationships; and
2. Replace status quo implied and explicit notions with text and images that would reflect Situationist solutions.

As noted previously, vanguard groups typically favor direction confrontation with elites, often through mass market media channels, as collaboration is not a viable option given their mission (Nelson & Prilleltensky, 2005). Through détournement, Debord and the S.I. subverted mass-market cultural forms by replacing status quo notions found within them with Situationist-informed solutions,³ thereby

³ For one of the more sophisticated and funny examples of this approach, please see Can Dialectics Break Bricks? by Rene Vienet: http://www.ubu.com/film/vienet_dialectics.html For a snippet, see here: <https://www.youtube.com/watch?v=IEzrMGnRST4>

helping to first break maladaptive assumptions and then promote a shift in public consciousness (Foldy et al., 2008).

Debord further promoted these shifts to Situationist ideas through often contentious, public engagements. In one of the most outrageous interviews at London's Institute for Contemporary Arts, Debord was asked in a panel, “what is Situationism?” to which he responded in French, “We're not here to answer cunctish questions,” and then stood up and walked out (Home, 1991). There was an immediate uproar and this incident went on to become infamous, thereby further catapulting Guy Debord and the Situationist International into the public eye.

This incident is a good example of Debord's ability to create provocations that capture the public's attention and continue to resonate after the incident has passed; it also highlights Debord's refusal to collaborate or be co-opted by the mainstream, to even include the attempt at public understanding through the use of terms that Debord considered constraining. It is clear from all of this that Debord and the S.I. were one of the more uncompromising vanguard groups of the past century (Hussey, 2001; Kaufmann, 2006; Merrifield, 2005).

Taking a page from the S.I. playbook, leaders and group members in the Alt Right have also engaged in tactics such as détournement, as well as been involved in contentious, well-publicized public debates. Richard Spencer and Jared Taylor have both engaged in highly controversial public debates on the topics of race, IQ, and immigration, along with hosting conferences and rallies in which Alt Right ideas have been actively promoted in both the mainstream press and social media. Some well-established members of the Alt Right, such as Walt Bismarck, have used détournement to give new meanings to old Walt Disney films, while Alt Right trolls have employed détournement for “meme-making” on the internet.

Vanguard leadership theories and future directions

Individual-level leadership theories and future directions

Earlier, it was suggested that vanguard leaders often exhibit a set of similar attributes that appear to be helpful in the leadership of vanguards. Some of these attributes included both traits and skills. In terms of traits, it's clear that it would be helpful to turn to the wider, leader personality literature to see what constructs might further contribute to our understanding of vanguard leadership. Given the contentious nature of the role, along with the inevitable social opprobrium, vanguard leaders clearly need to be resilient, as well as be able to work through potential mass social rejection (along with potential violence from both state and independent actors). Self-esteem management, particularly as a measure of positive social approval, becomes an important skill to have.

Other general traits that are likely to be important to vanguard leadership are contrarianism (Runco, 1999), conformity (Sheldon, 1999), conventionality (Pariser, 1999), as well as (a lack of) need for social acceptance. While present research seems to suggest that there are not likely to be serious pathologies amongst vanguard leaders, it is likely however that particular traits run through different vanguards, depending on their socio-political approach. For example, Alizadeh and colleagues found that a need for certainty was particularly important to some far right groups (Alizadeh et al., 2019).

This focus in the literature on members of extreme groups such as the Alt Right (Forscher & Kteily, 2017) points to a number of interesting, and potentially contradictory, future suggestions for vanguard leadership research; namely, should we expect the same personality profile from the leaders of vanguards as we do from those that are group members? For example, while some research in the creativity literature has suggested that those that hold more conservative

(footnote continued)

https://en.wikipedia.org/wiki/Can_Dialectics_Break_Bricks%3F

viewpoints are less creative (Tyagi, Hanoch, Choma, & Denham, 2018), the intellectual and artistic production of Alt Right leaders, to include the innovativeness of their socio-political tactics, would suggest otherwise. This contradiction points to the need for more research into vanguard leadership and vanguard leaders.

In terms of skills, one particularly important area to explore would be in the area of cognition; namely, leader cognition skills. As the primary goal of a vanguard leader is to prompt a socio-political shift in the public's consciousness, a strong understanding of how this process works is vitally important. Marcy (2015) has proposed that this shift can be enacted by vanguard leaders and their groups through a sense-making process. The process begins with first having a strong understanding of the general public's mental model of society and politics, as well as a prescriptive mental model that is the foundation for the vanguard leader's vision for socio-political change. The vanguard leader, along with the vanguard group, then creates and implements tactics that help 'break' concepts and relationships within this general public mental model, which then creates the space for 'sensegiving' approaches to fill the gap.

These different steps are typically served through different roles within vanguards, with front-line activists often being the 'sense-breakers' through provocative assaults on mainstream culture, and intellectuals often being the 'sensegivers' through their production of authoritative texts. While this process has been theorized, the leader cognitive skills underpinning this particular vanguard social change process have not been detailed or empirically investigated. Leader cognitive skills such as scanning and forecasting will likely prove important.

Group-level leadership theories and future directions

Similar to the individual level, the available research literature at the group-level presents a number of interesting questions and challenges in determining its applicability towards better understanding vanguard leadership. For example, vanguard leaders and vanguard leadership has much in common with revolutionary leadership, social movement leadership, and political party leadership. Within these forms of leadership, the role of charisma is often a fundamental component of leader-follower relationships, with followers often wanting to identify with, and even emulate, some of these leaders; which leaders then leverage to accomplish group goals. For vanguards, however, leaders are often as combative internally as they are externally, often sowing long-lasting acrimony, and distancing other group members; and unlike some social movements and political parties, these group members often have strong identities and social credibility, resulting in a less than a need for a charismatic relationship. If not all vanguard leaders depend on charisma to influence followers, then what do they do to achieve group outcomes?

Given that vanguards are often made up of intellectuals, activists, and artists, there is some evidence to suggest that a more pragmatic or ideological form of leadership is needed to influence group members (Mumford, Licuanan, Marcy, Dailey, & Blair, 2006). Rather than directly appeal to followers' identities, some scholars have suggested that some leaders carefully delineate category boundaries, differentiating the status quo and its interests from the interests of the vanguard. Leaders establish the boundaries of who is considered to be a part of the group and a part of the status quo, which helps to reinforce an "us" versus "them" phenomenon. With respect to contesting the status quo, leaders present a vision that reflects the collective social identity and conveys a shared alternative social reality (Subašić, Reynolds, Reicher, & Klandermans, 2012; Haslam et al., 2010). This envisioned reality "simultaneously marginalizes proponents of the status quo as 'them' while aligning the rest of 'us' with a change agenda" (Subašić, Reynolds, & Turner, 2008 as cited in Subašić et al., 2012).

The orchestration of this divide between "us" and "them" also further points to the leadership need to manage the stress that comes with

being group deviants on the outside of society (Bader & Baker, 2019; Chang, Turan, & Chow, 2015; Plucker & Runco, 1999; Williams, 2011). While there are unique, positive advantages that come with being a leader and member of a vanguard facing social rejection, such as the added fuel for creativity it brings (Kim et al., 2013), as well as added group cohesion and respect for group leaders (Linden & Klandermans, 2006), leaders of vanguards still must provide any emotional and financial resources that are available to support their followers during spikes in social disapproval.

While the present study primarily concentrated on vanguard group members for a group-level review, there are other groups that are also worthy of study to gain a deeper understanding of vanguard leadership; for example, the 'status quo' or society's elites (Milner Jr., 2015; Peffley & Rohrschneider, 2007). Both of these terms are often employed in critical analyses of vanguards (Gramsci, 1971), but are often much less defined in other disciplines and empirical studies. While there is quite a bit of research on how elites and their organizations have responded to pressure from related groups, such as interest groups (Julian, Ofori-Dankwa, & Justis, 2008), it would aid our understanding of vanguard leadership to empirically test how and in what way elites are affected by specifically vanguard positioning and tactics. Other groups of vanguard leadership research interest would be the mainstream media, political enemies (such as opposing vanguards), their base – meaning people who already support the vanguard's socio-political positions but are not active members of the vanguard or politically mobilized yet (i.e., a part of sympathetic social movements or political organizations) (Schönberger & Raemy, 2018) - and the 'masses' in general (Jonsson, 2013; Reicher, Drury, Hopkins, & Stott, 2001).

Mass societal-level leadership theories and future directions

While a large amount of theoretical work has been done on vanguard leadership in critical, art, and philosophical studies (Gramsci, 1971; Home, 1991; Wood, 2002), much less work has been done in other disciplines, particularly as it pertains to practice (Ganz & McKenna, 2017; Ganz & McKenna, 2019). The social movement leadership literature – arguably, one of the largest contributors to our understanding of vanguard leadership vis a vis social movement leadership (as suggested earlier, social movement leadership and revolutionary leadership are often conflated with vanguard leadership) – has had a tendency to focus more on constraints and other structural, rather than agentic, conditions (Ganz & McKenna, 2019; Guillén, 2010). This approach has helped in our understanding of important social movement leadership phenomena such as the role of elites, history, and networks (Ganz & McKenna, 2019), all of which play a role in better understanding vanguard leadership. This emphasis towards structure, and away from agency, within the social movement literature however has resulted in "a scarcity of research into the way in which movement leaders function" (Klandermans, 1997, p. 133).

If this is true of the social movement leadership literature in general, it is certainly true of the vanguard leadership literature. As noted before, some studies, such as Downton's *Rebel Leadership* (Downton, 1973), are – by the definitions we have provided in the present effort – studies of vanguard leadership; but these studies are few and far between. Even rarer are studies of social movement leadership that draw from more than one or two disciplines, with most reviews remaining within one body of knowledge.

Moving forward, it is clear that the investigation of vanguard leadership will have to be a multidisciplinary effort. In addition to critical theory, media studies, and political philosophy, disciplines such as sociology, psychology, political science, and cultural studies all offer important lenses in which to view vanguard leadership. For example, Rucht (2012) and Yaziji and Doh (2013) both discuss the importance of leadership, identity, and ideology in the leadership of social movements; this has strong overlap with the political psychological literature (Feldman, 2013; Jost, Federico, & Napier, 2009), which also stresses the

importance of identity in political ideology, and has further overlap with the general psychological literature on worldviews (Koltko-Rivera, 2004) – an important leverage point for vanguard leaders, as worldviews are what vanguard leaders are targeting and prompting to shift.

Research on the leadership of social change organizations (Ospina & Foldy, 2010) has suggested that prompting cognitive shifts is a key leadership practice, a practice that is supported by the use of key leadership cognitive skills, such as sensemaking and planning, found in the leader cognition literature on solving complex problems (Marcy, 2015; Mumford, Todd, Higgs, & McIntosh, 2017), which then brings us back again to the literature on vanguard leadership and the ways in which Guy Debord was a strategic thinker (Shukaitis, 2014). All of these phenomena are important to integrate into a more holistic understanding of vanguard leadership.

Conclusion

This article aimed to undertake a comprehensive review and theoretical integration of relevant work related to the leadership of vanguard groups. In doing so, this article attempted to provide some definition towards the construct of socio-political vanguard leadership; namely, leaders of groups that are somewhat autonomous from established political parties or social movements, and that are deliberately not a direct part of the political process. Vanguard leaders work to influence ideas and shift public consciousness in order to create the socio-political conditions for actors and groups to better effect political change. In this respect, vanguards are distinct from both social movements leaders as well as status quo political leaders, particularly in the lack of goals to become a part of mainstream decision-making. The military applications of the term ‘vanguard’ as being a separate, forward front also speaks to this idea of a vanguard being apart from the mainstream; in a socio-political context, the vanguard is identified by the introduction of new beliefs and norms that directly challenge those of the wider society.

The review of the literature on (but not excluded to) social movement leaders, political leadership, and advocacy/artist collectives highlight some particularly interesting gaps. The extant literature pertaining to avant-gardes and/or leadership within fringe socio-political contexts is heavily grounded in critical theory and the study of social movements. These works have contributed greatly to our understanding of the context of socio-political change, as well as the role that leadership can play in bringing this about; more work, however, on the practice of vanguard leadership would be advantageous to deepening our understanding of how particular leadership tactics influence and shape ideas within smaller collectives as well as larger societies. More specifically, this article identified that the goal of vanguard leaders – to shift the dominant worldview of public consciousness in order to allow space for later groups to further political agendas – is necessarily hostile towards established elites while at the same time not directly vying for elite power. Attending to this goal thus invites strategies that are geared less towards collaboration and more towards agitation tactics. In addition, socio-political vanguard leaders attend to different specific goals at different levels of analysis: amongst others, the individual level requires leader cognitive skills related to creativity and social innovation; the group level requires the leadership skills to form, cohere, and guide a team; and the societal level requires the creation, implementation, and the hopeful adoption of a prescriptive mental model by the public through unconventional means.

Using historical examples of the Futurist art movement of the early 1900s and the Situationist International of the 1960s, this article analyzes the goals and strategies of the vanguard leaders within these movements to illustrate parallels to the present-day Alt-Right movement in the West. In doing so, some future directions for research are suggested. First, the focus on the individual level of cognitive abilities of vanguard leaders, in line with the area of social innovation that is radical but non-violent, and of leaders that seek to shape mainstream

worldviews but not takeover the existing reigns of political power. Second, a deeper examination of the strategies employed to achieve the central goal of mindshare, and the intersection of new technologies with vanguard ideas. Third, longer-term inspection of the effects of different vanguard leaders on existing socio-political beliefs and values, to trace the impact of vanguard ideas on mainstream culture. Taken together, this article proposes that these insights offer a potentially rich area of future work within leadership studies.

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Leadership succession in different types of organizations: What business and political successions may learn from each other

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ABSTRACT

We systematically review the recent impactful leadership succession literature in three types of organizations/contexts, namely publicly-traded, privately-owned (mostly family businesses), and political organizations. We compare and contrast these literatures, and argue that business and political leadership succession researchers and practitioners can learn from each other. The purpose of the review is fourfold. First, to take stock of the existing leadership succession research in these three related literatures – that examine the same essential phenomenon – but that have evolved separately. Previous reviews have focused mostly on CEO succession (not the broader phenomenon of leadership succession) mainly in publicly-traded firms; and to our knowledge no (recent) comprehensive literature reviews on the important topics of privately-owned and political organization leadership succession exist yet. Second, to develop an overarching integrative conceptual framework (ICF) that structures the overall leadership succession literature and shows the potential areas of integration and difference among the three literatures. Third, to develop three organizational frameworks – one for each organization type – that review what we know and what we should know about leadership succession in each type. Fourth, to critically compare the ICF, the three organizational frameworks, and the three literatures to better understand the similarities and differences among these literatures. By doing so and using a multidisciplinary approach we aim to contribute to the field in the following ways. Firstly, we seek to synthesize the field of leadership succession to identify important research questions that are ripe for study in the near future in the business and political science disciplines. Secondly, we strive to uncover what succession researchers and practitioners across these disciplines may learn from each other.

Introduction

Leadership succession is a potentially disruptive inevitable event/process that every organization faces (Giambatista, Rowe, & Riaz, 2005; Kesner & Sebora, 1994). Recently, organizations have been dealing with leadership successions more frequently (Charan, 2005), since top leaders' average tenure is shortening (Gardner Jr, 2009; Saporito & Winum, 2012). While planned successions can lead to relatively smoother transitions and may have minimal or even positive impact on post-succession performance, unplanned transitions can shake their organizations hard (Shen & Cannella, 2003; Vancil, 1987).

Various factors can influence an organization's leadership succession, which in turn, may result in different outcomes. Given the importance of the effects of leadership succession, CEO succession researchers have reviewed the literature almost decennially to

understand the phenomenon and the factors leading to positive and/or negative CEO succession outcomes in order to advance research and practice on CEO succession. The three reviews on CEO succession done by Kesner and Sebora (1994), Giambatista et al. (2005), and Berns and Klärner (2017) focused on the antecedents and consequences as well as the event and process of CEO succession, mainly in publicly-traded firms, without distinguishing between successions in different types of organizations. These reviews enriched the field by highlighting some of the gaps, and suggesting interesting directions for future CEO succession research, mainly in publicly-traded firms. Examining these reviews in chronological order, readers will notice that some suggested research in previous reviews has been acted upon in following years, a practice which informed the field considerably. While, we believe that CEO succession in publicly-traded organizations still has some untapped research questions and venues, our paper has a different and broader

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purpose.

Undoubtedly, leadership succession is an important event/process in the life of organizations, but not only publicly-traded organizations. Researchers have also studied leadership succession in privately-owned/family businesses and in political entities. Given that these researchers generally are from different fields/areas and with separate backgrounds and interests, these three literatures have evolved fairly separately. Research in these different literatures generally has been published in different journals/outlets, has used different methodologies, and has proposed different suggestions and calls for actions. We argue that leadership successions in these different types of organizations (i.e. CEOs in publicly-traded and privately-owned firms, and leaders in political entities) have some common as well as unique characteristics. To our knowledge, no study has attempted to build bridges among leadership successions in these three literatures. Our interest in reviewing leadership succession in these literatures stems from our conviction that doing so can provide business and political succession researchers with opportunities to learn from each other, especially in the wake of some recent critical and unusual political and business leadership successions (Dionne, 2017).

Fig. 1 represents the overarching Integrative Conceptual Framework (ICF) that we developed for leadership succession in different organization types getContexts. This ICF shows 1) the Leadership Succession Process' potential elements that are common/similar in the three organization types getContexts (in the big box in the middle of the ICF) and 2) the characteristics of the three organization types getContexts that can make aspects of this Leadership Succession Process different in each organization types/context (in the two boxes at the top of the ICF and the box at the bottom of the ICF). The Leadership Succession Process box not only summarizes the current state of research on leadership succession, it also includes variables that have not been studied yet and that we consider to make important venues for future research.

In the next sections of this paper we review the current state of leadership succession in each of the three organization types while

briefly comparing and contrasting them with each other. Then we provide suggestions for future research for each organization type as well as suggestions for what each type may learn from the other types. Finally, we conclude by further integrating the three literatures through additionally focusing on what business and political leadership successions may learn from this review and from each other and discussing the similarities and differences among these three literatures.

To uncover what business and political succession analysts may learn from each other, we systematically review and organize the recent impactful leadership succession literature around categories and sub-categories of research questions that have been studied in the literature (i.e. what we know) and structure these categories/subcategories under succession antecedents; succession event, characteristics, and theories; and, succession consequences. Moreover, we identify important questions that should be studied in the near future (i.e. what we should know) for each of the three organization types, namely, publicly-traded, privately-owned, and political organizations (see **Fig. 1** and **Tables 1, 2, and 3**).

We do this for the following purposes. First, to take stock of the recent impactful leadership succession research in these three related literatures that have evolved separately. This is important, especially because previous reviews focused on CEO succession mainly in publicly-traded firms and no (recent) comprehensive reviews on the important topics of privately-owned and political organization leadership succession exist. Second, to develop an ICF for leadership succession in different organization types getContexts that structures the three literatures around antecedents, event/characteristics, and consequences and shows the potential areas of integration and difference among the three literatures (see **Fig. 1**). Third, to develop three organizational frameworks – one for each organization type/context – organized around research questions (what we know) and future directions (what we should know) (see **Tables 1, 2, and 3**). Fourth, to critically compare the three literatures, organizational frameworks, and ICF to better understand the similarities and differences among these literatures.

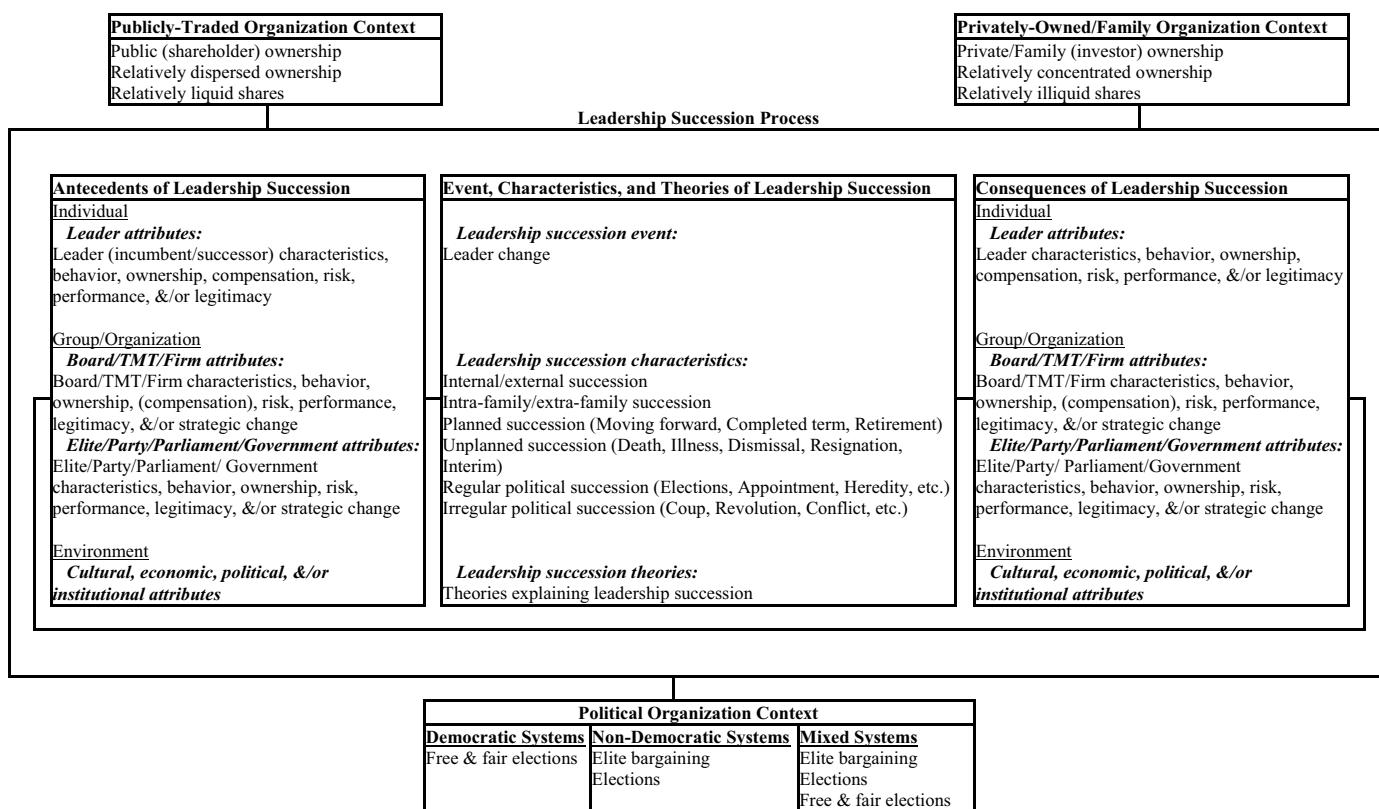


Fig. 1. Integrative conceptual framework (ICF) for leadership succession in different organization types getContexts.

Table 1

Themes of studied research questions and proposed future directions for leadership succession in publicly-traded organizations (PTOs).

Articles	First Order or Subcategory Themes of Research Questions	Second Order or Category Themes of Research Questions	Third Order or Overall Themes of Research Questions	Important Future Directions for PTOs	Important Future Directions for/from other Literatures
Magnusson and Boggs (2006); Zhu and Shen (2016); You and Du (2012); Fitzsimmons and Callan (2016); Wiersema et al. (2018); Campbell et al. (2011)	<i>Leader (Incumbent/Successor) Characteristics and Succession</i> Number of Articles = 6	<i>Individual Level Antecedents: Leader Attributes: Leader (Incumbent/Successor) Characteristics, Behavior, Ownership, Compensation, Risk, Performance, &/or Legitimacy</i>		Following a scandal, should we fire the CEO immediately? If yes, do we promote internally or hire externally, or appoint an interim CEO until we find the 'right' leader?	For other literatures: Following a scandal, should we fire the political leader immediately? If yes, do we promote the vice leader or look for an outsider, or appoint a neutral custodian until we find the 'right' leader?
Wowak et al. (2011); Wang et al. (2017); Inderst and Mueller (2010)	<i>Leader (Incumbent/Successor) Compensation and Succession</i> Number of Articles = 3			Does CEO power affect the relationship between poor performance and CEO dismissal in cultures other than China?	
Lehn and Zhao (2006); Arthaud-Day et al. (2006); Lee et al. (2012); Wiersema and Zhang (2011)	<i>Leader (Incumbent/Successor) Performance and Succession</i> Number of Articles = 4	<i>Antecedents of Leadership Succession</i> Number of Articles = 36		What role should the board play during the CEO transition period?	For other literatures: Should there be a transition period? Which body should be involved in ensuring a smooth transition?
Zhang (2008); Lau et al. (2009); Davidson et al. (2006); Tian et al. (2011); Jung (2014); Balsmeier et al. (2013); Halebian and Rajagopalan (2006)	<i>Board Characteristics and Succession</i> Number of Articles = 7	<i>Group/Organizational Level Antecedents: Board/TMT/Firm Attributes: Board/TMT/Firm Characteristics, Behavior, Ownership, (Compensation), Risk, Performance, Legitimacy, &/or Strategic Change</i> Number of Articles = 16		Should poor firm performance, be it financial, people, or planet lead to firing the CEO? And if so, when? (this question needs theoretical as well as empirical answers)	For other literatures: Should poor firm performance, be it financial, people, or planet lead to firing the leader? And if so, when?
Ertugrul and Krishnan (2011); Citrin and Ogden (2010)	<i>Board Compensation/Performance and Succession</i> Number of Articles = 2			Do different environmental attributes require different characteristics in a CEO?	For other literatures: Do different environmental attributes require different characteristics in a leader?
Conyon and He (2014); Hornstein (2013); Fiordelisi and Ricci (2014); Bushman et al. (2010); Berry et al. (2006); Mobbs and Raheja (2012); Zhang (2006)	<i>Firm Characteristics/Risk/Performance and Succession</i> Number of Articles = 7	<i>Environmental Level Antecedents: Cultural, Economic, Political, &/or Institutional Attributes</i> Number of Articles = 7			
Eisfeldt and Kuhnen (2013); Jenter and Kanaan (2015); Crossland and Chen (2013); Chen et al. (2012); Helwege et al. (2012); Marshall et al. (2014); Ozelge and Saunders (2012)	<i>Cultural and Institutional Attributes and Succession</i> Number of Articles = 7				
Zhang and Qu (2016); Pi and Lowe (2011); Mobbs (2013)	<i>Leader Change</i> Number of Articles = 3	<i>Leadership Succession Event</i> Number of Articles = 3	<i>Event, Characteristics, and Theories of Leadership Succession</i> Number of Articles = 15		For other literatures: What prevents the dismissal of poorly performing political leaders?
Tsoulouhas et al. (2007); Boyer and Ortiz-Molina (2008); Davidson et al. (2008); Connelly et al. (2016); Georgakakis and Ruigrok (2017); Karaevli and Zajac (2012)	<i>Internal/External Succession</i> Number of Articles = 6	<i>Leadership Succession Characteristics</i> Number of Articles = 12		What prevents the dismissal of poor performers?	For other literatures: What prevents the dismissal/replacement of poorly performing family members?
Ballinger and Marcel (2010); Liang et al. (2012); Mooney et al. (2017); Chen et al. (2015)	<i>Planned/Unplanned Succession</i> Number of Articles = 6				
Bornemann et al. (2015); Yermack (2006)	<i>Succession and Leader Behavior/Compensation</i> Number of Articles = 2	<i>Individual Level Consequences: Leader Attributes: Leader Characteristics, Behavior, Ownership, Compensation, Risk, Performance, &/or Legitimacy</i> Number of Articles = 2		Do fixed CEOship terms improve or worsen firm performance?	For other literatures: What is the optimal leadership term for the best interest of the country? From other literatures: Should organizations adopt a fixed term for their CEOs?
Dikolli et al. (2014)	<i>Succession and Board Behavior</i> Number of Articles = 1				
Cao et al. (2006);	<i>Succession and Firm Characteristics</i> Number of Articles = 1				
Clayton et al. (2005); Karaevli (2007); Schepker et al. (2017); Behn et al. (2005); Kato and Long (2006); Bilgili et al. (2017); Quigley et al. (2017); Hamori and Koyuncu (2015); Ting (2013); Giomulya and Boeker (2014); Adams and Mansi (2009); Chung and Luo (2013); Bernard et al. (2016)	<i>Succession and Firm Performance</i> Number of Articles = 14	<i>Group/Organization Level Attributes: Board/TMT/Firm Attributes: Board/TMT/Firm Characteristics, Behavior, Ownership, (Compensation), Risk, Performance, Legitimacy, &/or Strategic Change</i> Number of Articles = 22	<i>Consequences of Leadership Succession</i> Number of Articles = 24	What could be "people or planet" performance measures rather than profit/financial performance measures?	For other literatures: What could be "people or planet" performance measures for political organizations?
Lin and Liu (2012); Chiu et al. (2016); Karaevli and Zajac (2013); Nakauchi and Wiersema (2015); Elosge et al. (2018); Quigley and Hambrick (2012)	<i>Succession and Strategic Change</i> Number of Articles = 6			How can a CEO's mandate affect the link between CEO origin and strategic change?	For other literatures: Should a simple change in the political mindset of the new leader, from democratic to conservative (or vice versa), lead to a strategic change in the country's directions even if the country is doing well, or should such a change affect only certain areas but not others. Examples may include changing the managers of certain key positions in the government to be in line with the new leader's political views.

Table 2

Themes of studied research questions and proposed future directions for leadership succession in privately-owned/family organizations (POFOs).

Articles	First Order or Subcategory Themes of Research Questions	Second Order or Category Themes of Research Questions	Third Order or Overall Themes of Research Questions	Important Future Directions for POFOs	Important Future Directions for/from other Literatures
Salvato et al. (2012); Dalpiaz et al. (2014); DeNoble et al. (2007)	<i>Successor Characteristics and Succession</i> Number of Articles = 3	<i>Individual Level Antecedents: Leader Attributes: Leader (Incumbent/Successor) Characteristics, Behavior, Ownership, Compensation, Risk, Performance, &/or Legitimacy</i> Number of Articles = 5	Antecedents of Leadership Succession Number of Articles = 9	How do culture-, country-, and/or region-specific gender-related beliefs, norms, practices, etc. differently influence leadership succession processes and outcomes in family firms?	For other Literatures: How do culture-, country-, and/or region-specific gender-related beliefs, norms, practices, etc. differently influence leadership succession processes and outcomes in monarchies?
Vera and Dean (2005); Haberman and Danes (2007)	<i>Successors' Gender and Succession</i> Number of Articles = 2	<i>Group/Organizational Level Antecedents: Board/TMT/Firm Attributes: Board/TMT/Firm Characteristics, Behavior, Ownership, (Compensation), Risk, Performance, Legitimacy, &/or Strategic Change</i> Number of Articles = 4		How are the media influencing perceptions on gender and how is this influencing leadership succession processes and decisions in privately-owned/family firms?	For other literatures: How are the media influencing perceptions on gender and how is this influencing leadership succession processes and decisions in monarchies?
Hillier and McColgan (2009); André (2009); Tsai et al. (2009); González et al. (2015)	<i>Firm Performance and Succession</i> Number of Articles = 4	<i>Intra-Family/Extra-Family Succession</i> Number of Articles = 11	Leadership Succession Characteristics Number of Articles = 17	How do different national and regional characteristics (e.g. demographic, cultural, economic, regulatory, legal, institutional, etc.) influence leadership succession processes and decisions in family firms around the world?	For other literatures: How do different national, regional, and international characteristics (e.g. demographic, cultural, economic, regulatory, legal, institutional, etc.) influence political leadership succession processes and decisions around the world?
De Massis et al. (2016); Lambrecht (2005); Lam (2011); McMullen and Warnick (2015); De Massis et al. (2008); Salvato and Corbetta (2013); Royer et al. (2008); Jaskiewicz et al. (2016); Liu et al. (2015);	<i>Planned/Unplanned Succession (Succession Planning)</i> Number of Articles = 6	<i>Event, Characteristics, and Theories of Leadership Succession</i> Number of Articles = 21		How do different external firm characteristics (e.g. industry, etc.) impact leadership succession processes and decisions in privately-owned/family firms?	For other literatures: How do different external country characteristics (e.g. regional/global agreements, etc.) impact leadership succession processes and decisions in political organizations?
Motwani et al. (2006); Tatoglu et al. (2008); Gilding et al. (2015); Marshall et al. (2006); Eddleston et al. (2013); Gagné et al. (2011)	<i>Theories Explaining Family Business Leadership Succession</i> Number of Articles = 4	<i>Leadership Succession Theories</i> Number of Articles = 4			
Janjuha-Jivraj and Spence (2009); Blumentritt et al. (2012); Yan and Sorenson (2006); Jaskiewicz et al. (2015)	<i>Succession and Leader Characteristics</i> Number of Articles = 2	<i>Individual Level Consequences: Leader Attributes: Leader Characteristics, Behavior, Ownership, Compensation, Risk, Performance, &/or Legitimacy</i> Number of Articles = 2	Consequences of Leadership Succession Number of Articles = 19	Are family CEOs less likely than non-family CEOs to depart their positions following poor family firm performance? If so, what governance structures should be put in place in family firms to reduce favoritism?	For other literatures: Do autocrats have negative impact on their countries? If so, what factors can mitigate this impact?
Brun de Pontet et al. (2007); Cadieux (2007)	<i>Succession and Firm Characteristics/Risk</i> Number of Articles = 3	<i>Group/Organization Level Attributes: Board/TMT/Firm Attributes: Board/TMT/Firm Characteristics, Behavior, Ownership, (Compensation), Risk, Performance, Legitimacy, &/or Strategic Change</i> Number of Articles = 10		Given that family CEO successors negatively influence family firm performance, what factors can mitigate this relationship?	
Fan et al. (2012); Molly et al. (2010); Amore et al. (2011)	<i>Succession and Firm Characteristics/Longevity</i> Number of Articles = 10	<i>Successor Characteristics and Firm Performance</i> Number of Articles = 4			
Pérez-González (2006); Bennedsen et al. (2007); Cucculelli and Micucci (2008); Chittor and Das (2007); Divisich et al. (2009); Cabrera-Suarez (2005); Pan et al. (2018); Fahed-Sreih and Djoudourian (2006); Carney et al. (2014)					
Venter et al. (2005); Cater III et al. (2016); Sharma and Irving (2005); Sandeshmukh and Corbett (2011)					

Table 3

Themes of studied research questions and proposed future directions for leadership succession in political organizations (POs).

Articles	First Order or Subcategory Themes of Research Questions	Second Order or Category Themes of Research Questions	Third Order or Overall Themes of Research Questions	Important Future Directions for POs	Important Future Directions for/from other Literatures
Bennister et al. (2015)	<i>Leader Power and Succession</i> Number of Articles = 1	<i>Individual Level Antecedents: Leader Attributes</i> Number of Articles = 1	Democratic Systems Number of Articles = 19	How does a leader's political capital explain incumbent resiliency?	For other literatures: How does a leader's political capital explain incumbent resiliency?
O'Brien (2015); Greene and Haber (2016); Ennser-Jedenastik and Müller (2015); Malamud (2015); Horiuchi et al. (2015); Bolleyer and Bytzeck (2017)	<i>Democratic Elite Bargaining and Succession</i> Number of Articles = 6	<i>Group/Organizational Level Antecedents: Elite/Party/Parliament/Government Attributes</i> Number of Articles = 6		How do the perceptual expectations of party followers influence leader survival?	For other literatures: How do the perceptual expectations of the managerial elite with respect to a predecessor influence a successor's survival?
Kenig (2008); Kenig (2009); Cross and Blais (2012); Wauters (2014); Faucher (2015); Matthews (2016); Barnea and Rahat (2007); Treanor (2010); Baker and FitzPatrick (2010); Fleming (2010)	<i>Democratic Rules and Succession</i> Number of Articles = 10	<i>Environmental Level Antecedents: Cultural, Economic, Political, &/or Institutional Attributes</i> Number of Articles = 10		How is the "widening" and democratization of the electorate influencing the rules and process of political succession?	For other literatures: If leadership succession faces democratizing pressures, how does this influence the rules and process of succession?
Lehrer (2012); Somer-Topcu (2017)	<i>Succession and Electoral Consequences</i> Number of Articles = 2	<i>Group/Organizational Level Consequences: Elite/Party/Parliament/Government Attributes</i> Number of Articles = 2		What is the relationship between the kinds of people controlling leader selection and the party's responsiveness to voters?	From other literatures: What is the relationship between the kinds of people controlling executive selection and the firm's responsiveness to shareholders and stakeholders?
Magaloni (2008); Hale (2005); Hoffmann (2009); Brownlee (2007); Kokkonen and Sundell (2014); Donno (2013); Gabay (2014); Maltz (2007); Jones (2011); Blank (2008); Radnitz (2012); Herron (2011); Stacher (2008)	<i>Non-Democratic Elite Bargaining and Succession</i> Number of Articles = 18	<i>Group/Organizational Level Antecedents: Elite/Party/Parliament/Government Attributes</i> Number of Articles = 18	Non-Democratic Systems Number of Articles = 27	How do autocrats establish credible power-sharing commitments? How do authoritarian leaders achieve familial power transfer?	For other literatures: How are outgoing leaders best accommodated to transfer power peacefully?
Gandhi and Przeworski (2007); Frantz and Stein (2017); Zeng (2013); Cheeseman (2010); Nalepa and Powell (2016)	<i>Non-Democratic Institutions and Succession</i> Number of Articles = 5	<i>Environmental Level Antecedents: Cultural, Economic, Political, &/or Institutional Attributes</i> Number of Articles = 5		How do democratic institutions perpetuate (or undermine) autocracy? How influential are international bodies in policing political violence?	For other literatures: How do (democratic) institutions perpetuate (or undermine) leader succession? For other literatures: What sorts of international factors influence leader succession?
Goemans (2008); Escribá-Folch (2013); Albertus and Menaldo (2014); Tanaka (2016)	<i>Regular/Irregular Succession</i> Number of Articles = 4	<i>Event, Characteristics, and Theories of Leadership Succession</i> Number of Articles = 4		Why and when do certain dictators relinquish power while others do not? From other literatures: Which leaders (i.e., with which characteristics) more easily relinquish power?	For other literatures: Why and when do certain leaders relinquish power while others do not? From other literatures: Which leaders (i.e., with which characteristics) more easily relinquish power?
Jalalzai and Krook (2010)	<i>Women's Political Leadership Worldwide and Succession</i> Number of Articles = 1	<i>Individual Level Antecedents: Leader Attributes</i> Number of Articles = 1	Mixed Systems Number of Articles = 7	What factors explain the feminization of leadership? How does gender influence succession?	From other literatures: What factors explain the feminization of leadership? How does gender influence succession? Is there a generational aspect to the feminization of succession?
Marsteinredet and Berntzen (2008); Marsteinredet (2014); Bature (2010)	<i>Presidential Systems and Succession</i> Number of Articles = 3	<i>Group/Organizational Level Antecedents: Elite/Party/Parliament/Government Attributes</i> Number of Articles = 3		What is the current relationship between presidentialism and stable succession?	For other literatures: How does the formal structure of the firm's leadership influence stability in succession?
Konrad and Skaperdas (2007); Debs (2016)	<i>Incentive Structures, Rents, and Succession</i> Number of Articles = 2	<i>Environmental Level Antecedents: Cultural, Economic, Political, &/or Institutional Attributes</i> Number of Articles = 2		What sorts of incentives influence succession?	For other literatures: What sorts of incentives influence succession?
Konrad and Mui (2017)	<i>Succession and Incentive Structures and Rents</i> Number of Articles = 1	<i>Environmental Level Consequences: Cultural, Economic, Political, &/or Institutional Attributes</i> Number of Articles = 1		How do individual incentives and costs influence the succession process?	For other literatures: When is it rational for self-interested leaders to manage their own succession?

Our overarching aim is to contribute to the current state of the field in the following multidisciplinary (Antonakis, 2017a; Day, 2017) ways. By using a multidisciplinary approach, firstly, we seek to synthesize the field of leadership succession to identify critical research gaps and conceptual and empirical research questions that are ripe for study in the near future in the business and political science disciplines. Secondly, we strive to uncover what leadership succession researchers and practitioners across these disciplines may learn from each other.

Importance and scope of the study

This paper systematically reviews – as per the Tranfield, Denyer, and Smart (2003) guidelines – the state of the field of leadership succession in publicly-traded, privately-owned, and political entities; three literatures that are related but that have evolved fairly separately. Reviewing these literatures on leadership succession is important and necessary for the following reasons: 1) the number of studies on this phenomenon is growing because of the rise in leadership successions [CEO turnover rate of the world's 2500 largest companies in 2015 was 16.6%, the highest rate in the past 16 years (PwC, 2016)]; and 2) the not so effective practice of replacement of leaders (Charan, 2005). Moreover, this growing literature is addressing new research questions, examining new individual, group, and organizational/state/country level succession antecedents and consequences, and is analyzing succession using new theoretical lenses and research methods due to the expanding diversity of the backgrounds and perspectives of the researchers studying succession (see Fig. 1 and Tables 1, 2, and 3). Further, this body of succession literature is growing in complexity (Aguilera & Jackson, 2010).

We define leadership succession as the voluntary or involuntary replacement of the highest ranking person ('t Hart & Uhr, 2011; Connolly et al., 2016) in a publicly-traded, privately-owned, or political organization (it consists of two distinct actions, the departure of the outgoing leader and the selection/appointment of the incoming leader). A publicly-traded organization (PTO) is a firm that has issued securities through an initial public offering (IPO) and is traded on at least one stock exchange or over-the-counter market (i.e. is owned by public shareholders). Becoming a public firm allows the market to determine the value of the firm through daily trading (Investopedia, 2016a; Trostel & Nichols, 1982). A privately-owned/family organization (POFO) is a firm owned by private investors or family members. Thus, it does not need to meet the Securities and Exchange Commission's (SEC) strict filing requirements for public firms in the U.S. Private firms may issue stock and have shareholders, but their shares do not trade on public exchanges and are not issued through an IPO. In general, the shares of these firms are less liquid and their values are difficult to determine (Investopedia, 2016b; Trostel & Nichols, 1982). Most POFOs are family businesses, but some are owned by private equity firms. A political organization (PO) is an institution or entity that is virtually owned/funded by taxpayers/society, that influences, creates, enforces, and/or applies laws; mediates conflict; and/or influences/makes policies on the economy and social systems. Examples of political organizations include presidencies; federal and state governments, legislatures, and judiciaries; public bureaucracies, political parties, etc. (Rhodes, Binder, & Rockman, 2008). Thus, in this review, leadership succession refers to CEO/president succession in publicly-traded and privately-owned firms and to presidential, prime ministerial, and party leader succession, in political entities.

Kesner and Sebora (1994) and Giambatista et al. (2005) reviewed the CEO succession literature, mainly in publicly-traded organizations, up to 2005. Handler (1994) and Brockhaus (2004) reviewed the CEO succession literature, in family businesses (i.e. mainly in privately-owned organizations), up to 2004. To our knowledge, no comprehensive literature review on leadership succession in political entities exists yet. Thus, to review the breadth of the above three leadership succession literatures with enough depth, relevance, currency, and

conciseness such that we can fit our review within the current space limits, we followed Wowak, Gomez-Mejia, and Steinbach (2017) and comprehensively reviewed the most recent research (i.e. 2005 - present) in these three literatures published in impactful journals, defined as business and political science journals ranked in the top quartile, Q1, in Scopus' journal rankings.

To find articles relevant to our review of the three literatures we first used various combinations of keywords related to leader(ship) succession and their synonyms, including CEO, president(ial), prime minister(ial), party, executive, family business, small business, entrepreneur, founder, new leader/CEO, etc. succession, transition, turnover, replacement, selection, change, transfer, and so on. Then we searched for relevant backward and forward citations of the articles we found in our keyword searches. Following Berns and Klärner (2017: 85) we included articles on leader(ship) succession and excluded articles marginally related to leader(ship) succession. For example, articles that were about leader(ship) in general but not about succession in particular, about phenomena marginally related to leader(ship) succession but not about the leader(ship) succession phenomenon itself as the main phenomenon of interest, about executive (i.e. top management team) succession but not about the top leader's succession, and about aspects of political leadership elections that are not about political leader(ship) succession were excluded. Moreover, since the beginning, in our review of leadership succession in PTOs we included only articles that used samples of PTOs; in our review of leadership succession in POFOs we included only articles that used samples of POFOs. To avoid article duplication and keep the distinction between PTOs and POFOs clear, articles that explicitly used hybrid samples of PTOs and POFOs were neither included in our review of PTOs nor included in our review of POFOs. These articles are included in Appendix A Table A.1. Furthermore, in our review of leadership succession in POs we included only articles that were about POs (e.g. presidencies; federal and state governments, legislatures, and judiciaries; political parties, etc.). However, we did not include articles that were about not-for-profit organizations (e.g. religious, educational, charitable, scientific, and literary organizations; civic and social welfare organizations, and local associations; credit unions; etc.).

Initially, we comprehensively reviewed/summarized about 150 articles on leadership succession in PTOs, about 110 in POFOs, and about 100 in POs. That is, we summarized about 360 articles published in Scopus-indexed journals and coded them based on organization type, Scopus journal quartile ranking (i.e. Q1, Q2, Q3, and Q4), papers' methodology (empirical quantitative, empirical qualitative, theoretical/conceptual, literature review, etc.), data type (when applicable), statistical analysis type (when applicable), among others. When we applied the above inclusion/exclusion criteria, the number of articles included in this review became 177 articles in total (75 on PTOs, 49 on POFOs, and 53 on POs). We believe this is a more meritorious way to review the literature, as it includes better quality, more rigorous, and thus more impactful/useful studies (Antonakis, 2017b).

To organize our review of the three literatures we borrowed from qualitative research methods, namely the multi-order approach by Gioia, Corley, and Hamilton (2013). First order or subcategory themes represent the closest ideas to the articles, second order or category themes represent the grouping of the first order themes into broader topics, and third order or overall themes represent the grouping of the second order themes into bigger umbrella topics (see Tables 1, 2, and 3). In our review of the three literatures and their organizational frameworks (Tables 1, 2, and 3) themes of research questions can be ranked from most important/researched to least important/researched, by mostly relying on the number of articles published on this subject. While some articles may cross the boundaries between first order, second order, and sometimes even third order themes, we chose to cite/list articles only under one category, to avoid double counting/double citing articles. We cited/listed each article under the theme/subtheme that it was most relevant to and contributed to the most.

Literature review: leadership succession in publicly-traded organizations

"What a firm becomes can be significantly influenced by how and to whom this [CEO's] power and authority are passed ... This makes CEO succession a defining event for virtually every organization" (Kesner & Sebora, 1994: 352; Brackets are added).

Since Kesner and Sebora (1994) recognition of the impact of CEO succession on the fate of organizations, research on CEO succession has not slowed down. Research after 2005 has emphasized the antecedents, consequences, and the CEO succession event/characteristics, albeit unequally, with more emphasis on antecedents, followed by consequences, and much less on the event and its characteristics.

Antecedents of leadership succession

Leader attributes

Leader (incumbent/successor) characteristics and succession. Since most researchers studying CEO succession believe leaders matter, it is not surprising to find many studies examining the relation between CEOs' characteristics and CEOs' promotion or dismissal. Some of the characteristics that lead to executives' promotion to, or entrenchment in, the CEO position include executives' international experience (Magnusson & Boggs, 2006), experience with more or less diverse boards prior to appointment (Zhu & Shen, 2016), political connectedness especially in non-state owned institutions (You & Du, 2012), social capital gained across different business cycles/contexts (Fitzsimmons & Callan, 2016), and executives' overlapping experience/education with incumbent CEOs (Wiersema et al., 2018). On the other hand, CEOs with high or low levels of optimism are more likely to be forced out of their position than their counterparts with moderate optimism levels (Campbell et al., 2011).

Leader (incumbent/successor) compensation and succession. Since the 1990s, CEO compensation attracted attention from researchers and practitioners, especially in the absence of a significant link between executive compensation and firm performance (Henderson & Fredrickson, 1996). CEO succession researchers have also studied the impact of CEO compensation and its structure on CEO dismissal. CEO overpayment is not a predictor of CEO dismissal, especially that boards avoid dismissing CEOs, unless CEOs' overpayment is accompanied by serious underperformance (Wowak et al., 2011). Organizations with high levels of firm-specific knowledge usually use restricted stocks in CEO compensation to discourage the departure of CEOs with such knowledge and encourage them to stay and make long-term investments (Wang et al., 2017). Building on agency theory, Inderst and Mueller (2010) theorize that linking CEOs' compensation to firm performance plays a major role in incentivizing bad CEOs to leave without severance agreements and in retaining good performing CEOs. While CEO compensation got much attention in PTOs, it got little attention in POFOs and POs.

Leader (incumbent/successor) performance and succession. Another leader-related attribute that is studied in PTOs more than in the other two types of organizations is leader performance. CEOs who are bad bidders in cases of acquisitions (Lehn & Zhao, 2006), who file for financial restatements (Arthaud-Day et al., 2006), or who issue inaccurate forecasts (Lee et al., 2012) are negatively evaluated by external analysts (Wiersema & Zhang, 2011) and incur a higher likelihood of being dismissed from their CEO position.

Board attributes

Board characteristics and succession. Boards of directors are major players in the governance of PTOs. Boards guard the interests of shareholders and are therefore the body responsible for monitoring the performance of CEOs. More recently, they are becoming more active

in the CEO succession process. While, there is still much more to understand about board members' roles in CEO succession (Bernd & Klarner, 2017), their roles and incentive structures are even less studied in POFOs and POs. In PTOs, board members who do not actively seek enough information about external CEO candidates may suffer from information asymmetry, increasing the likelihood of CEO dismissal within a shorter period after appointment (Zhang, 2008). Larger boards, are more likely to dismiss a CEO based on his/her poor performance (Lau et al., 2009). The boards are attracted to candidates who are close in age to the board's average age; however, this attraction disappears if the candidate has a prior poor performance record (Davidson et al., 2006). Board members' human and social capital have a positive impact on firm performance following a CEO succession (Tian et al., 2011). The more external managers serve on a supervisory board, the higher the likelihood of choosing an external CEO (Jung, 2014); however, the higher the external experience of the supervisory board members the higher the likelihood of choosing an internal CEO (Balsmeier et al., 2013). In addition to the board composition, Halebian and Rajagopalan (2006) argue that the board's perception and attributions of the CEO's performance and efficacy affect their decision to dismiss the CEO.

Board compensation/performance and succession. In addition to boards' active roles in monitoring sitting CEOs, the structure of their incentives, that is increasing the equity-based share in boards' incentives, increases boards' proactiveness in dismissing potentially poor performing CEOs (Ertugrul & Krishnan, 2011). Citrin and Ogden (2010) find that board members should not be excluded when looking for a new CEO, especially given the combination of their inside knowledge of the organization and their outside perspective on operations.

Firm attributes

Firm characteristics/risk/performance and succession. While leaders' and boards' characteristics affect decisions related to CEO retention or dismissal, the idiosyncratic characteristics of the firm or the context of CEO succession also affect these decisions. Firms, namely in the Chinese context, rely on accounting performance measures rather than market or stock prices to decide on the performance of the firm, and on whether to retain or dismiss the CEO (Conyon & He, 2014). Some firms are more tempted to force CEOs out than others, including firms with agency and information asymmetry problems (Hornstein, 2013), with control-oriented cultures (Fiordelisi & Ricci, 2014), and with high idiosyncratic or firm-specific risks (Bushman et al., 2010). Other companies experience less forced CEO turnover, including companies that are diversified (Berry et al., 2006), and companies which value firm-specific human capital such as service industries (Mobbs & Raheja, 2012). The organization chart of a firm plays a role in CEO dismissal under low performance conditions. The presence of a separate COO or president position increases the chances of CEO dismissal when the firm is performing poorly (Zhang, 2006). Hence the presence of a fall back personality, may increase the chances of dismissing the leader of a poorly performing institution.

Environmental level antecedents: cultural, economic, political, &/or institutional attributes

Cultural and institutional attributes and succession. Some factors outside the locus of control of the organization affect CEO succession and the performance of the organization. Such factors include 1) industry and market conditions (Eisfeldt & Kuhnen, 2013; Jenter & Kanaan, 2015) and 2) country-level characteristics such as the degree of managerial discretion and development of CEO labor markets (Crossland & Chen, 2013), the structure of institutional shareholders (Chen, Li, Su, & Yao, 2012), or shifts in the dominant institutional logic such as the rise in institutional ownership, in board involvement, or shareholder activism (Helwege et al., 2012). Banks also play monitoring roles and force poorly performing companies to undertake CEO turnover (Marshall

et al., 2014; Ozelge & Saunders, 2012).

Event, characteristics, and theories of leadership succession

Studying the antecedents and consequences of CEO succession gets more attention than studying the leadership succession event/process and its characteristics.

Leadership succession event

Leader change. Though, it has been established in the literature that leader change negatively affects firm performance, this negative relationship is more prevalent when the change in leader is accompanied by a change in leader gender be it female to male or vice versa (Zhang & Qu, 2016). Changing the leader in certain firms is forced, however, leaders who are politically connected and have structural and tenure power have a higher ability to avoid forced replacement (Pi & Lowe, 2011), despite poor performance. Nevertheless, the presence of inside directors with externally appreciated talents, may force the current CEO out of his/her position. The main reason being these directors are able to serve immediately as insider CEO replacements or else the company risks losing them to competitors due to their needed talents (Mobbs, 2013). It is intriguing that this topic has been barely studied in POFOS and POs.

Leadership succession characteristics

Internal/external succession. The difference between internal and/or external successors has been extensively studied in leader succession in publicly-traded organizations. For example, what affects the board's decision to select an insider versus an outsider? Tsoulouhas et al. (2007) argue that boards should select insiders versus outsiders based on superior capabilities. Insiders are preferred to outsiders only if they have equal or better skills than outsiders, otherwise outsiders are preferred. However, Boyer and Ortiz-Molina (2008) show empirically that boards may make their decisions based on stock ownership. Executives with more stock ownership are more likely to be promoted to the CEO position; however, if inside executives do not own enough stocks, the board tends to hire an outsider CEO. When incoming CEOs have a greater bargaining power they are more likely to have duality (i.e. appointed CEO and board chair simultaneously), especially when outgoing CEOs are fired, or were externally hired, or insiders promoted from the COO or president positions (Davidson et al., 2008). Investors' perceptions of inside successors and outside successors depends on the reason for CEO succession. Following an integrity or competence failure, investors' have a better perception of the firm if the successor is an outsider (Connelly et al., 2016). Outside successors perform well when they resemble the incumbent CEO socio-demographically and have prior successful experience (Georgakakis & Ruigrok, 2017), or when the firm has been performing poorly under the previous CEO (Karaevli & Zajac, 2012).

Planned/unplanned succession. The use of interim CEOs has gained traction in practice (Ballinger & Marcel, 2010) and in CEO succession research is an interesting event especially in the case of unplanned exit of incumbents. Liang et al. (2012) propose a theoretical framework arguing about who is more likely to be an interim CEO and under which conditions. They argue interim CEOs who perform well in the transition period enjoy longer interim tenure and are more likely to get promoted to CEO. Using an interim CEO hurts firm performance unless the interim CEO serves simultaneously as the chairperson (Ballinger & Marcel, 2010), and boards usually choose to appoint interim leaders when the sitting CEO got fired and there is no known successor (Mooney et al., 2017). Interim CEOs are more likely to use earnings management (i.e. present overly positive financial reports) to boost firm performance especially in the absence of effective governance mechanisms (Chen et al., 2015).

Consequences of leadership succession

Leader attributes

Succession and leader behavior/compensation. Leaders' attributes have been studied more as antecedents rather than as consequences of succession. Though we believe that such an event can have an impact on the leader and that this impact might affect the way the leader conducts himself/herself during CEO tenure. CEOs, more so outside CEOs, increase discretionary spending during their first year of tenure even if the firm's risk exposure is high (Bornemann et al., 2015). Boards need to be attentive to the severance agreement offered to CEOs stepping down voluntarily as markets react negatively when these CEOs receive high payments (Yermack, 2006).

Board attributes

Succession and board behavior. Similar to leaders' attributes, boards' attributes have also been more studied pre rather than post succession. Boards increase their monitoring activities of the newly appointed CEO the first year and then their monitoring intensity decreases, hence sometimes justifying the weak link between poor performance and CEO turnover (Dikolli et al., 2014).

Firm attributes

Succession and firm characteristics. Unlike leaders' and boards' attributes, the impact of CEO succession on firm attributes, namely performance, has garnered a significant amount of research. Cao et al. (2006) argue CEO turnover negatively affects exploration and exploitation capabilities of the firm, unless the successor is at least as embedded as the predecessor in the firm's intrafirm and interfirm social networks, making the successor's choice an important task to minimize the effect of CEO turnover on firm capabilities.

Succession and firm performance. Firm performance captured the lion's share of CEO succession, it has served as the dependent variable in multiple studies. Earlier than 2005, the impact of the origin of the successor, insider versus outsider, on post succession firm performance has been extensively studied (Giambatista et al., 2005). CEO succession negatively impacts performance and increases the volatility of a firm's stock price (Clayton et al., 2005). Karaevli (2007) finds that the impact of CEO origin on firm performance is moderated by environmental munificence, prior firm performance, and changes in the top management team members. In their meta-analysis, Schepker et al. (2017) find that 1) CEO succession negatively impacts short-term firm performance but has no significant direct impact on long-term performance, 2) CEO origin plays a role in mediating the relationship between CEO succession and long-term performance, and 3) Inside CEOs do not engage in drastic strategic change but they improve long-term firm performance.

Having a succession plan in place reduces the negative impact of CEO succession on firm performance (Behn et al., 2005). Performance of firms with a majority controlling shareholder improves significantly after the replacement of the CEO (Kato & Long, 2006). Since the majority shareholder is actively involved in monitoring the performance of the CEO to save its own interests in the firm. Also, a firm's performance is contingent on the sensemaking and sensegiving cues released to the public post CEO replacement (Bilgili et al., 2017; Quigley et al., 2017), hence firm narratives play a major role in post succession performance.

Hiring previous CEOs is negatively linked to post succession firm performance (Hamori & Koyuncu, 2015); so is hiring successors with different power levels than the predecessor (Ting, 2013). However, prior experience as CEO with turnaround capabilities and the degree of fit of the successor to the succession's contextual conditions at hand positively affect post succession firm performance (Chen & Hambrick, 2012; Gomulya & Boeker, 2014). CEO succession affects different stakeholders differently. For example, generally bondholders' value decreases while stockholders' value increases post CEO succession (Adams

& Mansi, 2009). Therefore when looking at the impact of CEO succession on firm performance one should pay attention to different stakeholders rather than all stakeholders together. Also governing bodies need to pay attention to the characteristics of the successor, because insiders and outsiders access different kinds of resources (Chung & Luo, 2013). Recently, researchers have been investigating the impact of CEO succession not only on financial and market performance but also on corporate sustainability performance. Bernard et al. (2016) use upper echelon and agency theories to show that CEO turnover has a positive impact on a firm's corporate social performance. This positive impact is higher when the CEO is recruited from outside the firm.

Succession and strategic change. The ability of successors to induce strategic change has also drawn the attention of strategy and organization scholars. Some researchers believe that the ability of inside successors to induce strategic change after they become CEOs is usually limited because they are trained by previous CEOs (Bigley & Wiersema, 2002), while others show that outsiders are more likely to induce strategic change including the degree of firm internationalization (Lin & Liu, 2012). Thus, the origin of the CEO affects the strategic change undertaken post succession. Inside CEOs usually are more interested in achieving a greater scale of divestiture whereas outside CEOs are interested in increasing the scope of change through divestiture (Chiu et al., 2016). Karaevli and Zajac (2013) hypothesize the nature of the succession, the predecessor's tenure, and prior firm performance moderates the impact of outside CEOs on strategic change. These authors show that if succession is not forced or pre-succession firm performance increases, the outside origin of the new CEO is positively associated with post-succession strategic change; however, the moderating effect of the predecessor's tenure is not significant. Despite this debate, in a recent study, Eloge et al. (2018) do not find support to most of their hypotheses regarding the impact of insider or outsider origin of the CEO and its impact on strategic change measured through the firm's degree of internationalization.

Literature review: leadership succession in privately-owned (mostly family) businesses

"Family firms combine all the tensions of family life with all the strains of business life, and at no moment do both sorts of stress combine so forcefully as at that of generational change" (The Economist, 2004: 69).

Our literature review of leadership succession in privately-owned/family organizations revealed that most POFOs were family firms and almost all research on leadership succession in POFOs concerned family businesses. Thus, we will use the terms "POFOs" and "family businesses/firms" interchangeably hereafter.

Although we found more recent impactful studies on leadership succession in PTOs than POFOs (75 studies versus 49 studies respectively), leadership succession in POFOs may be more crucial to the survival and continuity of these organizations than to their publicly-traded counterparts. We argue this since fewer than 30% of family businesses are passed on to the second generation whereas only 10% make it to the third generation (Lansberg, 1999). Thus, in this section we review the literature on the essential topic of leadership succession in privately-owned/family businesses (i.e., what we know). To review this literature, we organize it into three overall themes and their respective category and subcategory themes that emerged during our review (as presented in the columns of Table 2).

Antecedents of leadership succession

Leader attributes

Successor characteristics and succession. Salvato et al. (2012) found that the selection of CEOs and their career patterns in family firms were driven more by the managerial skills they developed over their careers than by family-related issues, suggesting managerial proficiency

overcame nepotism in family firm CEO selections. Dalpiaz et al. (2014) developed a framework for understanding family business succession narratives and presented a typology of some of the narrative strategies (constructing a sense of family, family eulogizing, and highlighting non-family endorsement) that successors may use to legitimize their successions. DeNoble et al. (2007) pinpointed key social capital [e.g. family relationships with 1) incumbent CEO, 2) family members involved in the family owned business (FOB), and 3) family members not involved in the FOB; external and internal business relationships] and human capital [e.g. tacit firm-specific knowledge, industry knowledge, and general business knowledge] dimensions that could be utilized to develop a *family business self-efficacy scale* that could be used to identify and/or develop potential successful family successors.

Successors' gender and succession. Gender and succession has been limitedly studied in all three literatures. Given that in family firms, passing the baton to women family members is becoming more common, this topic has been somewhat more studied in POFOs than PTOs and POs. Vera and Dean (2005) found daughter successors in family firms faced challenges such as employee rivalry, work-life balance, and greater uncertainty about whether they would one day be the successor. They also found daughters experienced more difficulties succeeding their mothers than succeeding their fathers. Haberman and Danes (2007) found women in father-son firms suffered from feelings of exclusion and instances of higher disagreement among family members, which created less shared meaning, and lower levels of integration among family members. Women in father-daughter firms enjoyed feelings of inclusion, resulting in lower disagreement that produced higher levels of shared meaning, collaboration, and integration among family members.

Firm attributes

Firm performance and succession. Although organizational performance and succession has been well studied in both PTOs and POFOs, it has been limitedly studied in POs. Hillier and McColgan (2009) found that family CEOs were less likely than non-family CEOs to depart their positions following poor performance, due to weak internal governance systems in family firms. However, André (2009) criticized Hillier and McColgan's (2009) work and suggested it had a number of issues – related to performance measurement, sample selection, firm size and age, industry, etc. – that required further examination. Tsai et al. (2009) found a negative relationship between diversification level and CEO turnover in family firms, which they attributed to family CEOs entrenching themselves in their family firms.

Event, characteristics, and theories of leadership succession

Leadership succession characteristics

Intra-family succession (IFS) and extra-family succession (EFS). This topic has been extensively studied in POFOs. Internal versus external successions have also been fairly well studied in PTOs. However, similar topics (e.g. presidential, prime ministerial, etc. successions from within the same party versus from other parties) have not been studied in POs. Almost all articles in this category discussed either intra-family succession (IFS) alone or IFS versus extra-family succession (EFS). For instance, among the studies that discussed IFS, De Massis et al. (2016) showed that incumbents' attitudes towards IFSs are influenced by both situational (number of children and number of family shareholders) and individual (emotional attachment to the business) antecedents as well as by their interactions. Moreover, Lambrecht (2005) showed that IFS is a lifelong, continuous process, in which the family must cultivate the soft elements of the succession process (i.e., entrepreneurship, freedom, values, outside experience, upbringing, education, etc.). Further, a family business can develop into a family dynasty only when it embraces sound governance as a

fundamental principle (i.e., the individual family member belongs to the family, which belongs to the business). In addition, Lam (2011) highlighted the inconsistencies between the expressed attitudes, perceptions, plans, and actual behaviors of family firm members during the succession process and attributed these inconsistencies to the multi-entity roles family firm members simultaneously play during this interactive, dynamic social process. Furthermore, McMullen and Warnick (2015) theoretically argued that the more a parent-founder promotes affective commitment to the family business in a child-successor, by supporting his/her psychological needs for competence, autonomy, and relatedness within the family business, the greater the likelihood the child-successor will continue to engage in family business activities. Conversely, De Massis et al. (2008) analyzed the literature on family business succession and presented a long list of individual, relational, financial, contextual, and process factors that prevent IFS from occurring. Salvato and Corbetta (2013) analyzed the detailed descriptions of four advisor-directed leadership development processes in generational family businesses. They found that, by taking on a transitional leadership role shared with the incumbent and the successor, advisors can play a key role in facilitating the construction of successors' leadership.

Among the studies that discussed IFS versus EFS, Royer et al. (2008) found that specific (tacit) knowledge characteristics (e.g., relevant experiential family business-specific knowledge and relevant general and technical industry-specific knowledge) combined with a favorable transaction atmosphere, made IFS preferable over EFS. Furthermore, Jaskiewicz et al. (2016) identified four approaches (interwoven, selective, commercial, and detached) of managing potentially conflicting family and commercial logics that are related to four succession processes (combinations of family culture, leadership style, family continuity, and family unity) and that lead to IFS or EFS. In addition, Liu et al. (2015) found that even when a leader can overcome individual decision biases, a sampling bias resulting from families' strong ties can still allow a leader to wrongly conclude that IFS is better than EFS when the opposite is true (a form of nepotism).

Planned/unplanned succession (succession planning). This subcategory included several articles that discussed CEO succession planning. Motwani et al. (2006) found that 1) firms with less than US\$1 m in revenues placed a higher priority on selecting a successor with strong sales/marketing skills, presumably to achieve business growth and 2) it was important for all SMEs to develop a formal succession plan, communicate their successor's identity, and provide training/mentoring to the incumbent CEO. Tatoglu et al. (2008) found predecessors' perceptions about the extent of succession planning was related to their desire to relinquish power. Gilding et al. (2015), suggested that the family firm succession planning literature assumes incumbents have two main motives: family firm continuity and family harmony. By cross-tabulating these motives they produced a typology of four distinct combinations of motives for succession planning. They then argued these combinations of motives suggest four succession planning outcomes: institutionalization, implosion, imposition, and individualization.

Marshall et al. (2006) found that 1) older owner age was, paradoxically, directly related to formal succession plans and indirectly related to behavioral practices that interfere with succession planning and 2) both autocratic and relational leadership are positively associated with the importance of succession planning. Eddleston et al. (2013) found that the extent to which strategic planning and succession planning are related to family firm growth depends on the generation managing the firm. Both forms of planning positively affect first-generation, but not second-generation, firms' growth; succession planning and strategic planning respectively positively and negatively affect third-and-beyond generation firms' growth. Gagné et al. (2011) studied the effects of the goal adjustment capacities (goal disengagement and goal reengagement) of family business leaders nearing retirement age

on their retirement planning. They found that leaders with high goal reengagement capacities who trusted their successor's abilities set an earlier retirement date than others and that leaders with poor goal disengagement capacities who did not trust their successor were unable to improve their retirement expectations over time.

Leadership succession theories

Theories explaining family business leadership succession. Theory papers attempting to broadly explain the leadership succession phenomenon in general were found for POFOS but not for PTOs or POs. This category included mostly theory papers attempting to explain family firm succession or transgenerational entrepreneurship. Janjuha-Jivraj and Spence (2009) proposed a new development of reciprocity theory called Bounded Intergenerational Reciprocity and used it as a framework to explain the dynamics of intergenerational family firm succession. Blumentritt et al. (2012) introduced game theory as a model for analyzing family firm succession. They defined game theory as a set of rational but interdependent choices made by individuals about leadership. Yan and Sorenson (2006) conceptually examined Confucian values and their effect on family firm succession. Jaskiewicz et al. (2015) built a new theory, based on what they called Entrepreneurial Legacy, to explain how exceptional firms achieve transgenerational entrepreneurship.

Consequences of leadership succession

Leader attributes

Succession and leader characteristics. Brun de Pontet et al. (2007) found that although control stayed largely with incumbents in family firms approaching succession, indicators of succession readiness were more related to successors' levels of control. Cadieux (2007) presented a typology of predecessor roles during and after instatement of the successor and found that predecessors played teaching, protector, introducer, mobilizer, intermediary, and confidante roles during this period.

Firm attributes

Succession and firm characteristics/risk. Fan et al. (2012) found that privately-owned firms move from an insider- to a more outsider-based accounting system around a succession, due to predecessors' personalized assets (e.g. social/political networks), that facilitated relationship contracting, but that are nontransferable to successors. Additionally, Molly et al. (2010) found that first generation family CEO successions negatively impacted family firms' debt rates and growth rates but did not impact their profitability; however, later generation family CEO successions positively impacted family firms' debt rates but did not impact their growth rates or profitability. Amore et al. (2011) found that the appointment of non-family professional CEOs significantly increased the use of debt.

Succession and firm performance/longevity. Succession and organizational performance has been extensively studied in PTOs and POFOS, however it has been barely studied, if at all, in POs. This category in the research on POFOS included several articles discussing the relation between succession and different measures of firm performance. Pérez-González (2006), Bennedsen et al. (2007), and Cucculelli and Micucci (2008) found that family CEO successions, as compared to non-family professional CEO successions, had a negative impact on family firm performance. Chittoor and Das (2007) found that non-family CEO successions (commonly referred to as professionalization of management), compared to family CEO successions, had a positive impact on family firm performance.

Diwisch et al. (2009) did not find a relation between planned (future) successions [versus no planned (future) successions] and family firm growth, but found a positive relation between (past) successions and family firm growth. Cabrera-Suarez (2005) found that the quality

of interpersonal relationships, successors' expectations, and the role of the predecessor differentiated between more and less successful succession processes. Pan et al. (2018) found that family firms used more corporate philanthropy in connection to family (as compared to non-family) CEO successions, especially when the succession was a first generation CEO succession, suggesting it reduces the magnitude of poor performance after family CEO successions.

Two articles studied the determinants of family firm longevity. The first found older firms 1) used participatory decision-making, 2) held family meetings, and 3) had formal redemption and liquidity plans (Fahed-Sreih & Djoundourian, 2006). The second analyzed and discussed in some detail the differential effects of inheritance law provisions on family firm succession and longevity in Germany, France, Hong Kong, and the United States (Carney et al., 2014).

Successor characteristics and firm performance. In this category, Venter et al. (2005) found that the willingness of the successor to take over, and the relationship between the owner-manager and successor positively influenced both the satisfaction with the succession process and the continued profitability of the family firm. They also found that the preparation level of the successor positively impacted only the continued profitability of the family firm. Cater III et al. (2016) found the dynamics of successor teams may lead, either to a positive outcome/track resulting in team commitment and thus the continuity of the family firm, or to a negative outcome/track leading to the dissolution of the team and potentially the family firm. Sharma and Irving (2005) theoretically proposed four bases of successor commitment to family firms – affective, normative, calculative, and imperative – and argued that these different bases of commitment lead to varying levels of discretionary behaviors and thus of family firm performance. Sardeshmukh and Corbett (2011) found that successors who balance and combine their family firm-specific human capital, built through experience within the family firm, with general human capital, built through education and work experience outside the family firm, better perceive entrepreneurial opportunities.

Literature review: leadership succession in political organizations

"The king is dead, long live the king." (Anonymous)

In the field of political science, much attention is paid to how incumbent politicians hold on to power and, when necessary, how they are replaced. This interest certainly is merited, for as Bueno de Mesquita and Smith (2017: 708) note, "Political succession, or rather its avoidance, is at the heart of the decisions leaders make." To focus this inquiry we use Bynander and t Hart's (2006) approach. Bynander and t Hart (2006) view leader succession in politics as change in the occupation of senior positions within political parties in or out of government, the most conspicuous and consequential of which are those of heads of government and party leaders. Because change in senior political positions often accompanies (or necessitates) a change in the entire personnel exercising the powers of government owing to predictable political events such as elections (or unpredictable events like revolutions), there is a slippery definitional "slope" with which analysts must contend. Are all democratic elections really about succession? In one sense, they are, as every vote carries with it the chance to reaffirm the existing leader, or choose a new one. Yet democratic elections accomplish several discrete functions, such as determining public opinion on policy issues, recruiting new representatives, mobilizing followers, collecting financial resources, and so on. In analyzing such complexity, scholars focus on a variety of salient factors and questions, and so a relatively large literature on elections is published annually. For our purposes, only studies of elections as they pertain directly to succession – defined as change in the head of government or party leader office – are salient to this study.

Normally, democratic and non-democratic systems are distinguished when analyzing political phenomena across nation states,

owing to democracy's large effect on key processes. There are several different approaches to discern the level of democracy. A widely used and reliable method to determine a system's democratic status is to consult Freedom House's "Country Scores" ranking (Freedom House, 2018), which distinguishes free countries from those that are partly free and not free. We use this method here to refine our study of succession in the political sphere.

While this analysis compares the business and political science literatures on leadership succession, it's worth noting the two spheres are distinct in several respects. Modern democratic voting processes have few obvious analogs in the business world. For example, among publicly-traded firms it is difficult to locate organizations where all the employees regularly cast an equal vote to decide upon a new CEO (or retain the existing leader) as citizens do in elections.

Our search for recent impactful journal articles on leadership succession returned 77 results published in political science. The initial data collection was reviewed carefully, and some articles whose content did not reflect our inquiry were removed. A total of 53 articles met the criteria for analysis. These articles were allocated among three categories that reflected whether each concerned a system that was fully democratic (19 articles), not fully democratic (27 articles), or that referenced both types (which is termed "mixed systems") (seven articles). To refine our understanding of each study's main goal, we induced sub-categories based on each article's core research question(s). The main categories and sub-categories help to organize our inquiry. Their specific contents are discussed in more detail below, and are summarized in Table 3.

Democratic systems

Individual level antecedents: leader attributes

Leader power and succession. One of the three thematic categories comprises studies of democratic systems. Of the 53 research papers under scrutiny here, nineteen of these are about leadership succession within democratic systems. Within this theme, a first sub-category of analysis concerns leader power and succession. The study of power lies at the heart of political science, so it is a little surprising that only one of the nineteen democratic succession articles directly focuses on this subject. Bennister et al. (2015) conceived of leaders' political authority as a kind of capital. They present a Leadership Capital Index (LCI) that can be used to track and compare the fortunes of political leaders. Exploring its utility in analyzing incumbent resiliency in the specific case of former British Prime Minister Tony Blair, the authors concluded "the LCI has the potential to provide a rich, nuanced, comparative and diachronic analysis of political leadership" owing to its focus on relational linkages to supporters and allies (Bennister et al., 2015: 435).

Group/organizational level antecedents: elite/party/parliament/government attributes

Democratic elite bargaining and succession. Another sub-category of studies examines how elite relationships, perceptions, shared preferences, and exchanges within party structures influence who is chosen, and how they are chosen, to lead. This group of studies includes six analyses by O'Brien (2015); Greene and Haber (2016); Ennsen-Jedenastik and Müller (2015); Malamud (2015); Horiuchi et al. (2015); and Bolleyer and Bytzeck (2017). Scholars here aimed to move beyond institutional settings of leadership selection or situational influences such as economic conditions to explain succession. Horiuchi et al. (2015), for example, proposed a perceptual theory of leadership survival that focuses on the expectations of party constituents who have the power to remove leaders. They surmised that because constituents remember political stances and recall efficacy, some predecessors are much 'harder acts to follow' than others. Consequently, they show that these perceptions explain differential leader survival rates regardless of the extant rules concerning leader removal and replacement. O'Brien (2015) showed gendered political

opportunity structures are shaped by parties' political performance. Namely, women are more likely to retain office when parties gain seats, but more likely to lose office when performance begins to erode.

In a similar vein, Greene and Haber (2016) developed and tested a theory of intraparty preferences and leader selection predicated on the hypothesis that a party's electoral context influences its preference diversity. Sensitive to perceptions of environmental conditions like health of the economy, they showed intraparty heterogeneity likely influences the amount of "cohesion between the party's leaders and their ability to negotiate with potential coalition partners or on policy agreements (Greene & Haber, 2016: 629)." Ensser-Jedenastik and Müller (2015) claimed that organizational and behavioral characteristics of the leadership selection and removal process impact the odds of party leader change. Exploring their hypotheses in a study of Austrian parties, they found electoral success and institutional intra-party factors to be the most significant determinants of party leader survival. Malamud (2015) proposed that the Argentine collapse of 2001 featuring the resignation of two presidents was in fact heavily guided by an identifiable set of sub-national executives – mainly Peronist party mayors and governors – whose resiliency ensured an unappreciated continuity in that period's apparently chaotic politics. Finally, Bolleyer and Bytzek (2017) showed that party organizational characteristics (i.e. party origin, time for party building, and leadership continuity) influenced party capacity to sustain electoral support after breakthrough.

Environmental level antecedents: cultural, economic, political, &/or institutional attributes

Democratic rules and succession. Of the nineteen studies of succession in democratic systems, the largest category of attention concerned "Democratic Rules and Succession." Institutional analysis is a traditional method of examining leadership processes, focusing on the formal and informal rules of selection. Our collection reflects this approach. One well-established approach to studying political succession is to focus on who chooses the leader, a group of individuals known as the electorate. In our collection analysts such as Kenig (2008, 2009), Cross and Blais (2012), Wauters (2014), Faucher (2015), and Matthews (2016) study the democratization of leadership selection rules, particularly concerning the "widening" of the electorate to include grass-roots members in what some define as a "participatory revolution" (Punnett, 1993 as quoted in Matthews, 2016: 905). Of these the most impactful assessments are found by Kenig (2009) who offered a more complex method of classifying key aspects of leadership selection, and who in another study found wider electorates do produce a wider field of contestants, albeit along with less competitive contests (Kenig, 2008). Adopting a slightly different tack by examining candidate selection rules at multiple levels of politics, Barnea and Rahat (2007) showed that the frequency of reform in candidate selection methods increases when external and internal environments are more competitive.

A longstanding method of studying succession rules in politics is to focus on legal and constitutional rules overarching leader selection. Authors of three papers adopt this method to probe the constitutional and legal adequacy of American executive succession procedures in the context of a 2010 Fordham Law School symposium. Treanor's introductory essay noted the rules governing succession have evolved considerably over the last two centuries. However, there are still a number of critical gaps in the law, and the "potential for disaster remains real (Treanor, 2010: 779)." Baker and FitzPatrick (2010) then reviewed several problematic scenarios concerning executive succession drawn from political drama and presidential history to underscore that power transfer should be seamless when the American president is incapacitated or absent. Analyzing the *Presidential Succession Act of 1947*, Fleming (2010) suggested three minor changes to it that would ensure succession protocols access persons with considerable executive experience while ensuring the principle of legislative succession remains intact.

Group/organizational level consequences: elite/party/parliament/government attributes

Succession and electoral consequences. In the final sub-category of democratic studies, a couple of scholars consider how leadership change may influence voters. Lehrer (2012) investigated the relationship between the kinds of people who control party leadership selection and the party's responsiveness to voters. He finds that intra-party institutions (inclusiveness versus exclusiveness) are decisive with respect to which groups the party (dis)enfranchises in the leadership selection (i.e. their mean supporters' or the median voters' position). In a similar vein, Somer-Topcu (2017), using data from seven Western European democracies, showed that leadership change reduced voter disagreement about party policy positions.

Non-democratic systems

Group/organizational level antecedents: elite/party/parliament/government attributes

Non-democratic elite bargaining and succession. Our search located 27 articles concerning political succession in non-democratic systems. It may seem unusual that there is more attention to non-democratic systems than democratic ones. However, because elite control is at the heart of non-democratic governance, and because effecting a peaceful transfer of power in autocracies is often difficult, the weight of analysis in this field tends to focus heavily on how small, highly privileged ruling groups retain power. The topics of democratic and non-democratic elite bargaining and succession have been extensively studied in POs. However, their counterparts, e.g. board and TMT negotiations and succession, have been rarely studied in PTOs and POFOs, probably because these negotiations happen privately behind closed doors.

In view of the above, a large category of articles concerns the mechanics and dynamics of inter-elite bargaining and succession. Among these are Magaloni's (2008) widely-cited study of credible power sharing arrangements under autocracy, Hale's (2005) analysis of elite collective action and regime cycles, and Hoffmann's (2009) study of Cuba's post-Fidel Castro succession. Within this theme a few scholars focus on familial power transfer, such as Brownlee's (2007) study of hereditary succession in modern autocracies, and Kokkonen and Sundell's (2014) treatment of the virtues of primogeniture, that is, the right of succession belonging to first-born children, mostly first-born sons, in ensuring autocratic stability.

Some analysts studied elite bargaining and succession events in light of progress towards democratization. Donno (2013), for example, found that the effect of internal and international pressure on democratization is contingent on the type of authoritarian regime (competitive versus hegemonic) and that the greater susceptibility to pressure explains why competitive authoritarian elections are more likely to lead to democracy. With a similar view towards explaining the effect of civil society along with external Western elites on Joyce Banda's rise to power in Malawi, Gabay (2014) underscored domestic and global political economy as key drivers in Malawi's postcolonial era.

As well, we located several case studies of inter-elite bargaining concerning succession in countries such as Iran, Russia, and Azerbaijan. Thoughtfully evaluating several scenarios concerning the exit of Ayatollah Khamenei, Jones (2011: 120–121) concluded that "the succession process...will be a high-stakes and brutal showdown conditioned more by the politics of the moment than by the provisions of the constitution." Blank (2008) similarly investigated succession in post-Soviet Russia from the perspective of Tsarist patrimony, concluding the state's foundations are inherently unstable. With respect to Azerbaijan, Radnitz (2012) traced the efforts of President Heydar Aliyev in managing internal conflict and passing the post to his son, concluding that scholars of post-Soviet politics err when they take the unitary state for granted. Herron (2011) and Stacher (2008) examined authoritarian elections to uncover how they ensure a ruling regime's dominance and

Table 4

Number of studies published in each theme/category in publicly-traded, privately-owned, & political organizations.

Category	Number of studies published in publicly-traded organizations literature	Number of studies published in privately-owned/family organizations literature	Number of studies published in political organizations literature
Antecedents of leadership succession			
Individual			
Leader attributes: Leader (incumbent/successor) characteristics, behavior, ownership, compensation, risk, performance, &/or legitimacy	13	5	Democratic (D): 1 Non-Democratic (ND): 0 Mixed (M): 1
Group/organization			
Board/TMT/firm attributes: Board/TMT/firm characteristics, behavior, ownership, (compensation), risk, performance, legitimacy, &/or strategic change	16	4	D: 6 ND: 18 M: 3
QR Elite/party/parliament/government attributes: Elite/party/parliament/government characteristics, behavior, ownership, risk, performance, legitimacy, &/or strategic change			
Environment			
Cultural, economic, political, &/or institutional attributes	7	0	D: 10 ND: 5 M: 2
Event, characteristics, and theories of leadership succession			
Event			
Leader change	3	0	D: 0 ND: 0 M: 0
Characteristics			
Internal/external succession or Intra-family/extra-family succession	6	11	D: 0 ND: 0 M: 0
Planned succession (moving forward, completed term, retirement)/unplanned succession (death, illness, dismissal, resignation, interim)	6	6	D: 0 ND: 4 M: 0
QR Regular political succession (elections, appointment, heredity, etc.)/irregular political succession (coup, revolution, conflict, etc.)			
Theories			
Theories explaining leadership succession	0	4	0
Consequences of leadership succession			
Individual			
Leader attributes: Leader characteristics, behavior, ownership, compensation, risk, performance, &/or legitimacy	2	2	D: 0 ND: 0 M: 0
Group/organization			
Board/TMT/firm attributes: Board/TMT/firm characteristics, behavior, ownership, (compensation), risk, performance, legitimacy, &/or strategic change	22	17	D: 2 ND: 0 M: 0
QR Elite/party/parliament/government attributes: Elite/party/parliament/government characteristics, behavior, ownership, risk, performance, legitimacy, &/or strategic change			
Environment			
Cultural, economic, political, &/or institutional attributes	0	0	D: 0 ND: 0 M: 1
Total	75	49	53

pre-empt opposition challenges.

Environmental level antecedents: cultural, economic, political, &/or institutional attributes

Non-democratic institutions and succession. The effects of democratic and non-democratic external factors (e.g. rules, institutions, etc.) on succession have been extensively studied in POs. The impact of such external factors on succession has also been fairly well studied in PTOs but not POFOS. In examining how scholars are studying leadership succession in non-democratic systems, we discerned another category of articles sharing an institutional focus. In an important analysis, [Gandhi and Przeworski \(2007\)](#) found authoritarian rulers rely on nominally democratic institutions for political survival when they need to solicit the cooperation of outsiders or deter the threat of rebellion. Similarly, [Frantz and Stein \(2017\)](#) found that succession rules, like other pseudo-democratic institutions, provide survival benefits for dictators because they reduce the incentives supporting a

coup, or a forceful grab for power. [Zeng \(2013\)](#) found that institutionalized party rules that have developed over a long period are key to understanding what matters most in the selection of China's leaders. [Cheeseman \(2010\)](#) argued open-seat polls (i.e. where no incumbent vies for election) are especially likely to produce opposition victories in sub-Saharan Africa, and so work towards democratic progress. Finally, [Nalepa and Powell \(2016\)](#) found that under a weak International Criminal Court (ICC) regime, the more the opposition had engaged in criminal forms of dissidence, the more likely was the dictator to peacefully relinquish power. If the ICC is strong, the degree of the opposition's engagement in criminal forms of dissidence mostly has no effect on the dictator's likelihood of exiting.

Event, characteristics, and theories of leadership succession

Regular and irregular succession. Observing that non-democratic successions often hinge on the fates of outgoing dictators (e.g. resignation, retirement, natural death, exile, imprisonment,

assassination, execution, etc.), several analysts such as [Goemans \(2008\)](#), [Escríbà-Folch \(2013\)](#), [Albertus and Menaldo \(2014\)](#), and [Tanaka \(2016\)](#) studied the manner [regular succession (election, appointment, heredity, etc.) versus irregular succession (coup, revolution, conflict, etc.)] and consequences of losing office with respect to managing leader succession. Similar studies have been conducted on planned/unplanned successions in PTOs and POFOs.

Mixed systems

Individual level antecedents: leader attributes

Women's political leadership worldwide and succession. The final group of articles examined succession across mixed systems, i.e., democratic and non-democratic systems. The current subcategory includes a single paper examining women's worldwide political leadership by [Jalalzai and Krook \(2010\)](#). In considering what factors explain the increased election of women within some states but not others, the authors examined both executive and legislative participation rates to conclude that gendered power dynamics are still very much at work in the political sphere. They noted the enduring natures of elite discrimination against women and other non-dominant groups, finding that some key "demand-side factors" explain why policies such as party gender quotas have been unevenly successful across states.

Group/organization level antecedents: elite/party/parliament/government attributes

Presidential systems and succession. Three articles concerned the relation between presidential systems and succession. [Marsteinredet and Berntzen \(2008\)](#) engaged Linz's astute observation that presidentialism is a rigid regime which creates political conflict that can overwhelm it. They found the pattern of presidential interruptions over the last 28 years suggested Latin American presidentialism is no longer marked by rigidity and reduced democratic legitimacy. In a conceptual follow-up study, [Marsteinredet \(2014\)](#) presented a typology of crises and presidential interruptions to help compare cases of executive instability. Examining presidents who face term limits, [Bature \(2010\)](#) showed it is the magnitude of political spoils along with the probability of retaining them that lures presidents to try to overstay their limited tenure.

Environmental level antecedents: cultural, economic, political, &/or institutional attributes

Incentive structures, rents, and succession. Another research question asks: What sorts of incentives influence succession in mixed systems? [Konrad and Skaperdas \(2007\)](#) presented a game theoretic treatment demonstrating in the abstract that allowing individuals to compete to succeed a leader, while retaining key assets such as life and property in the event of a loss, is optimal for the leader. More recently, [Debs \(2016\)](#) argued military dictators are more likely to transition quickly to democracy than other kinds of dictators because they expect democratic successors to use less violence and thus expect a large improvement in their post-tenure fate.

Environmental level consequences: cultural, economic, political, &/or institutional attributes

Succession and incentive structures and rents. [Konrad and Mui \(2017\)](#) in another game theoretic treatment analyzed the benefits that may accrue when leaders appoint successors. They found that appointing a successor may make a coup more attractive for the successor and less attractive for the other members of the elite. They also determined conditions when the overall effect of appointing a successor benefits the leader and enables him to acquire a larger share of the governance rent in equilibrium. In the next three sections we turn to discuss future directions for leadership succession in publicly-traded, privately-owned, and political organizations.

Future directions for leadership succession in publicly-traded, privately-owned, and political organizations

This section discusses important future research questions/directions that we believe are critical to better understand and move forward the field of leadership succession in PTOs, POFOs, and POs in the near future. These future directions emerged either from our literature review of leadership succession in each of the three literatures or from comparing each one of these literatures with its counterparts to identify areas in which researchers in these literatures can learn from or provide insights to their counterparts in the other literatures. While some of the gaps among the three literatures are detectable by comparing [Tables 1, 2, and 3](#), and looking at [Table 4](#), in this section we focus on what we consider the most important and impactful topics for evolving the field and driving it forward in the near future based on what we uncovered in our literature review.

Leadership succession and organizational performance/outcomes

Our review of the literature on leadership succession in PTOs shows the relationship between leadership succession and organizational outcomes, especially organizational performance, as the area that draws the most attention, perhaps due to its importance to practitioners. Most studies on leadership succession in PTOs used financial measures, such as ROA, to account for organizational performance. Very few studies on leadership succession in PTOs used the other measures suggested by [Rowe and Morrow Jr. \(1999\)](#), particularly corporate social responsibility. In our set of papers on leadership succession in PTOs, only [Bernard et al. \(2016\)](#) considered corporate social performance. Given the gradual shift in strategy towards the triple bottom line (profit, people, and planet) ([Rothaermel, 2015](#)), we believe it is time for leadership succession researchers of PTOs and the other two types of organizations to start studying the impact of leadership succession on performance measures other than financial performance. Recently some firms that ignored their social responsibilities have suffered multiple leader successions in very short time periods. Examples include, but are not limited to, Wells Fargo ([Merle, 2016](#)), Volkswagen ([Gibson, 2015](#)), and British Petroleum ([Mason, 2010](#)).

An important research question, both theoretically and empirically, then becomes whether a leader should be fired immediately following a scandal despite an organization's successful financial/economic performance? If so, should organizations promote internally, hire externally, or appoint an interim leader until they find the "right" chief? There is a wealth of research on this area in PTOs but not as much in POFOs or POs, probably because unplanned successions are less frequent and successors are generally more known in advance in these two other types of organizations.

We also believe using different performance measures may be of importance to the political succession literature. Using/developing "people and/or planet" performance measures – such as Gross National Happiness (GNH) ([Tideman, 2016](#)) among others – in addition to measures such as deficits/surpluses and/or debt to GDP (analogous to financial performance measures for PTOs and POFOs) may be interesting for the political science field in general and the political leadership succession sub-field in particular. A similar question could be asked in the political arena: Following a scandal should the leader resign immediately? If so, should the vice leader be promoted or should a search for an outsider be undertaken, or a neutral custodian be appointed until a new leader emerges? Some countries have clearer emergency succession processes than others; it would be interesting to compare the outcomes of such emergency successions between countries with clearer emergency succession processes and countries with no such clear processes. This research could help political entities avoid chaos when scandals occur. While studying the impact of scandals on succession ([James, Wooten, & Dushek, 2011](#)) is an important venue for all organizations, understanding what led to an organization's corporate

social irresponsibility, e.g., the leader's characteristics or compensation package composition, social and political embeddedness, among others may be highly informative in vetting new candidates for leadership positions.

Leader characteristics are not the only factors that affect post-succession performance. [Bilgili et al. \(2017\)](#) find that organizations play a role in improving post-succession performance by influencing the perceptions of shareholders of the firm undergoing succession through organizational narratives. While this is an important finding for PTOs, it can also be interesting for POFOs and POs. It is interesting to theoretically find the components of a political speech post succession that can unite voters/constituents around the elected/appointed leader. It is also interesting to empirically compare winning speeches and dissect their components and study their impact on the degree of unity of the members of POs. We believe this can have an important impact on the practice of political leadership succession.

Another organizational outcome of interest for PTOs is strategic change. Previously, researchers tended to believe that insiders are trained by their predecessors and hence are psychologically and cognitively attached to the current strategy of the firm and so may not induce strategic change ([Bigley & Wiersema, 2002](#)). More recent studies take into consideration additional factors that may affect new CEOs' abilities to induce change such as their origin, insiders versus outsiders, their alignment with their predecessors' thinking, and whether the predecessor departs the firm or is retained as board chair after succession occurs ([Karaevli & Zajac, 2013](#); [Nakauchi & Wiersema, 2015](#); [Quigley & Hambrick, 2012](#); [Zhang & Rajagopalan, 2010](#)). Yet still much remains unanswered. Despite the multiple calls to use qualitative methods in CEO succession studies ([André, 2009](#); [Berns & Klarner, 2017](#); [Giambatista et al., 2005](#)), there is a dearth of qualitative studies in PTOs. Qualitative studies are very common in POs, and are becoming more accepted and valued in the strategy field ([Bansal & Corley, 2011, 2012](#); [Langley & Abdallah, 2011](#)). It might be the right time for business leadership succession researchers to use qualitative research to complement findings from quantitative research ([Lee, 1991](#); [Miller, 2005](#)). [Zhang and Rajagopalan \(2010\)](#) called for qualitative and survey studies to help better understand the differences in the change dynamics between outside and inside CEOs. Qualitative studies may also be more suited to assess whether a strategic change is in the mandate of the CEO. Given that inside CEOs are usually promoted in successful organizations and boards are generally not in favor of major strategic changes in such cases. Whereas outside CEOs are usually recruited with the mandate to induce important strategic changes. We believe that this would affect the interpretation of results if we only look at publicly available data. We think taking into consideration qualitative studies that help us comprehend the new CEO's mandate would help researchers and practitioners better understand the factors that drive strategic change.

While the field of political science may enrich the methodology of the PTOs' succession field, we believe borrowing the concept of strategic change may enrich political succession studies. Similar to questions raised for PTOs, political science researchers can ask whether just a change in the political mindset of the new leader, from liberal to conservative or vice versa (i.e., a successor characteristic), should lead to a strategic change in a government's direction even if the government did well under the previous leader, or whether change should affect only certain areas but not others. To achieve this, strategic change should be conceptualized and measured at the country or party level then POs' researchers can collect data at the country or party level following several successions that took place.

One obvious difference we noticed in comparing the research on leadership succession and performance in the three literatures is the minimal concern political scientists devote to the relationship between successor characteristics and performance. The CEO succession literature in business is well stocked with examinations comparing whether "insider" candidates who become leaders outperform "outsider"

candidates. As well, other kinds of characteristics, such as gender, are considered when assessing the organizational impact of leader choice in business organizations whether PTOs or POFOs. However, our collection of political analyses leaves the question of how leader characteristics may influence key performance outcomes, such as party cohesion, candidate recruitment, or voter perception, largely unaddressed. Which characteristics are more important for political leaders and why (e.g. integrity, charisma, diplomacy, persistence, flexibility, etc.)? How does leader succession influence political performance? While a few analysts engage in such questions, like [Bolleyer and Bytzek \(2017\)](#), along with [Ennsler-Jedenastik and Müller \(2015\)](#), these questions merit much more focus.

Our review of the literature on performance before and after leadership succession in POFOs showed the following. First, our review identified only four recent impactful articles studying the important effect of family firm performance on leadership succession in POFOs ([André, 2009](#); [González et al., 2015](#); [Hillier & McColgan, 2009](#); [Tsai et al., 2009](#)). [Hillier and McColgan \(2009\)](#) showed that family CEOs were less likely than non-family CEOs to depart their positions following poor family firm performance. However, [André \(2009\)](#) criticized [Hillier and McColgan's \(2009\)](#) study suggesting it had several issues, such as performance measurement and sample selection among others and thus arguing this relationship required further investigation. Given the important research and practical implications of such a relationship, we believe more research needs to be done on this important relationship to have more evidence either supporting or rejecting [Hillier and McColgan's \(2009\)](#) conclusion. More insight on this relationship in family firms may also, distantly and indirectly help inform relationships in monarchies in political succession, since it is almost impossible to conduct similar studies on monarchies, given that by definition when a successor is not from the ruling family the rule of the monarchy has ended.

Second, our review also identified some recent impactful articles studying the important effect of family versus non-family CEO succession on family firm performance. For example, [Pérez-González \(2006\)](#), [Bennedsen et al. \(2007\)](#), and [Cucculelli and Micucci \(2008\)](#) found that family CEO successions, as compared to non-family professional CEO successions, had a negative impact on family firm performance. However, it is obvious from the literature and from real-life experience that, despite these findings, families tend to prefer intra-family successions over extra family successions. Nonetheless, only very recently, [Pan et al. \(2018\)](#) examined a factor – corporate philanthropy – that could help mitigate the negative impact of family-CEO succession on family firm performance. We believe more studies are needed to investigate additional factors, moderators, and mediators that may mitigate this important family CEO succession-performance relationship. This relationship also suggests that when families pass the baton to family members, they have in mind considerations other than just short-term financial performance (e.g., long-term family firm survival, longevity, etc.). Future research needs to uncover what these considerations are that may be as important, if not more important, to family firm CEO incumbents, than their firm's short-term performance. This may also indirectly inform political leadership succession in monarchies and dictatorships, in which the survival, continuity, and longevity of these monarchies and dictatorships may become more important to incumbents than how well they are serving their people.

Leadership succession and gender/primogeniture

Our review of the recent impactful literature on leadership succession and gender/primogeniture in POFOs identified only two articles ([Haberman & Danes, 2007](#); [Vera & Dean, 2005](#)) despite the importance of implicit and/or explicit gender/primogeniture considerations in the successor selection process in family firms. These considerations are not only important in leadership succession in family firms but may be even more important in leadership successions in POs such as monarchies

and dictatorships. The two articles we identified generally discuss the challenges daughters face in family business succession and find that male first-child firms are more likely to pass on control to a family CEO than are female first-child firms. For instance, in the Middle East, when it comes to inheritance and tax law, many countries' inheritance and tax laws follow religious/sectarian laws that are very different from Western civil law and, in certain cases, may prohibit transferring wealth (in family businesses) or power (in monarchies) to daughters.

That said, we are in an era in which gender equity in general and in leadership succession in particular is increasing around the world. However, this progress is still generally fairly slow, but faster in some parts of the world than others. This suggests several timely research questions need to be addressed in the near future. Research questions such as: how do culture-, country-, and/or region-specific gender-related beliefs, norms, practices, etc. differentially influence succession processes and outcomes in family firms (and monarchies)? Do egalitarian families (monarchs) distribute ownership and leadership of their family firms (monarchies) among their male and female children, and if so how? How are the media in general and the social media in particular influencing perceptions on gender and how is this influencing leadership succession processes and decisions in privately-owned/family firms (and monarchies)?

Moreover, in the leadership succession in POs literature, there is a clear need for more sustained and comprehensive research on the feminization of political elites and their role in succession processes. We argue the same for the other two literatures. We need to know more about what sorts of women are populating business and political elites, how they negotiate among and between groups, and how they approach power. In the conclusion of her study of gender, political performance, and party leadership, O'Brien (2015: 1036) points out that "parties are themselves fundamentally gendered institutions," and so "incorporating gender will thus shed new light on the "black box" of intraparty politics." Jalalzai and Krook (2010: 19) survey the global feminization trend in legislatures across the globe, noting that while there are record numbers of women in cabinet positions, politics is still largely viewed as "a man's world." In light of our search revealing only 2% of the POs' articles (one of 53 studies) substantively focused on the role of gender, we conclude there is much necessity to understand how gender affects, and is affected by, change in political executives.

Leader tenure

CEO tenure is used to predict many dependent variables in the CEO succession literature including organizational performance. While the CEO position is known to be demanding, we see many CEOs reluctant to let go of their organizations especially if the organization is successful. Leaders in family businesses enjoy longer tenures and are more entrenched than in PTOs (Oswald & Muse, 2009). Dangerously though, CEO reluctance to leave may lead to the exit of very capable successors (Cannella & Shen, 2001; Lehmberg, Rowe, White, & Phillips, 2009) who lose hope of reaching the CEO position. Lehmberg et al. (2009) studied the impact on firm performance when firms hired executives who had left General Electric during the twenty year tenure of Jack Welch.

In addition, Henderson, Miller, and Hambrick (2006) found that firm performance has an inverted U-shaped relation with CEO tenure, hence the relation between CEO tenure and firm performance is first positive then becomes negative beyond a certain point in time and it turns negative earlier in more dynamic, than in less dynamic, industries. While this is one of the very few academic studies discussing CEOs' tenure, albeit indirectly, practitioners and consultants are still expressing concerns about "open" terms for CEOs. Mader (2006) and Whitehead (2011) have supported term limits. They state that CEOs should have an optimum time to serve irrespective of their age. For example, the Governor of Central Bank of Kenya, Patrick Njorge, is in favor of setting a limited term for CEOs after some of the veteran CEOs failed to pay their loans (Herbling, 2016). Others disagree. Myatt

(2013) and Abou-El-Fotouh (2018) argue that good leadership is hard to find and they support the retention of good CEOs irrespective of their tenure length. Sonnenfeld (2015) argues that it depends on the CEO whether he or she is a monarch who would like to stay at the helm indefinitely, or a general who returns to the company to save it, or an ambassador who trains an heir apparent to succeed him/her and then leaves, or a governor with a short but effective term at the office.

Yet if we look at the sibling field of political succession, especially in democratic systems with explicit term limit laws, no matter how successful or popular are the leaders, they have to cede their position upon completion of their term. Although defined leadership terms may apply in some PTOs and POFOS, such as Deloitte, which imposes a tenure limited to two consecutive four-year terms (Bradt, 2018; Mount, 2013), and many universities which impose similar kinds of defined terms on their presidents, it may be advantageous for firms to experiment with such defined leadership terms and may be interesting for business researchers to investigate whether defined or undefined terms result in better succession and performance. PTO scholars may extend Henderson et al.'s (2006) study and compare the effect of CEOs' tenure on firm performance in limited term firms with unlimited term firms and across industries. Optimization models can be used to identify the optimal tenures of CEOs in different industries.

Leader removal/dismissal

CEO dismissal in PTOs research has been directly linked to firm financial performance. Researchers found that poor financial performance is the major cause for CEO dismissal; however, more recently researchers found mitigating factors, such as structural power (Pi & Lowe, 2011) and political connectedness (You & Du, 2012), that might affect this relationship, keeping a poor performer in the CEO position. This research has been conducted in the Chinese context mainly and given that China has a unique political system in which political connectedness may have more influence than in other contexts, it might be interesting to validate this research in different cultures. There is less research done on leader dismissal in POs and POFOS and probably for valid reasons. However, it might be interesting to study the mitigating factors that might influence the removal of poor performers in these two fields. Understanding the mitigating factors might enrich these two fields both theoretically and empirically and might improve practice. Understanding what prevents dismissal of poor performers may motivate the custodians of the succession process to seek removal of these leaders through the appropriate channels when necessary.

The "participatory revolution" and succession

Our review of leadership succession in POs showed that along with the entry of larger numbers of women into modern political executives, another group of newcomers merits much more analytical attention in future research. Our analysis suggests several leading scholars, including Kenig (2009), Kenig (2008), Cross and Blais (2012), and Barnea and Rahat (2007), are concentrating attention on the "participatory revolution" that is underway within the selectorates of many democracies. This is meritorious as efforts to expand the group controlling party leader selection in democratic systems carries with it a host of consequences that are only now beginning to be articulated. Indeed, several of the analyses in our collection of political democratic studies are not designed to consider a changing electorate. For example, in the conclusion of his study of how change in the party leader reduces voter disagreement about party positions, Somer-Topcu underscores that his analysis is limited in this regard. He writes: "we do not know whether the process of leadership selection influences voter perceptions. Do voters learn more about party positions when the party members elect the party leader in a one-member, one-vote system as compared to selection by the party executive committee?" (2017: 7). We need to know more about what the democratization of the electorate implies

for the process and result of executive succession.

Leadership succession and institutions

Our review of leadership succession in POs also demonstrated there is ample focus on the role of institutions across democratic and non-democratic systems with respect to understanding succession. There is much attention because institutions matter significantly in how successions unfold and in their consequences. Moreover, institutional effects often are subtle and counter-intuitive, revealed only through careful analysis. Going forward, several analysts recommend devoting more attention to key institutional factors, particularly in how they interact with other elements and factors. Kenig (2009), Wauters (2014), Horiuchi et al. (2015), Konrad and Mui (2017), and Frantz and Stein (2017), among others, emphasize the need to pursue additional research focused on institutional factors, along with situational and perhaps psychological factors, to fully explore the role of institutions in leadership succession. As Ennser-Jedenastik and Müller (2015) conclude, research on party leader survival is very much in its infancy, and so a better understanding of the institutional determinants of leader selection and deselection is crucial for students of democratic politics.

Leadership succession around the world

This section discusses future directions related to factors affecting succession in different cultures, countries, and regions. Our review of leadership succession in POFOs identified several articles that studied leadership succession in POFOs in distinct single countries, such as in Italy, Lebanon, China, Turkey, etc. (Cucculelli & Micucci, 2008; Fahed-Sreih & Djoundourian, 2006; Tatoglu et al., 2008; Yan & Sorenson, 2006). Except for Yan and Sorenson (2006), these and the other articles on leadership succession in POFOs have rarely, if at all, investigated in any depth the impact of the culture, country, or region in which these studies were conducted on the succession process. In contrast, a good number of the political leadership succession articles included comparative studies among countries. However, among the POFO succession articles, only Carney et al. (2014) comparatively studied the divergent impact of inheritance law in four different countries (Germany, France, Hong Kong, and USA) on succession and continuity in family firms.

Thus, more comparative cultural, national, and regional studies on leadership succession in POFOs and PTOs are needed to help better understand the impact of various external factors (e.g. demographic, economic, legal, institutional, etc.) on leadership succession in these organizations. For instance, certain cultures, such as those with strong traditions of long-term orientation and social obligations, may facilitate specific types of succession over others. Moreover, in certain national or regional cultures intra-family successions may be more or less common and/or legitimate than others, the same way in certain national or regional cultures democratic or non-democratic political leadership successions may be more or less common and/or legitimate than others. Studying the impact of various external factors related to cultural, national, and regional differences on leadership succession in all three organizational types would significantly advance our understanding of leadership succession in different international contexts.

What business and political successions may learn (from each other)

In this paper we reviewed the literatures on leadership succession in PTOs, POFOs, and POs. We also proposed future directions that we believe are critical to move forward the leadership succession field in the three areas in the near future. In this concluding section, based on Fig. 1, Tables 1, 2, 3, and 4 (and particularly Table 4), and our literature review and future directions sections, we further integrate the three literatures on leadership succession by discussing their similarities and

differences, what all three literatures may learn from this review, what each literature may learn from the other literatures, and what additional important research questions should be studied in the near future.

Similarities among the three literatures (and what all three literatures may learn from this review)

Among other things, our literature review and future directions sections revealed the following similarities. All three literatures have limitedly studied the relationship between gender (and primogeniture) and succession; given the timeliness of this topic, we think all three literatures can benefit from a deeper understanding of this relationship and its implications.

Reviewing Fig. 1, Tables 1, 2, 3, and 4 (and particularly Table 4) and our literature review and future directions sections revealed the following additional similarities that were not discussed in the three previous future directions sections. First, characteristics of leadership successions, namely, planned versus unplanned business successions and regular versus irregular political successions, have been fairly well studied in all three literatures; yet, given the benefits of planned business successions and regular political successions and the detriments of unplanned business successions and irregular political successions we think more research examining leadership succession characteristics in general and what factors increase the likelihood of planned and regular successions and decrease the likelihood of unplanned and irregular successions in particular would significantly advance leadership succession research and practice.

Second, the impact of succession on leaders' attributes has been limitedly studied in all three literatures, particularly in POs; given John Acton's famous quote "Power tends to corrupt and absolute power corrupts absolutely," conducting research examining whether/how becoming a leader changes a person's behavior in general and examining how valid such quotes are would be interesting and useful to succession researchers and practitioners.

Third, the effect of succession on environmental attributes (cultural, economic, political, and/or institutional attributes) has been barely studied in all three literatures; although one would expect environmental attributes to impact leaders' succession more than one would expect leaders' succession to impact environmental attributes, many new leaders significantly impact their environments, such as the industries, institutions, political landscapes, or the other environments they operate in; investigating what incoming leaders' attributes may lead to such environmental changes can advance succession research and practice.

Differences among the three literatures (and what each literature may learn from the others)

Among other things, our literature review and future directions sections revealed the following differences. Leader attributes and succession has been well studied in PTOs and POFOs but limitedly studied in POs; understanding how, when, and what leader characteristics impact succession and performance in all three organizations, but particularly in POs, will enrich the understanding of leadership succession researchers and practitioners in all three literatures.

Moreover, organizational performance before and after succession has been studied in PTOs and POFOs but barely in POs; given the importance of these relationships we think that all three literatures, but particularly the POs literature, can benefit from further examining these relationships in new ways and using additional organization-relevant measures of performance.

Furthermore, leader term limits have been studied in POs (Maltz, 2007) but rarely in PTOs and POFOs. Given the significant implications of term limits in politics, one may wonder whether term limits would have similar implications in business. Investigating whether, why, how,

and when leader term limits would benefit or hurt business organizations may be a fruitful avenue for future research on leadership succession in business organizations.

Reviewing Fig. 1, Tables 1, 2, 3, and 4 (and particularly Table 4) and our literature review and future directions sections revealed the following additional differences that were not discussed in the three previous future directions sections.

First, the impact of environmental attributes (cultural, economic, political, and/or institutional attributes) on succession has been studied in PTOs and POs but barely in POFOs. Studying the impact of environmental attributes on succession in POFOs (e.g. studying the impact of family norms in different cultures/countries on succession) would advance leadership succession research and practice in POFOs in particular and succession research and practice in the field in general.

Second, characteristics of leadership successions, namely, internal versus external successions and intra-family versus extra-family successions, have been well studied in PTOs and POFOs but limitedly studied in POs. Studying presidential, prime ministerial, etc. intra-party (i.e. from the same party) versus extra-party (i.e. from another party) successions and their effects on countries' policies, economies, security situations, etc. may advance leadership succession research and practice in POs.

Third, our review located some theory papers attempting to broadly

explain the leadership succession phenomenon in POFOs but barely any theory papers attempting to broadly explain this phenomenon in PTOs or POs. We hope this observation encourages researchers and practitioners from the three leadership succession areas to collaborate more and learn from one another in both research and practice to ideally develop a general normative theory of leadership succession, since such a scholarly theory does not exist yet and its existence would certainly help move the scholarly leadership succession field forward and better guide practitioners in their succession decisions.

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Appendix A

Table A.1

Leadership succession articles that include hybrid samples from both publicly-traded organizations (PTOs) and privately-owned/family organizations (POFOs).

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Further reading

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Leading day-to-day: A review of the daily causes and consequences of leadership behaviors[☆]



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ABSTRACT

A recent trend in leadership research is to explore the daily causes and consequences of leadership behaviors. As this type of research has grown dramatically in the past several years, we seek to provide a systematic review of existing empirical research that has used a daily ESM study design to examine the leadership process. In this review, we reflect on the unique and important benefits a daily perspective on leadership provides for leadership research. We also provide a systematic review of the existing research on daily leadership, discuss the methodological and theoretical aspects of the studies identified in the review, and highlight the important findings of this research. Finally, we conclude by drawing upon the reviewed articles to provide recommendations for future scholarly work. Specifically, we give recommendations that will both broaden scholars' understanding of the daily leadership process as well as deepen understanding.

Every workday, leaders are responsible for the performance and well-being of their followers, and the ways in which leaders interact with their followers may differ from day to day or even within the day. For example, research shows that ethical behavior – such as role-modeling ethical behaviors to followers – drains leaders' ego resources, which increases the likelihood that they will behave more abusively towards their followers the next day (Lin, Ma, & Johnson, 2016). This and other studies show that leadership is a daily and fluctuating phenomenon. Prior scholarly work in the leadership field has primarily explored the consequences of leaders' general behavioral patterns on follower outcomes (e.g., some leaders are generally more abusive than others, and how does that affect followers; Tepper, Simon, & Park, 2017). Recently, however, leadership researchers have begun to explore the dynamics of daily leadership behaviors (e.g., some leaders were particularly abusive today, and how does that affect followers; Vogel & Mitchell, 2017). This daily perspective to understand leadership has grown rapidly in the past few years, refining our understanding of leadership, expanding our understanding of the daily consequences of leadership behaviors, and extending our understanding of the immediate origins of leadership behaviors.

The behaviors of all individuals can be explored as general patterns of consistent actions in a trait-like fashion (e.g., Jane is generally helpful), but can also be examined at specific moments in time in a state-like fashion (e.g., Jane was not helpful today). Likewise, leadership behaviors, such as transformational or abusive leader behaviors, can be examined as a general pattern of behavior (e.g., to what extent does your leader inspire you overall?) or as a behavior that fluctuates within short time periods (e.g., did your leader inspire you this morning?). Previous research supports this idea, showing that some leaders are more transformational than others (e.g., Bass, Avolio, Jung, & Berson, 2003; Howell & Avolio, 1993) and that the use of transformational leadership often fluctuates within the same leader on a daily basis (e.g., Breevaart et al., 2014; Tims, Bakker, & Xanthopoulou, 2011). Prior research has also highlighted how followers' daily reports of a leader's behavior are significantly different from their reports of the same leader's general leadership behavior (Hopton, 2016).

In this paper, we look to review existing research that examines the daily causes and consequences of leadership. In doing so, we build on prior reviews that have discussed daily leadership (e.g., McClean, Barnes, Courtright, & Johnson, *in press*; Ohly & Gochmann, 2017).

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First, our review extends the work by McClean et al. (in press)² that reviewed the broader research of changing leadership. While McClean et al. (in press) included a wider range of changing leadership behaviors such as longer-term leader behavioral shifts and leader behavioral growth and decay, we solely focus on daily behaviors. As a consequence, our review is more comprehensive of the daily leadership literature and highlights unique elements and patterns (e.g., methodological practices, theoretical perspectives, types of leader behaviors studied). This allows us to more precisely assess both the strengths and weaknesses in current research. It also allows us to provide more detailed suggestions for future research. Second, our review builds on Ohly and Gochmann's (2017) review of daily leadership, which primarily focused on specifying methodological best practices for daily leadership research. Our review does not provide specific methodological best practices per se, but rather assesses the state of the science in daily leadership to see how it meets current best practices already provided.

Thus, the aim of this manuscript is to review and evaluate previous research examining the daily causes and consequences of leadership behaviors. In doing this, we hope to inform scholars on how previous daily studies of leadership have (and have not) utilized their study designs to theoretically advance leadership knowledge. We believe that by highlighting what has been done in daily leadership studies, we can spark future leadership inquiry by helping scholars look at leadership research through a slightly different lens. In what follows, we first reflect on the value added by studying leadership in a daily fashion. Then, based on our systematic review of the literature, we review the existing empirical research conducted by scholars that has explored leadership on a daily basis. We do this by first summarizing the theories used by articles in our review; second, analyzing the methods used in the articles in our review; and, third reviewing the articles based on the behaviors studied. Finally, in our conclusion, we discuss areas for future research based on our review. We provide suggestions that will push the field forward and establish a road map for further inquiry in daily leadership research.

Importance of examining daily leadership

There are at least three important theoretical and methodological advantages to study daily leadership relations. The first is that scholars are able to examine phenomena and test leadership theories at a within-person level (McCormick, Reeves, Downes, Li, & Ilies, in press). The within-person approach to leadership allows researchers to answer unique research questions that complement the existing nomological network surrounding leadership with novel information on the workings of leadership. Second, understanding daily leadership allows researchers to get an in-depth look at the short term processes of leadership (i.e., the proximal causes and consequences of leadership). It also provides insight into how leadership behaviors unfold over short spans of time (i.e., during the day or from one day to the next). Third, it allows researchers to analyze leadership behaviors in their natural context. Studying daily life of any sort, be it leadership, student life, or parenting, allows researchers to "capture life as it is lived" (Bolger, Davis, & Rafaeli, 2003). Leadership is a complex process, and thus, studying leadership in a daily fashion is critical to fully understand it as it gives unique insight that cannot be easily captured in other ways. Below, we describe each of these three benefits in more detail.

Within-person approach to leadership

Existing leadership research primarily focuses on leadership at a between-person level, studying differences in general patterns of

behaviors between different leaders. These studies provide valuable insights to select individuals for a leadership position. For example, previous research has shown that individuals who score highly on agreeableness and honesty-humility scales are less likely to behave abusively towards their followers (Breevaart & de Vries, 2017). But daily studies on leadership provide unique information to scholars by allowing researchers to explore leadership at another level of analysis – the within-person level – on a daily basis. Even personality, a meaningful way to explain differences between individuals, has been shown to be worth studying on a daily basis to understand within-person relationships (e.g., Fleeson, 2001; Fleeson & Nofle, 2011). And although there are other notable types of within-person studies focusing on leader development over time (e.g., Giambatista, 2004; Kalish & Luria, 2016; Misenko, Guenter, & Day, 2017) or following interventions or changes (e.g., Day & Sin, 2011; Seifert & Yukl, 2010), daily studies are different with their focus on short-term (i.e., daily) within-person relationships in leadership.

Daily within-person leadership studies both challenge the way we view leadership (Dalal, Bhave, & Fiset, 2014) and show how leadership relations exist at multiple levels of analysis. Daily within-persons studies of leadership can show how leader relations that are non-existent at the between-person level exist at a within-person level. For example, at the between-person level, leader abusive behaviors and leader behaviors of consideration and structure initiation are likely to be negatively correlated. However, on a within-person, daily level they have been found to positively relate to each other (*Liao, Yam, Johnson, Liu, & Song, 2018). In a related example, Breevaart et al. (2014) showed that leaders can be transformational, rewarding, and controlling all on the same day. Thus, daily within-person leadership research can change and challenge preconceived relations in leadership.

Daily studies also extend leadership research by showing that relations exist at multiple levels of analysis. This extends theories of leadership by showing that both general leadership behaviors and daily leadership behaviors have implications for leader and follower antecedents and outcomes. Within-person studies demonstrate the need for leaders to behave constructively not only in general but also on a daily basis. For example, transformational leadership at the between-person level of analysis has been found to increase employee job engagement (Zhu, Avolio, & Walumbwa, 2009); daily studies have shown that this relationship also exists at a within-person level of analysis (Breevaart et al., 2014; Tims et al., 2011).

Short-term processes of leadership

Another theoretical and methodological advantage of daily studies of leadership is that they allow researchers to study the complexity of leadership processes as they unfold from one day or situation to the next. Scholars can examine what daily situations trigger different types of constructive (e.g., transformational or servant) and destructive (e.g., abusive or tyrannical) leadership behaviors and better explore the proximal consequences of these leader behaviors. This helps give scholars a deeper and more nuanced view of short-term relationships in leadership. Knowledge of these proximal situational triggers of leadership behaviors have theoretical implications and provide important information to optimize the practice of leadership. For example, Barnes, Lucianetti, Bhave, and Christian (2015) asked leaders when they woke up to indicate how many hours they slept and how well they slept. They found that regardless of the hours of sleep, leaders who reported lower sleep quality in the morning (e.g., waking up throughout the night) also reported having depleted egos, which caused their followers to report they were more abusive that day. Thus, if sleep affects the use of abusive leadership behaviors, organizations could decide to grant their leaders a day off after a night of working overtime, or leaders themselves may decide to work from home the next day.

Daily studies also allow scholars to use more specific variables to test theories and thus uniquely explore the leadership process. Studies

² Of the 74 articles in our review, only 17 were reviewed in the McClean et al. (in press) article.

that use precise, specific variables complement more traditional studies of leadership by allowing scholars to measure and examine leadership processes in different ways. For example, Rosen et al. (2019) explored how daily email demands, instead of just general work demands, in the morning influenced leader behaviors during the day. Similarly, Stocker, Jacobshagen, Krings, Pfister, and Semmer (2014) examined how daily leader appreciation, instead of just general leader support, leads to enhanced follower outcomes for the day. Finally, Ford, Wang, Jin, and Eisenberger (2018) explored how daily leader support increased follower daily gratitude – rather than just positive affect – which increased follower daily organizational citizenship behavior (OCB) and decreased follower counterproductive work behaviors (CWB). Thus, daily studies allow researchers to get deeper insights into specific aspects of daily life and how they relate to the process of leadership.

Daily studies also provide important information on how time affects short-term leadership processes. Daily studies can examine how long the effects of leadership behaviors last for followers and leaders. They can also show how the timing of leadership behaviors is important. For example, Qin, Huang, Johnson, Hu, and Ju (2018) found that leader daily abusive behaviors increased leader work engagement the next day but that it had a negative effect on leader work engagement after several days. In general, daily studies can incorporate time into leadership research to provide further information into the short-term process of leadership.

Leadership in its natural context

Finally, daily studies of leadership often examine leadership in its natural context rather than in a special environment such as a laboratory setting. Measuring behaviors as they naturally and spontaneously occur is what makes the study of daily behaviors fundamentally different from both laboratory and field studies that use global self-reports (i.e., general experiences or stable trait-like differences between people). Gathering contextualized information is one of the major advantages of daily studies (Reis, 2012). For example, employees are often asked to rate their leader's behavior when they are at work, rather than in a lab or at home. Studying behaviors and feelings in their natural context is important because the context plays an important role in eliciting these behaviors and feelings. Additionally, feelings and emotions are transient in nature (Robinson & Clore, 2002). When your leader's behavior elicits certain feelings, these feelings may have disappeared by the time you got home, or they may have been affected by other experiences. So, the closer the measure is to the actual experience, the better.

In addition, the embeddedness of daily studies in the natural context is also relevant when studying leadership behaviors that cannot be studied in the lab for ethical or practical reasons. Due to ethical concerns, daily studies become of paramount importance for abusive leader behaviors or other types of destructive leadership behaviors. Because it would be unethical to experimentally manipulate destructive leadership behaviors such as publicly ridiculing someone or blaming someone for something (s)he did not do, these behaviors can be studied as they naturally occur during the day. In addition, from an external validity standpoint, leadership can be difficult to authentically create in a laboratory setting, which makes it uniquely important to study leadership in the field. While laboratory studies of leader behaviors can provide important insight into leadership (e.g., Koning & Van Kleef, 2015; Van Kleef et al., 2009; Visser, van Knippenberg, Van Kleef, & Wisse, 2013), an encounter with an actor, a pre-recorded video, or written description of a leader carries ecological validity limitations. For these reasons, leadership derives distinct advantages from being studied in a daily fashion.

Review process

Experience sampling methodology

Our review focuses on leadership studies that utilized experience sampling methodology (ESM) to measure daily leadership behaviors, which we refer to as “daily leadership studies.” ESM is a methodological approach that allows researchers to better capture real-time experiences (Uy, Foo, & Aguinis, 2010). That is, rather than having participants reflect back on experiences and feelings that happened in the past, ESM allows scholars to measure experiences and feelings as they occur (Fisher & To, 2012). There are three types of ESM methods (Reis & Gable, 2000; Uy et al., 2010; Wheeler & Reis, 1991). The first is collecting data at a specified interval (e.g., at the end of a workday) is called interval-contingent sampling. This method is one of the most common ways of employing ESM in leadership studies (see Barnes et al., 2015; Courtright, Gardner, Smith, McCormick, & Colbert, 2016, and Lanaj, Foulk, & Erez, 2019 for examples). It is used to study phenomena at fixed times, for example at 09:00 AM to report about one's sleep that night and at 06:00 PM to report about one's workday. Because this type of sampling introduces some type of memory bias (e.g., reflecting on the entire workday), it is best used to measure experiences and behaviors that are somewhat resistant to memory bias.

The second type of ESM invites participants to input data every time they are notified by the researchers, usually by email or through an electronic notification device (see Bono, Foldes, Vinson, & Muros, 2007 for an example). This type of sampling is called signal-contingent sampling and can be used to measure ongoing experiences that are likely affected by the predictability of measurement and memory bias. Participants are asked to report their current experiences when they receive a signal. This type of sampling is also referred to as experience sampling. The third type of ESM collects data at an event level (see Meier & Gross, 2015; Stocker et al., 2014, and Wijewardena, Härtel, & Samaratunge, 2017 for examples), and is called event-based sampling. In this type of design, participants are asked to respond to a survey every time a particular event or interaction occurs. By having participants respond immediately following the event in question, researchers can minimize recall bias. Event-based sampling is especially useful to capture rare phenomena because participants only report on their experiences when a specified event happens (Uy et al., 2010). Collectively, these three ways of conducting ESM studies give scholars a variety of ways to design their studies depending on their research questions.

Systematic review

We conducted our search for empirical leadership studies by searching in EBSCO and Web of Science. We focused our search on studies that examined leadership behaviors (i.e., transformational, ethical) – either measured by the leader or follower. To identify articles relevant to our review we searched for *leader**, *manager**, or *supervis** as well as one of the following keywords: *daily report*, *experience-sampling*, *event sampling*, *diary stud**, or *daily diary*. In our search process, we confirmed that the articles aligned with the aim of the review by 1) including leadership behaviors, 2) measuring variables at the daily level, and 3) including a dependent variable (i.e., we excluded studies that simply measured the frequency of different types of leader behaviors but did not measure a dependent variable). Through this search process, we found 72 articles. We then added two articles (Lanaj & Jennings, 2019; Liao, Liu, Li, & Song, 2018) of which we were aware, bringing our total to 74 articles. Below, in Table 1, we provide a summary of each article included in our review. We first summarize the theories and models used in the articles, then provide a synthesis of the methodological approaches used, and finally review the articles based on leadership behavior studied.

Table 1
Articles identified for review and summaries.

Authors (year)	Leadership behavior	Theoretical framework	Data source	Data collection frequency & duration	Key findings
Almeida et al. (2016)	Supportive	Work-home resource model	131 followers	Once a day for 8 days	General supportive leadership moderates the relationship between follower work-family conflict to follower negative affect. Daily supportive leadership also moderated the relation between follower work-family conflict to nighttime cortisol levels.
Amabile, Schatzel, Moneta, and Kramer (2004)	Supportive	Componential theory of creativity	139 followers	Once a day during a project lifespan (8–37 weeks)	A leader's daily behaviors affect followers' daily perceptions and feelings, which then affected peer-rated follower creativity.
Barnes et al. (2015)	Abusive	Ego depletion theory	99 leaders & 261 followers	Once a day for 10 days	A lack of quality sleep influences leaders to engage in daily abusive supervision behaviors due to ego depletion, which then leads to decreased work unit engagement.
Beattie and Griffin (2014)	Supportive	Job demands-resources theory	130 followers	Eight times over 4 weeks	Supportive leadership minimizes the positive relationship between daily incivility and daily stress.
Blanco-Donoso, Garrosa, Demerouti, and Moreno-Jiménez (2017)	Supportive	Conservation of resources theory	74 followers	Twice a day for 5 days	The authors did not find that daily supervisor support buffered the negative effect daily difficulties to regulate emotions at work had on emotional exhaustion, fatigue, and negative affect.
Bono et al. (2007)	Transformational & exchange	Self-determination theory	54 followers	Four times a day for 10 days	Follower experience fewer positive emotions when interacting with their leader. Further, followers with a leader high in transformational leadership experience more positive emotions during the day. Leader transformational leadership also moderates the daily relation between follower emotion regulation and job satisfaction but not the daily relation between follower emotion regulation and job stress.
Bormann (2017)	Ethical & abusive	Social learning theory	241 followers	Once a day for 5 days	Daily ethical leadership leads to follower engagement which then increased follower helping. Further, the mediated relationship is moderated by the previous day's abusive leadership behaviors.
Breevaart and Bakker (2018)	Transformational	Job demands-resources theory	271 followers	Once a day for 10 days	Daily challenge demands has a positive relationship with work engagement on the days that transformational leadership was high. Daily hindrance demands has a negative relationship with work engagement on days when transformational leadership was low.
Breevaart et al. (2014)	Transformational, contingent reward, & MBE	Transformational leadership theory	61 followers	Once a day for 34 days	Daily transformational leadership and contingent reward positively affects followers' daily sense of work of a favorable work environment and work engagement, while MBE decreases feelings of a favorable work environment.
Butts, Becker, and Boswell (2015)	Abusive	Affective events theory	341 followers	Once a day for 7 days	The relationship between the affective tone of electronic communication and anger is strongest when communication is from a leader and the leader is high in abusive supervision.
Christensen-Salem, Kinicki, Zhang, and Walumbwa (2018)	Supportive	Affective events theory	63 followers	Once a day for 10 days	Leader developmental feedback leads to positive affect via feedback acceptance, which then increases creativity on a within-person basis.
Courtright et al. (2016)	Abusive	Resource drain theory	92 leaders	Once a day for 10 days	Family work conflict leads to increases in abusive supervision the next day, via ego depletion.
Derkx, van Duin, Tims, and Bakker (2015)	Expectations	Boundary theory	100 followers	Once a day for 4 days	When leaders expect followers to be online after work hours, the relationship between daily smartphone use and daily work-home interference is strengthened.
Diebig, Bormann, and Rowold (2017)	Transformational	No explicit model or theory	205 followers	Once a day for 5 days	Leader transformational leadership behaviors increase team cooperation which then decreases follower stress. Type of communication moderates this relationship.

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Table 1 (continued)

Authors (year)	Leadership behavior	Theoretical framework	Data source	Data collection frequency & duration	Key findings
Dollard and Idris (2017)	Supportive	Job demands-resources theory	109 followers	Once a day for 5 days	Espoused psychological safety climate leads to daily enacted leader support, which then leads to an increase in work engagement. Espoused psychological safety climate influences the daily fluctuation of enacted leader support. Daily leader support also strengthens the negative relation between espoused psychological safety and emotional exhaustion.
Dong, Liao, Chuang, Zhou, and Campbell (2015)	Empowering	Regulatory focus theory	380 followers	Ten random work events over 4 weeks	Empowering leadership strengthens the relationship between follower state promotion focus and follower creativity. Empowering leadership also strengthens the indirect effect between customer empowering behavior to employee creativity via state promotion focus.
Ellis, Bauer, Erdogan, and Truxillo (2018)	Exchange	No explicit model or theory	129 followers	Once a day for 5 days	Leader member exchange quality increases followers' sense of belonging which then enhances their vigor and decreases their emotional exhaustion. Leader member exchange relationships also affect follower next day emotional exhaustion.
Ford et al. (2018)	Helping & justice	Affective events theory	54 followers	Once a day for 10 days	Daily leader helping leads to more episodic gratitude towards the organization, which increases the prevalence of OCBs and decreased the prevalence of CWBs. Leader interactional justice leads to a decrease in episodic anger towards the organization, which decreases the prevalence of CWBs.
Foulk, Lanaj, Tu, Erez, and Archambeau (2018)	Abusive	Social distance theory of power & Consent-based theory of power	108 leaders	Thrice a day for 10 days	Psychological power leads to leader abusive behaviors which then leads to decreases in need fulfillment and relaxation.
Germeyns and De Gieter (2017)	Supportive	Conservation of resources theory	50 followers	Once a day for 10 days	The positive relationship between daily home-work conflict and daily CWB is minimized when employees experience high levels of family-support from their leader.
Goh, Ilies, and Wilson (2015)	Supportive	Conservation of resources theory	135 followers	Twice a day for 5 days	High levels of leader support minimize the negative relationship between daily workload and daily work-family conflict.
Hetland, Hetland, Bakker, and Demerouti (2018)	Transformational	Transformational leadership theory	65 followers	Once a day for 5 days	Daily transformational leadership leads to an increase in positive job attitudes through an increase in fulfillment of psychological needs.
Hetland et al. (2018)	Transformational	Job demands-resources theory	107 followers	Once a day for 5 days	Daily transformational leadership behaviors lead to follower's daily job crafting. Promotion focus moderated this relation.
Johnson, Lanaj, and Barnes (2014)	Justice	Ego depletion theory	79 leaders	Twice a day for 10 days	Daily procedural justice behaviors are depleting for leaders and indirectly reduce leader OCB. Daily interactional justice behaviors are not depleting for leaders and indirectly increase leader OCB.
Johnson, Venus, Lanaj, Mao, and Chang (2012)	Transformational, consideration & abusive	Social identity theory	53 leaders & 86 co-workers or followers	Once a day for 15 days	Leaders with a collective identity have higher mean levels of transformational leadership behaviors and lower variance in transformational leadership behaviors. Leaders with an individual identity have higher mean levels of abusive supervision and lower variance in abusive supervision.
Jones and Johnston (2012)	Supportive	No explicit model or theory	171 followers	Once a shift for 3 shifts	Nurses who received leader support after a negative incident are more likely to have a decrease in positive affect following the negative incident.
Jones and Johnston (2013)	Supportive	No explicit model or theory	171 followers	Once a shift for 3 shifts	The authors did not find that daily leader support interacted with negative affect to influence quality of care.
Judge, Scott, and Ilies (2006)	Justice	Affective events theory	64 followers	Once a day for 15 days	On days that followers perceive their leader displayed higher levels of interpersonal justice, followers feel more job satisfaction and less state hostility
Kelloway, Weigand, McKee, and Das (2013)	Positive & transformational	Broaden & build theory	26 followers	Six times over a three-week period	Positive leadership and transformational leadership increase followers' daily positive affect.

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Table 1 (continued)

Authors (year)	Leadership behavior	Theoretical framework	Data source	Data collection frequency & duration	Key findings
Kudesia and Reina (2019)	Leader trustworthiness	No explicit model or theory	201 followers	Thrice a day for 8 days	Specific instances of interactions with trustworthy leaders were not significantly associated with within-person changes in mindfulness.
Kuonath, Specht, Kühnel, Pachler, and Frey (2017)	Transformational	Affective events theory	97 followers	Once a day for 5 days	Daily transformational leadership leads to an increase in followers' personal initiative.
Lam, Lee, and Sui (2019)	Voice reception	Social judgement theory	53 followers & 33 leaders	Every time an employee used voice towards his/her manager for 4 weeks	Voice directness was positively related to leader endorsement, but only for individuals who had high voice credibility.
Lanaj and Jennings (2019)	Helping	Affective events theory	43 leaders & their followers	Twice a day for 15 days for leaders; once a day for 15 days for followers	Leaders experienced more negative affect on days that they helped followers with personal problems. Also, followers rated their leaders as less engaged on days that they had helped them with personal problems.
Lanaj et al. (2019)	Self-reflection	Cognitive energetic theory & leader identity theory	65 leaders	Thrice a day for 10 days	Leader self-reflection behaviors decreased leader depletion which increased leader engagement. This then leads to both leader prosocial impact and clout.
Lanaj, Johnson, and Lee (2016)	Transformational, transactional	Affective events theory & self-determination theory	50 leaders (Study 1) & 47 leaders (Study 2)	Twice a day for 15 days (both studies)	Daily engagement of transformational leadership increases leader positive affect and decreases negative affect.
Lavy, Littman-Ovadia, and Boiman-Meshita (2017)	Supportive	No explicit model or theory	120 followers	Once a day for 10 days	Daily supervisor support significantly influenced the amount employees used their strengths on the following day. Daily colleague support did not significantly predict following-day use of strengths.
Li, Barnes, Yam, Guarana, and Wang (in press)	Voice reception	Ego depletion theory	62 leaders	Once a day for 10 days	Leaders are less likely to accept employee voice when they are more depleted.
Liao et al. (2018)	Abusive	Moral licensing/ cleansing theory	31 leaders and 72 followers (Study 1) & 68 leader-follower dyads (Study 2)	Twice a day for 10 days (both studies)	Daily abusive supervision leads to guilt and perceived loss of moral credits, which leads to constructive leader behavior.
*Liao et al., 2018	Exchange	Social exchange theory	73 followers	Event-based sampling over two weeks	Resource contribution surplus in an exchange episode increases state work engagement and leads to an increase in member resource contribution in the next exchange episode. High LMX relationships attenuate this effect.
Liu et al. (2015)	Supportive	Self-regulation theory	125 followers	Four times a day for 15 days	Perceived leader family support minimizes the effect of daily family-to-work conflict on displaced aggression towards leaders, coworkers, and family members.
Matta, Erol-Korkmaz, Johnson, and Biçaksız (2014)	Exchange	Affective events theory	50 followers	Once a day for 10 days	Negative daily work events are associated with followers' negative emotional reactions and subsequent CWB. Of the negative daily work events, negative interactions with supervisors generally lead to the strongest negative emotional reactions.
Matta, Scott, Colquitt, Koopman, and Passantino (2017)	Justice displays	Uncertainty management theory	97 leader-follower dyads	Once a day for 15 days	Justice variability displayed by leaders leads to more stress for followers. Justice variability also exacerbates the relationship between workplace uncertainty and stress. Leaders with more self-control show less justice variability.
Meier and Gross (2015)	Incivility	Self-control strength model	116 followers	Every time an event occurred over two weeks	Followers exhibit incivility towards their supervision in response to incivility, but only when the incivility of the leader recently occurred that day.
Myrdén and Kelloway (2015)	Transformational	Service-profit chain model	29 followers, 592 customers	Once a day for 5 days	Daily transformational leadership increases employee job satisfaction and engagement. Increases in job satisfaction and engagement subsequently positively impact customer perceptions of quality, customer satisfaction, and customer loyalty intentions.
Nielsen and Cleal (2010)	Leader daily tasks	Flow theory	58 leaders	Randomly asked to respond about 8 times per day for 10 days	Engaging in planning, problem-solving, and evaluation tasks was positively related to experiencing flow at work.

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Table 1 (continued)

Authors (year)	Leadership behavior	Theoretical framework	Data source	Data collection frequency & duration	Key findings
Nielsen and Cleal (2011)	Transformational	No explicit model or theory	58 leaders	Randomly asked to respond about 8 times per day for 10 days	Information sharing, brainstorming, planning, problem-solving, discussion, and evaluation are situations that predict transformational leadership behavior.
Pluut, Ilies, Curșeu, and Liu (2018)	Supportive	Work-home resources model	112 followers	Twice a day for 9 days	Leader support weakens the positive effect of workload on emotional exhaustion.
Qin et al. (2018)	Abusive	Conservation of resources theory	72 leaders	Twice a day for 10 days	Daily abusive supervision leads to improved recovery levels. However, these benefits are only short-lived.
Rodríguez-Carvajal, Herrero, van Dierendonck, de Rivas, and Moreno-Jiménez (2019)	Servant	Broaden & build theory	126 followers	Thrice a day for 5 days	Daily servant leadership led to an increase in next-day worker goal attainment through helping employees feel more positive about the meaning of life and by helping increase their vitality the next morning.
Rosen et al. (2019)	Transformational & initiating structure	Self-regulation Theory	48 leaders	Twice a day for 10 days	Leaders' daily email demands negatively affect goal progress. For leaders with low self-control, a decrease in goal progress then leads to a decrease in transformational and structure initiating behaviors.
Schilpzand, Houston III, and Cho (2018)	Empowering	Model of proactive motivation	98 followers	Twice a day for 10 days	Daily empowering leadership leads followers to have enhanced next day proactive behaviors of voice and risk-taking. Follower sleep quality moderates this effect.
Scott, Colquitt, Paddock, and Judge (2010)	Empathy	Appraisal theory of emotions	60 followers	Once a day for 10 days	Groups with managers who expressed empathy experienced lower average levels of somatic complaints, and their daily progress was more positively related to positive affect.
Scott, Garza, Conlon, and Kim (2014)	Justice	Justice theory	90 leaders	Once a day for 15 days	On a day-to-day basis, leaders adhere to justice norms both due to cognitive and affective motives.
Sherf, Venkataramani, and Gajendran (2019)	Justice	Self-regulation theory	107 leaders	Twice a day for 10 days	When leaders face high workloads, they are more likely to prioritize technical responsibilities over acting justly.
Shockley and Allen (2013)	Supportive	Theory of optimal matching	58 followers	Four times a day for 10 days	The positive relationship between family interference with work conflict and blood pressure is minimized by family-supportive leaders.
Stocker et al. (2014)	Supportive	No explicit model or theory	139 followers	Event-based sampling for 5 days	On days that leaders showed appreciation for followers, followers experienced higher levels of serenity.
Tariq and Ding (2018)	Abusive	Self-determination theory	320 followers	Once a day for 10 days	Abusive supervision negatively affects job performance and positively impacts turnover intentions through a decrease in intrinsic motivation. These effects are lessened when family motivation is high.
Tepper et al. (2018)	Transformational	P-E Fit	65 followers (Study 1); 109 followers (Study 2)	Once a day for 15 days (both studies)	The daily fit between transformational needed and received leads to follower positive affect. This increase in positive affect then leads to higher levels of job satisfaction, satisfaction with leader, and OCBs.
To, Fisher, Ashkanasy, and Rowe (2012)	Supportive	Dual-pathway model	30 followers	Thrice a day for 10 days	The relationship between positive mood and creative process engagement is stronger when leader support for creativity is high.
Tims et al. (2011)	Transformational	Job demands-resources theory	42 followers	Once a day for 5 days	Daily transformational leadership increases followers' daily work engagement by increasing their levels of optimism.
Tompprou and Nikolaou (2013)	Extending promises	Psychological contract theory	85 followers	Once a day for 10 days	Promises made by line managers had more of an effect on newcomers' beliefs in employer's promises compared to promises made by HR managers and promises made by top management.
Tsai and Chen (2017)	Supportive	Personal resource depletion theory	67 followers	Every time the employee had an interaction with a customer	The negative relationship between customer negative affective displays and employee positive affective displays was minimized by perceived supervisory support.
Van Dijke, Leunissen, Wildschut, and Sedikides (2019)	Justice	Self memory system model	128 followers (Study 1); 311 followers (Study 2)	Once a day for 10 days (Study 1); Once a day for 5 days (Study 2)	The positive effect between nostalgia and both intrinsic motivation and work effort is strongest in situation of low interactional justice from leaders.

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Table 1 (continued)

Authors (year)	Leadership behavior	Theoretical framework	Data source	Data collection frequency & duration	Key findings
Venus, Johnson, Zhang, Wang, and Lanaj (2018)	Vision communication	Construal level theory	44 leaders	Twice a day for 15 days	Leader construal level in the morning positively affected leader vision communication during the day, but only for leaders whose leadership self-identity was high.
Vogel and Mitchell (2017)	Abusive supervision	Self-defense view & self-presentational view	73 followers	Once a day for 15–21 days	Daily abusive supervision leads to a decrease in follower self-esteem, which leads to an increase in follower workplace deviance and self-presentational behaviors. The negative relationship between daily abusive supervision and follower daily self-esteem is stronger when turnover intentions are low.
Volmer (2015)	Exchange	Affective events theory	98 followers	Thrice a day for 5 days	Daily social conflict between followers and leaders leads to increases in negative affect for followers before they go to bed. Between-level effects of both core self-evaluations and procedural justice perceptions moderate this relationship.
Weiss, Razinskas, Backmann, and Hoegl (2018)	Authentic	Ego depletion theory	44 leaders	Once a day for 10 days	Authentic leadership decreases leaders' stress and increases their work engagement and the effects are mediated by leader mental depletion.
Wijewardena et al. (2017)	LMX	Affective events theory & comprehension-elaboration theory	889 followers	Every time an event occurred over 10 days	Follower's perceptions of leader humor behaviors impact followers' emotions. When followers perceive their leader's humor to be positive, they often experience an increase in positive emotions. When followers perceive their leader's humor to be negative, they often experience an increase in negative emotions.
Xanthopoulou, Dakker, Demerouti, and Schaufeli (2012)	Coaching	Broaden & build theory	42 followers	Once a day for 5 days	Day-level coaching increases follower positive emotions and personal resources for that day.
Yagil and Medler-Liraz (2014)	Authentic	No explicit model or theory	76 followers	Once a day for 10 days	The relationship between followers' positive emotions and their authentic self-expression is stronger if they have leaders who engage in authentic leadership behaviors.
Yang and Diefendorff (2009)	Justice	Affective events theory	231 followers	Once a day for 25 days	Perceived leader interpersonal justice behaviors increase follower negative emotions and lead to follower counterproductive work behaviors.
Yeung and Shen (2019)	Abusive, consideration, and structure initiating	Affective events theory	103 leaders	Once a day for 10 days	Daily authentic pride leads to more use of initiating structure and consideration. Daily hubristic pride leads to more abusive supervision.
Zacher (2016)	Mentoring	Career construction theory	159 followers	Once a day for 5 days	Daily leader career mentoring was negatively associated with follower daily concern and positively associated with follower daily curiosity.
Zacher and Wilden (2014)	Ambidextrous	Ambidexterity Theory	113 followers	Once a day for 5 days	On days that leaders use ambidextrous leadership, followers are more innovative.

Review of theoretical approaches

Key to effective leadership research is using theory to develop arguments. Whereas the leadership field has been criticized for its lack of solid leadership theories (e.g., Van Knippenberg & Sitkin, 2013), several different theoretical perspectives have been adopted to understand the causes and consequences of daily leadership. Most studies identified in our review utilized an overall model or theoretical framework to build their arguments (66/74 articles - 89%), but there was a portion of articles that failed to use an overarching theoretical framework to guide their arguments (8/74 articles - 11%). We identified three dominant types of theoretical perspectives to explain the daily causes and consequences of leadership, namely stressor/strain theories (e.g., job demands-resource theory, conservation of resources theory, ego depletion theory; 18/66 articles - 27%), affect/emotion theories (e.g., affective events theory, broaden-and-build theory; 16/66 articles - 24%), and motivation theories (e.g., self-determination theory; 12/66 articles - 18%). In total, these three types of theoretical perspectives made up 70% all the studies in our review that relied upon theory and 62% of all the articles in our review. In addition to these three types of theoretical perspectives, seven articles used social theories (e.g., social learning theory), six articles used cognitive theories (e.g., cognitive energetic theory), and three used leadership theories (e.g., leader identity theory). The other articles used a variety of other theoretical perspectives such as justice theory, psychological contracts theory, etc. **Table 1** reports the theory or model used by each study, and **Table 2** summarizes the theoretical perspectives used in daily leadership research.

Table 2
Theoretical perspectives.

Theory	Number of studies
Affective events theory	12
Job demands-resource theory	5
Conservation of resources theory	4
Ego depletion theory	4
Broaden and build theory	3
Self-determination theory	3
Self-regulation theory	3
Transformational leadership theory	2
Work-home resource model	2
Ambidexterity theory	1
Appraisal theory of emotions	1
Boundary theory	1
Career construction theory	1
Cognitive energetic theory	1
Componential theory of creativity	1
Comprehension-elaboration theory	1
Consent-based theory of power	1
Construal level theory	1
Dual-pathway model	1
Flow theory	1
Justice theory	1
Leader identity theory	1
Model of proactive motivation	1
Moral licensing theory	1
P-E fit theory	1
Personal resource depletion theory	1
Psychological contract theory	1
Regulatory focus theory	1
Resource drain theory	1
Self-control strength model	1
Self-defense and self-preservation view	1
Self-memory system model	1
Service-profit chain model	1
Social distance theory of power	1
Social exchange theory	1
Social identity theory	1
Social judgement theory	1
Social learning theory	1
Theory of optimal matching	1
Uncertainty management theory	1

Importantly, not all leadership research is appropriate for daily study. Studies that look at long term changes in leadership or stable relations are not well suited for daily studies. However, during our review process, we were pleased to observe that the majority of articles did use daily leadership studies to answer questions that could not have been answered as effectively using other methods. Many studies looked at the antecedents or outcomes of short-term factors, which are the types of things best studied for daily ESM studies. Also, many studies used stressor/strain theories or affect/emotion theories as their overall theoretical perspective. The studies of specific stressors, affect, and emotions related to leadership are the types of theoretical questions that are well suited to be examined in a daily fashion because they can be short-lived.

Review of methodological approaches

While prior research has already provided advice on how to conduct general (e.g., Gabriel et al., 2018) and leadership-specific (e.g., Ohly & Gochmann, 2017) ESM studies, we highlight the methodological practices currently employed by researchers who study the daily leadership practice. By summarizing common methodological practices, we hope to show patterns, strengths, and weaknesses in current methodological designs. Because there is diversity in the methodological practices used in existing research, we discuss the articles by data sources, response rates, and study designs. **Table 3** gives a summary of the study methods and study designs used by the articles in our review.

Data source

Of the samples included in our review, a majority of them used data only from followers (54 of 78 samples – 69%), some used only leader report data (16 of 78 samples – 21%), and a small number of samples used data from both leaders and followers (8 of 78 samples – 10%). One study used both follower and customer data (Myrdén & Kelloway, 2015). Both follower and leader reports used to explore the daily relations of leadership are valid and useful. Yet, it is important to note that a majority of our information about the daily aspects of leadership are from follower perceptions. The studies that did include leaders in their samples typically did not specify the type or level of leader measured. This is unfortunate because a leader's level within the organization has important implications for understanding leadership and

Table 3
Summary of methods and study designs.

	Type of daily ESM study			
	Interval-contingent	Signal-contingent	Event-based	Overall
Total number of samples	67	5	6	78
Times measured per day				
Once a day	44	3	–	47
Twice a day	14	–	–	14
Thrice a day	6	–	–	6
Four or more times	3	2	–	5
Length of study (in workdays)				
3–5 days	19	1	2	22
6–10 days	33	4	3	40
11 or more days	15	–	1	16
Data source				
Follower	47	3	5	54
Leader	14	2	–	16
Both	6	–	1	8

Note: the total number of samples is greater than the total number of articles reviewed because several articles had more than one sample.

should be included in future research. Finally, most studies relied upon a single source for their data collection (i.e., either only leaders or only followers). Of course, collecting multiple measures from multiple participants at multiple points in time can be challenging. But study designs that do collect data from multiple sources overcome issues of common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This is important because ESM study designs do not overcome the weaknesses of common method bias in and of themselves (Gabriel et al., 2018).

Response rates and inclusion criteria

While response rates varied across studies, most studies got response rates between 70 and 90%. Before analyzing the data, some studies excluded data from participants who completed less than 20% (e.g., Barnes et al., 2015), 50% (e.g., Breevaart & Bakker, 2018), or 80% (e.g., Courtright et al., 2016; Judge et al., 2006) of the surveys. Also, responses were excluded for participants who responded when not at work (e.g., Bono et al., 2007), responded outside of the specified time frame (e.g., Courtright et al., 2016) or when data was not available for both the leader and follower. Finally, some studies had missing data because participants were instructed to report the number of interactions they had with their leader on a day and responses were excluded when participants did not interact with their leader during the day (e.g., Liao et al., 2018; Meier & Gross, 2015). However, even though most articles had to deal with a substantial amount of missing data due to the nature of ESM studies, almost no articles mentioned the use of modern missing data techniques (Enders, 2010; Graham, 2009; Newman, 2014). We hope future daily leadership studies will better utilize these missing data techniques.

Type of daily ESM study

Interval-contingent

Most samples in our review used interval-contingent sampling, with 67 of 78 (86%) using this sampling method. Of these samples, 44 of 67 collected measures once a day, 14 of 69 collected measures twice a day, 6 of 69 collected measures thrice a day, and 3 collected measures four or more times a day. Collecting data once a day for a day-to-day study design, such as exploring how previous day factors affects next day leader behavior (e.g., Courtright et al., 2016), temporally separates independent from dependent variables and reduces common-method bias. Yet, several studies in our review not only used single-source data, but also collected their independent and dependent variables at the same time. Scholars that explore the daily aspects of leadership using an interval-contingent sampling design benefit by having temporal separation between their independent and dependent variables, particularly when they are collecting all their data from a single source. Future research should temporally separate independent and dependent variables where possible. Many interval-contingent samples also fail to capitalize on measuring leadership relationship in their natural context by having participant's complete measure at home, or after work.

The number of days included in interval-contingent samples ranged from three days to over a month. Of the samples in our review, 19 of 67 (28%) measured responses for 3–5 days, 33 of 67 (49%) measured responses for 6–10 days, and 15 of 67 (22%) measured responses for 11 or more days. Prior research on ESM study designs has recommended measuring participants for at least 10 days (Gabriel et al., 2018; Ohly & Gochmann, 2017). Therefore, future leadership researchers should do better at following this best practice or explain why they deviate from this recommendation.

Signal-contingent

Only six samples used a signal-contingent study design. Two studies relied upon leader reports, and three relied upon follower reports. Three studies collected measures once per day, and two studies

collected measures four or more times a day. One study collected data for 3–5 days, and the other four studies collected data for 6–10 days. These studies followed best practice.

Event-based

Six samples used event-based sampling. Five of the samples used follower-reported data and one sample used both leader- and follower-reported data. Two samples lasted 3–5 days, three lasted 6–10 days, and one lasted 11 or more days. The number of times participants responded per day depended upon the number of times the event being measured occurred each day. This study design allows researchers to get as proximal to leader behaviors or follower outcomes as possible because participants respond right after the event being studied occurs. Based on the current state of the science, these relations are less studied. In addition, this type of study design fully captures the benefit of daily studies of capturing "life as it is lived" (Bolger et al., 2003) by measuring leadership relations in their natural context and as close to their occurrence as possible. We hope future research will utilize this study design more often.

Review of leader behaviors

We review the literature on daily leadership research by discussing the findings organized by leadership behavior (e.g., transformational, abusive). The sections on each behavior are organized by 1) a summary of methods and theories used for the leader behavior, 2) a summary of the direct and indirect consequences of the daily leader behavior, 3) a summary of the causes (i.e., antecedents) of the daily leadership behavior, and 4) a summary of the leader behavior as a moderator between daily relations.

Daily transformational leadership behaviors

Methods and theory

We found 16 articles that explored the daily aspects of transformational leader behaviors and the sub-facets of transformational leadership (e.g., vision communication). Out of the 16 articles that we found, 13 used interval contingent sampling and 1 used signal-contingent sampling (Nielsen & Cleal, 2011). In addition, the samples of ten studies consisted of only followers, the samples of three studies only included leaders, two studies included both leaders and followers, and one study included both followers and their customers (Myrden & Kelloway, 2015). Finally, a range of different theories were used to study daily transformational leadership, the most frequently used being job demands-resources theory, transformational leadership theory, and self-determination theory.

Consequences

Eleven out of sixteen articles in our review explored the daily consequences of leader transformational behaviors for followers and the leaders themselves, showing that daily transformational leadership behaviors have positive, proximal consequences for both. First, daily transformational leadership behaviors have been found to increase followers' state job engagement on a daily basis via an increase in followers' optimism (e.g., Tims et al., 2011), autonomy, or social support (e.g., Breevaart et al., 2014). In addition to job engagement, on days that leaders show more transformational leadership, followers engage in more job crafting behaviors (Hetzler et al., 2018), experience more positive affect (Kelloway et al., 2013), have an increase in positive job attitudes (Hetzler et al., 2015; Myrden & Kelloway, 2015), display more personal initiative (Kuonath et al., 2017), and are more likely to cooperate with their team members (Diebig et al., 2017). Followers also report more daily positive emotions when they rate their leader as transformational (Bono et al., 2007). Work by Tepper et al. (2018) found that daily transformational leader behaviors increase follower state positive affect and job satisfaction, but only when followers feel a

need for transformational leadership. In addition to the daily consequences of transformational leadership for followers, [Lanaj et al. \(2016\)](#) found that daily transformational leader behaviors increased the leaders' own state positive affect and decreased their state negative affect.

Causes

Our review identified four daily studies that highlighted the proximal antecedents of daily transformational leadership behavior. Two of these studies show that daily job demands and characteristics affect leaders' daily use of transformational behavior. Daily email demands were found to reduce leaders' daily transformational behaviors via goal progress ([Rosen et al., 2019](#)), while situational factors like planning, problem-solving, and brainstorming were found to lead to increases in day-to-day use of transformational leader behaviors ([Nielsen & Cleal, 2011](#)). Both of these articles are great examples of articles measuring specific variables that would be difficult to capture without using ESM.

From a frequency perspective, [Johnson et al. \(2012\)](#) found that individuals with a high collective (as opposed to individual) identity displayed higher mean levels of transformational leadership behaviors and less daily variation in their transformational leadership behaviors. Finally, [Venus, Johnson, Zhang, Wang, and Lanaj \(2018\)](#) explored proximal antecedents to a specific component of transformational leader behavior – vision communication. They found that when a leader's construal level (i.e., the extent to which an individual focuses on the big picture rather than the details) is high in the morning, leaders engage in more vision communication behaviors later in the day. Taken together, the daily demands, tasks, and perspectives of a leader affect when a leader engages in daily transformational leadership behaviors.

Moderators

[Breevaart and Bakker \(2018\)](#) found that daily transformational leadership enhances the positive effects of daily cognitive and workload demands onto followers' daily work engagement and reduces the negative effect between daily role-conflict and followers' work engagement. Thus, daily transformational leader behaviors can enhance the positive effects of followers' daily challenge demands and reduce the negative effects of daily hindrances. Relatedly, [Bono et al. \(2007\)](#) found that the negative daily relation between follower emotion regulation and daily job satisfaction was buffered by transformational leadership.

Daily transactional leadership behaviors and initiating structure

Methods and theory

We found six studies on daily transactional leadership, almost all of which ($k = 5$) used interval contingent sampling. Half of the studies ($k = 3$) included only followers, whereas the other half ($k = 3$) gathered data just from the leaders. In the studies, different theories were used, ranging from boundary theory ([Derks et al., 2015](#)) to affective events theory ([Yeung & Shen, 2019](#)) to psychological contract theory ([Tompprou & Nikolaou, 2013](#)).

Consequences

Two out of six articles explored the proximal consequences of leader transactional and initiating structure behaviors. Like transformational leader behaviors, the daily use of contingent reward behavior was found to be indirectly and positively related to followers' daily work engagement via both autonomy and social support ([Breevaart et al., 2014](#)). However, daily active management by exception was found to be negatively related to follower engagement via decreases in daily autonomy ([Breevaart et al., 2014](#)). Furthermore, [Tompprou and Nikolaou \(2013\)](#) showed that daily newcomer beliefs in promises made by people within their organization were higher when these promises were made by their line managers compared to HR managers and top management.

Causes

Three studies looked at proximal antecedents to daily transactional and initiating structure behaviors. [Yeung and Shen \(2019\)](#) found leader authentic pride to be associated with more structure initiating and consideration behaviors. [Rosen et al. \(2019\)](#) found that for leaders low in self-control, daily email demands led to decreases in leader structure initiating behaviors through a decrease in goal progress. Finally, [Nielsen and Cleal \(2010\)](#) showed that the more leaders engaged in daily planning, problem-solving, and evaluation of tasks, the more flow they experienced at work.

Moderators

Finally, one study examined a transactional leader behavior as a moderator between follower daily behaviors. [Derks et al. \(2015\)](#) found that when leaders expect followers to be online after work hours, the positive relation between followers' daily smartphone use and daily work-home interference is strengthened.

Daily abusive leadership behaviors

Methods and theory

Overall, we found twelve studies on daily abusive behaviors, including leader incivility. Most used interval contingent sampling ($k = 11$), and one study ([Meier & Gross, 2015](#)) used event-contingent sampling. Five studies focused solely on followers, whereas three studies focused on the leaders and three studies focused on both leaders and followers. Most studies built on affect or emotion theories, such as affective events theory (e.g., [Butts et al., 2015](#)), or stressor strain theories, such as ego-depletion (e.g., [Barnes et al., 2015](#)) and conservations of resources theory (e.g., [Qin et al., 2018](#)). Compared to other leader behaviors, daily studies on abusive leader behaviors have tended to draw from similar types of theoretical perspectives.

Consequences

Seven studies looked at the daily consequences of leader abusive behaviors. First, [Vogel and Mitchell \(2017\)](#) showed that daily abusive leadership behaviors lead to an increase in followers' daily workplace deviance due to a daily loss of self-esteem. Daily abusive leader behavior has also been found to decrease followers' daily intrinsic motivation ([Tariq & Ding, 2018](#)) and daily work engagement ([Barnes et al., 2015](#)) and increase followers' turnover intentions ([Tariq & Ding, 2018](#)). In addition, followers often exhibit incivility towards their leaders in response to incivility they experienced that day ([Meier & Gross, 2015](#)).

The daily use of abusive leader behaviors also has consequences for the leaders themselves. Interestingly, engaging in abusive leader behaviors in the morning causes leaders to experience guilt and a sense of lost moral credits, and as a result, leaders are more likely to engage in constructive leader behaviors in the afternoon ([Liao et al., 2018](#)). Abusive leader behaviors during the day have also been found to result in decreased need fulfillment and relaxation at the end of the day ([Foulk et al., 2018](#)). In contrast, research has found that abusive leader behaviors during the day can lead to enhanced recovery at the end of the day due to leader resource conservation and leads to next day leader work engagement ([Qin et al., 2018](#)). However, the recovery effects due to abusive leader behaviors seem to be short-lived, and engaging in these abusive behaviors has a negative effect on leaders' work engagement after several days. Taken together, these findings suggest that additional future work is needed to synthesize the conflicting personal consequences of leader abusive behaviors on the leaders themselves.

Causes

Five studies explored the short-term daily antecedents to abusive leader behaviors. Specifically, it has been found that a leader's previous night's sleep quality ([Barnes et al., 2015](#)) and previous day's level of family-to-work conflict ([Courtright et al., 2016](#)) increase the leader's depletion of ego resources, which leads to more abusive leader

behaviors the next day. Also, Johnson et al. (2012) found that leaders with an individual (vs. collective) identity showed higher daily mean levels of abusive supervision and less variation in their abusive supervision behaviors. Other studies highlight how daily feelings of psychological power can increase daily abusive behaviors (Foulk et al., 2018), and how leader pride can also be a source of daily abusive leader behaviors (Yeung & Shen, 2019). Thus, both pre-work factors, such as sleep quality and family interaction, and a leader's psychological and emotional state are important antecedents of daily abusive behaviors.

Moderators

Finally, two studies explored abusive leader behaviors as a moderator. One study found that followers were more likely to experience daily anger after receiving a negatively toned message when it came from a leader (versus coworker) who was high in abusive behaviors (Butts et al., 2015). Bormann (2017) found that previous day abusive supervision moderates the relation between ethical leadership and follower engagement. The work by Bormann (2017) is an excellent example of a within-person study that challenges how we view leadership by showing that leaders may be abusive one day but ethical another. It is also a good example of showing how two types of leader behaviors interact with each other on a day-to-day basis.

Daily leader justice behaviors

Methods and theory

Eight studies focused on daily justice behaviors of leaders, exploring both the causes and the consequences of daily justice behaviors. Leader justice behaviors include behaving equitably, fairly, and without bias. All of these articles used interval contingent sampling. Affective events theory was used most often (e.g., Ford et al., 2018; Judge et al., 2006; Yang & Diefendorff, 2009). Justice (Scott et al., 2014) and motivation theories (Sherf et al., 2019) were used as well.

Consequences

Five studies explored the daily consequences of leader justice behaviors. When followers perceive that their leaders exhibit low levels of justice on a given day, this leads to increases in follower daily negative emotions, which then increases followers' likelihood to engage in CWBs (Yang & Diefendorff, 2009). Also, followers feel more job satisfaction and less hostility on days that their leader displays more interpersonal justice (Judge et al., 2006). Similarly, followers experience less anger when their leader behaves with interactional justice, which then indirectly reduces follower daily CWB (Ford et al., 2018). And leaders that vary in their justice behaviors from day to day increase followers' daily stress which increases followers' daily job dissatisfaction and daily emotional exhaustion (Matta et al., 2017). With regard to the consequences for leaders themselves, research has found that daily procedural justice behaviors are draining for leaders but that daily interactional justice behaviors are replenishing for leaders; both indirectly affect leader OCB (Johnson et al., 2014).

Causes

Two studies have looked at the causes of daily leader justice behaviors. Leaders' daily cognitive motives of compliance, identity maintenance, and fairness, and their affective motives of positive and negative affect all were found to influence their daily practice of justice behaviors (Scott et al., 2014). Sherf et al. (2019) showed that leaders' daily workload induces leaders to prioritize technical tasks over justice behaviors, which decreases their daily behaviors of justice rule adherence (i.e., the manner in which individuals adhere to rules of justice such as explaining decisions, providing logic for decisions, or seeking input). The study by Sherf et al. (2019) is an excellent example of a daily leadership study exploring the short-term process of leadership using specific variables that would have been difficult to study in another way.

Moderators

Finally, one study explored leader justice behaviors as a moderator. High levels of daily leader displays of interactional justice were found to minimize the positive effects between nostalgia and both daily intrinsic motivation and daily work effort (Van Dijke et al., 2019). Thus, interactional justice can act as a compensatory mechanism for employees that feel low levels of nostalgia. The research on leader daily justice behaviors mirrors several findings identified in the abusive leadership section – work characteristics are important antecedents and follower negative affective reactions are key outcomes. This is not surprising, given that followers of abusive supervisors often feel unjustly treated.

Daily leader-follower interactions

Methods and theory

Daily leadership studies on leader-member exchange and other types of dyadic interactions between leaders and followers highlight how leader-follower interaction at the daily level has short-term consequences for both leaders and followers. We found nine articles that studied daily leader-follower interactions. Seven used only follower measures and one used leader and follower measures. Five of these studies are interval-contingent sampling studies, three studies used event-based sampling, and one study used a signal-contingent method. Almost all studies used affect/emotion theories (e.g., Wijewardena et al., 2017) or social theories (*Liao et al., 2018) as their theoretical framework.

Consequences

Eight studies focused on the consequences of leader-follower interactions. First, there are emotional and affective consequences for followers when they interact with their leader daily. For example, conflict episodes during the day with one's leader have been found to increase followers' daily negative affect (Volmer, 2015). Also, daily interactions with one's leader have been found to lead to fewer positive emotions than daily interactions with one's co-workers (Bono et al., 2007), and negative work events involving one's leader create higher levels of follower negative emotions compared to negative events involving co-workers (Matta et al., 2014). Finally, an event study of leader humor behaviors found that positive leader humor increased positive emotions among followers, while negative leader humor increased negative emotions among followers (Wijewardena et al., 2017). Daily leader-follower interactions have also been found to enhance follower belongingness, which enhances follower vigor and decrease emotional exhaustion (Ellis et al., 2018). And leader-follower interactions studied at the event-level show that resource contribution surplus leads to feelings of reciprocity and subsequent enhanced levels of work engagement (*Liao et al., 2018). However, Kudesia and Reina (2019) did not find daily interactions with trustworthy leaders to be significantly related to within-person changes in follower mindfulness. Finally, Li et al. (in press) found that leaders are less likely to accept employee voice when they are more depleted.

Causes

Only one study looked at the causes of leader-behavior interaction. Lam et al. (2019) found that for followers, daily voice directness was positively related to leader endorsement behavior, but only for individuals who had high voice credibility.

Daily leader supportive behaviors

Methods and theory

Overall, we found 23 daily studies on supportive supervision, which made it the most studied leader behavior in our review. These studies measured both general leader support as well as specific types of leader support such as coaching, mentoring, helping, family support, support

for creativity, etc. Most used interval-contingent methodology, and two studies used event-sampling methodology. All but two of the studies only collected data from followers, and those studies collected data from both followers and leaders. These studies used a variety of theoretical perspectives such as affective events theory ($k = 3$), conservations of resources theory ($k = 3$), work-home resource perspective ($k = 2$), and job demands-resources theory ($k = 2$). However, five of these studies did not use an overall theoretical perspective.

Consequences

In our review, 12 studies explored the follower and leader consequences of supportive behaviors. Most studies explored follower affective consequences to leader daily support. For example, Amabile et al. (2004) found that daily leader-reported supportive behaviors positively affected followers' daily perceptions of leader support and created a beneficial affective reaction for followers, which then positively affected their day-to-day creativity levels. The daily use of empathy by one's leader was found to decrease followers' daily somatic complaints and strengthen the relation between followers' daily goal progress and their state positive affect (Scott et al., 2010). Research also found that leader developmental feedback leads to follower positive affect, which then increases follower creativity on a within-person basis (Christensen-Salem et al., 2018).

Ford et al. (2018) found that daily leader helping led to more episodic gratitude towards the organization, which increased the prevalence of OCBs and decreased the prevalence of CWBs. Also, day-level coaching has been found to increase positive emotions and personal resources for followers who receive the coaching (Xanthopoulou et al., 2012). And Stocker et al. (2014) found that followers experienced higher levels of serenity on days that leaders showed appreciation for followers. Taken together, these results show that daily leader support tends to enhance follower daily affect.

However, in contrast to this general finding, two studies found that daily leader support hurt or had no effect on follower affect. Jones and Johnston (2012) found that nurses who received managerial support after a negative incident were more likely to have a decrease in positive affect. And daily supervisor support was found to not interact with negative affect to influence perceived quality of care (Jones & Johnston, 2013).

In addition to affective reactions, daily leader support can cause followers to be more effective and creative. For example, daily supervisor support can stimulate followers to use their strengths more on the following day (Lavy et al., 2017). Also, daily supervisory career mentoring was found to be negatively associated with daily concern and positively associated with daily curiosity (Zacher, 2016). Finally, research has found that on days leaders both stimulate follower's exploration of ideas and facilitate the exploitation of ideas (i.e., use ambidextrous leadership), followers display more innovative behavior (Zacher & Wilden, 2014). The general trend across these studies highlights how leaders' daily supportive behaviors tend to increase followers' daily positive affect and followers' daily creativity/innovation.

Leader supportive behaviors also have consequences for the leader. Lanaj and Jennings (2019) found that leaders experienced more negative affect on days that they helped followers with personal problems. They also found that followers rated their leaders as less engaged on days that they had helped them with personal problems. This study by Lanaj and Jennings (2019) explored an interesting within-person relation, showing a potential dark side to leader support. This likely would have been difficult to show at a between-person level of analysis.

Causes

Only one study looked at the antecedents of supportive leader behaviors. Dollard and Idris (2017) found that espoused psychological safety climate by the organization led to an increase in daily enacted leader support.

Moderators

In addition to exploring daily consequences, 11 studies looked at leader support as a moderator for various daily relations. For example, one study found that daily leader social support often weakens the positive relation between follower daily workload and emotional exhaustion (Pluut et al., 2018). Daily supportive leadership also buffers the relation between follower work-family conflict and follower end-of-day cortisol levels (Almeida et al., 2016). Daily leader support also strengthens the negative relation between espoused psychological safety and daily emotional exhaustion (Dollard & Idris, 2017). However, Blanco-Donoso et al. (2017) did not find that daily supervisor support buffers the negative effect that daily difficulties to regulate emotions at work had on emotional exhaustion, fatigue, and negative affect.

Several studies have shown how general supportive supervision moderates several types of daily work and home conflicts. For example, To et al. (2012) found that the daily positive relation between positive mood and creative process engagement is stronger when general leader support for creativity is high. General supportive supervision also minimizes the effects of daily work-to-family conflict to follower negative affect (Almeida et al., 2016); it reduces the positive effect daily family-to-work conflict has on follower daily counterproductive work behavior (Germeyns & De Gieter, 2017), aggression towards supervisors and co-workers (Liu et al., 2015), and blood pressure (Shockley & Allen, 2013); and it reduces the effect between follower daily workload and work-family conflict (Goh et al., 2015). Leader supportive behavior also reduces the relation between follower experiences of daily incivility and daily stress (Beattie & Griffin, 2014), as well as the relation between negative customer experiences on employee positive affect (Tsai & Chen, 2017). In aggregate, these studies provide considerable evidence that supportive leader behaviors can reduce the effects of follower daily negative workplace stressors.

Daily moral leader behaviors

Methods and theory

Moral approaches to leadership in this review include the following three types of leadership: servant leadership, authentic leadership, and ethical leadership (Hoch, Bommer, Dulebohn, & Wu, 2018; Lemoine, Hartnell, & Leroy, 2019). Each of these leadership theories taps into moral motifs of leader actions. We identified four studies that explored the daily occurrence and consequences of moral leadership behaviors. All but one focused on follower perceptions, and all used interval-contingent sampling methodology.

Consequences

Three studies explored the consequences of leader moral behaviors. Daily ethical leadership was found to enhance follower daily engagement and subsequent helping behavior later in the day (Bormann, 2017). However, the positive effects of daily ethical leadership behaviors onto followers' work engagement are attenuated by the leader's previous day abusive behavior (Bormann, 2017). Daily servant leadership has been found to lead to an increase in next-day follower goal attainment (Rodríguez-Carvajal et al., 2019). Moral leader behaviors also have consequences of the leader. One study found that daily authentic leadership behaviors do not deplete leaders' ego resources but enhance leaders' work engagement and decrease leaders' stress levels (Weiss et al., 2018). Thus, moral leader behaviors can be energizing for leaders as well.

Moderators

Finally, one study explored moral leadership as a moderator. Yagil and Medler-Liraz (2014) found that the relation between followers' daily positive emotions and their levels of authentic self-expression is stronger when they have a leader who displays more authentic leadership behaviors.

Surprisingly, only one study identified in our review explored daily servant leadership behaviors (Rodríguez-Carvajal et al., 2019). This is unfortunate given that servant leadership, as a general behavior pattern, predicts more variance above and beyond transformational leadership than both ethical and authentic leadership (Hoch et al., 2018).

Daily empowering leadership behaviors

Methods and theory

Empowering leadership is an emerging leadership theory and includes leader behaviors such as involving followers in decisions, delegating responsibilities to followers, and encouraging followers to take initiative (Zhang & Bartol, 2010). Only two studies examined how empowering leadership as rated by followers can affect followers' daily outcomes. One study used interval-contingent sampling with two measurement points a day (Schilpzand et al., 2018), and one study used event-sampling study (Dong et al., 2015).

Consequences

First, Schilpzand et al. (2018) showed that daily empowering leadership led followers to engage in more proactive goal setting the next day, which consequently enhanced followers' daily voice and risk-taking behaviors. These relations were strengthened when followers had a good night rest (Schilpzand et al., 2018).

Moderators

The second study found that general empowering leadership was a cross-level moderator that strengthens the relation between follower state promotion focus and creativity; empowering leadership also moderated the indirect effect between customer empowering behavior to creativity via state promotion focus (Dong et al., 2015). Thus, empowering leader behaviors can help facilitate follower daily proactivity and daily creativity.

Leader intervention

Finally, two studies explored a daily leader behavioral intervention. In an experimental ESM study, Lanaj et al. (2019) showed that on days when leaders engaged in a positive self-reflection exercise, they reported less energy depletion, which led to heightened work engagement for the leader and an increased sense of clout (perceptions of self-confidence and authority) and prosocial impact on others. This study suggests that positive self-reflection behaviors can be an important mechanism to assist leaders in their day-to-day leadership. Foulk et al. (2018) also conducted an experimental ESM study and manipulated leader psychological power. Psychological power was found to increase leader abusive behaviors.

Discussion

The number of daily studies that incorporate leadership has seen a rapid increase in the past few years. Recent scholarly work on daily leadership behaviors has not only increased our collective knowledge of leadership but has also opened up opportunities avenues for new research. Based on our discussion of the importance of studying daily leadership and review of the literature, we now provide recommendations for future research. Drawing upon our review we suggest ways scholars can provide more depth and breadth with daily leadership studies. In Table 4, we provide a summary of our recommendations for future research.

Depth

Time

An important avenue for the future is to incorporate time when studying daily leadership. Very few studies in our review explicitly

addressed time in their theorizing. This is unfortunate because time is an important element in leadership that is too often overlooked (Castillo & Trinh, 2018; Shamir, 2011). Further, an important advantage to daily studies is their ability to explain short-term processes in leadership. And time is an important boundary condition for many of the theories used to understand leadership at the daily level such as stress/strain theories, affect/emotion theories, and theories of motivation. Some studies in our review would explore how leadership relationships occurred all in one day (e.g., Barnes et al., 2015; Breevaart & Bakker, 2018; Christensen-Salem et al., 2018) while others explored how leadership relationships existed from one day to the next (e.g., Courtright et al., 2016; Lavy et al., 2017; Schilpzand et al., 2018). For many studies, it was not clear why they focused on relationships only at a day level or at a day-to-day level. Some studies did incorporate time as a part of their study. For example, Qin et al. (2018) found that the leader personal benefit of improved recovery levels from abusive supervision is short-lived for the leader and Meier and Gross (2015) found that followers only retaliate incivility towards leaders' incivility when the follower reacts quickly.

There are several different ways in which time may be included in leadership theories to get a better understanding of the dynamics of leadership behaviors. First, time (e.g., the day of the week, the time during the day) may be an explicit predictor of leadership behaviors. For example, could leaders be less likely to engage in transformational behaviors towards the end of the day, and perhaps engage in more abusive behaviors towards the end of the day due to fatigue or resource drain? Or, what might be the consequence of daily leadership behaviors when leaders are called to work additional hours after the typical workday? Finally, does the day of the week have implications for what types of behaviors leaders engage in or follower responses to leader behaviors? Exploring daily leader behaviors by including time in different ways opens up opportunities to answer different types of research questions that can enhance our understanding of the dynamics of leadership.

Another important way that future research may seek to incorporate time is to examine the time-lagged effects of daily leadership behaviors. A few studies in our review explored time-lagged effects in their studies (e.g., Qin et al., 2018). Future scholars could explore additional time-lagged effects in daily leadership behaviors, since this is an important way to understand the causes and consequences of short-term leader behaviors. For example, understanding how long leader behaviors last before they are diminished in value will be key for future scholarly work. Specifically, what types of leadership behaviors have more enduring effects and which are more fleeting? For example, because "bad" is often more powerful than "good" (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001) it would be interesting to understand if destructive leader behaviors have longer-lasting impacts on follower states compared to other constructive leader behaviors. This could also hold true for the antecedents to leadership behaviors – negative antecedents (e.g., traffic coming to work), may have a longer-lasting effect than positive antecedents (e.g., feeling well-rested) on leader behavior.

Measure multiple leader behaviors

Leaders may exhibit many different types of leader behaviors and daily studies are particularly well equipped to capture how different leader behaviors relate and coexist. General measures of leadership are often not precise enough and do not capture the transient nature of leader behaviors. Daily studies that use a within-person design can challenge and change how we view the relations between leader behaviors. For example, Breevaart et al. (2014) showed that leaders can be transformational, rewarding, and controlling all on the same day. In addition, Lin et al. (2016) found that leaders who behave ethically on one day, are more likely to behave abusively the next day, as explained by moral licensing and ego depletion. However, in the studies in our review, few studies included multiple leader behaviors (6/74 articles 8%), and even less had more than two leader behaviors (3/74 articles

Table 4
Recommendations for future research.

Weakness	Directions for future research	Examples
Few studies incorporated time into their hypothesizing and models.	Depth Future research could explicitly consider time into their theorizing and study design.	Research could explore how time of day affects leader behavior and seek to understand how long destructive and constructive leader behaviors affect followers at the daily level of analysis.
A majority of studies focused on only one type of leader behavior, but daily studies can provide theoretical insight into how leader behaviors relate and coexist.	More future research could examine multiple leader behaviors in a single study	Research could explore how stable leadership behaviors interact with daily leadership behaviors to affect both leader and follower daily outcomes.
Many studies tested theories using general measures of theoretical constructs.	Future scholars should be more precise in their daily measures to test theory in unique ways.	Research could examine specific emotions when testing affective events theory or specific demands when testing job demands-resources theory.
Some of the studies in our review looked at leader behaviors that were very broad (e.g., supportive leadership, transformational leadership)	Future research could do a better job of looking at more specific leadership behaviors.	Instead of studying supportive leadership, scholars could examine which types of supportive behaviors are most important.
Few studies used leader interventions.	Breadth Researchers could utilize leader interventions in their daily study designs.	Scholars could seek to understand the short-term/daily consequences of leadership interventions, such as gratitude or strengths-based training.
Few studies used objective measures in their design.	Future research could better incorporate objective measures (especially objective dependent variables) into study designs.	Instead of relying on self-report or other-report data, scholars may incorporate objective measures such as daily exercise measured by a heart rate monitor on a fit-bit, to understand how daily physical exercise might affect leader behavior.
Some leadership behaviors have been understudied at a daily level. No studies have specifically looked at how daily followership could affect leaders' emotions, attitudes, and behaviors.	Future research could specifically examine these understudied areas. Followers play an important role in crafting leadership, and research could explore how daily followership affects leaders.	Research could explore daily servant, humble, and laze-faire leadership behaviors more extensively Future research could explore how followership occurs on a daily basis.
Studies in our review primarily relied upon MEMs to test their hypotheses.	Researchers should be aware of the different ways to model clustered data and assure that they are correctly modeling their data.	Future research could be more explicit about how they model their data and make sure that they explain how they meet the necessary assumptions for the model that they use.

4%). More daily studies of leadership should include multiple types of leader behaviors because it can extend understanding of leader behaviors that may be difficult to capture at a general level of analysis and can challenge how we understand leadership.

Relatedly, no study explored both daily and general leadership behaviors together in one study. It would be interesting to see more studies taking a multilevel approach to leadership – to see how daily processes affect general behaviors (and vice versa) and to understand how the two interact. For example, do followers whose leader is generally inspiring and supportive react differently when their leader is laissez-faire or abusive on a specific day compared to followers whose leader is generally uninspiring and unsupportive? One could argue that for the former group of followers, a daily deviation from the leader's general behavioral patterns is seen as a breach of trust, yet one could also argue that for this group of followers, leaders have some credits to temporarily deviate from their usual behavior.

Use discrete and precise measures

When building leadership theory through daily studies, using more precise and discrete measures of theoretical constructs can add rich detail to the process of leadership. When using more general measures of constructs (e.g., general affect, task demands, OCB), daily studies often fail to capitalize on their opportunity to explore unique and novel relationships. Further, more general measures of theoretical constructs can often be effectively measured at a more general level of analysis. For example, when exploring affective events theory, rather than exploring how daily constructive leader behaviors can cause follower daily positive affect scholars can be more precise. Future scholars could explore how specific daily constructive leader behaviors (e.g., vision communication, servant, humble, supportive) are linked with specific follower emotions. For example, is daily humble leadership more strongly related to follower feelings of gratitude whereas daily empowering leadership is more strongly related to follower feelings of excitement? Do different types of follower positive (or negative) emotions from their leaders' daily behaviors yield different follower

outcomes? Or, do most follower positive (or negative) emotions caused by leaders generally lead to similar outcomes?

Task demands (when testing job demands-resources theory) is another example where future researchers can be more precise and measure discrete, daily task demands and how they relate to daily leadership. For example, how do daily meeting demands affect daily leadership behavior? Or, how do follower specific demands relate to leader daily behaviors? Rather than just exploring general daily demands, scholars have an opportunity to be more exact in their measurement. Not only will this help build theory by exploring novel relationships but can also answer interesting questions and provide insights into leadership that have traditionally been overlooked.

Specificity of leader behaviors

We encourage future researchers to be more specific about the leader behavior studied. For example, instead of simply studying supportive leadership, future research should be more specific about how leaders are supportive of their followers on a daily basis. A number of studies in our review were specific about different types of leader supportive behavior measured (e.g., Christensen-Salem et al., 2018; Germeyns & De Gieter, 2017; Liu et al., 2015; Shockley & Allen, 2013) and this should continue in the future. Also, transformational leadership has recently come into criticism for being too broad (Van Knippenberg & Sitkin, 2013). However, transformational leadership was one of the most studied constructs in our review. We echo the recommendation put forward by Van Knippenberg and Sitkin (2013) to study the dimensions of transformational leadership, and encourage future daily leadership research to study the dimensions of transformational leadership. Finally, future research could also drill down and find out which type of abusive supervision behaviors, when enacted on at the daily level, are most detrimental for followers.

Breadth

Types of leader behaviors

Overall, previous leadership research has looked at a wide array of leader behaviors. However, there are still some behaviors that have been understudied by daily leadership scholars. Based on our review of the literature, we encourage scholars to broaden the spectrum of leadership behaviors studied in a daily fashion. For example, humble leadership has been gaining popularity in recent years (Owens, Yam, Bednar, Mao, & Hart, 2019), but no previous study has focused on daily humble leadership.

Furthermore, we did not find any daily study on laissez-faire leadership. Laissez-faire leadership occurs when leaders do not interfere with their followers, but rather withdraw themselves from the workplace. Whereas some scholars consider laissez-faire a type of non-leadership, others see laissez-faire as a form of destructive leadership (for a discussion on laissez-faire leadership, see Einarsen, Aasland, & Skogstad, 2007 and Schyns & Schilling, 2013). Future work could study laissez-faire leadership on a daily level of analysis. This research could give some insights into the discussion of laissez-faire leadership, taking into account the reasons why leaders withdraw themselves from the workplace. For example, could it be an effective strategy to withdraw oneself from the workplace when facing high work demands, rather than engaging with followers with the risk of having a fallout? And does it make a difference whether leaders are generally engaging (or not) and how many days leaders withdraw themselves from the workplace? Future research is needed to answer these, and other, interesting questions regarding different daily leadership behaviors.

Followership and followers

Daily studies could also help scholars study followership and how it alters leader behavior on a daily basis. No studies in our review explored daily followership but followership likely plays an important role in a leader's daily behavior. For example, scholars may explore how followers' leader-directed citizenship behavior or proactive behavior may elicit positive types of leader behaviors, such as transformational leader behaviors. Scholars may also explore, from a moral licensing perspective, how follower positive behavior could create moral credits for a leader that might increase future negative leader behaviors.

Relatedly, prior research has highlighted the benefits of leaders adjusting their leadership behaviors to the needs of their followers (e.g., De Vries, Roe, & Taillieu, 2002; Lambert, Tepper, Carr, Holt, & Barelka, 2012). Indeed, one of the articles in our review examined how the daily fit between transformational leadership needed and received leads to follower positive affect and subsequent job satisfaction (Tepper et al., 2018). However, each follower may have different needs, and frequently adjusting behavior may be cognitively and emotionally draining for leaders. Future daily leadership studies could look at both the benefits and the downsides to leaders frequently changing their types of behaviors throughout the day when interacting with different followers.

Leader interventions

The study of daily leadership behaviors also lends itself to understand the implications leadership interventions and training have for leaders in the short-term. For example, Lanaj et al. (2019) examined how leader reflection could positively influence the leader's daily behaviors. Organizations spend millions of dollars each year on leadership development. Understanding effective leader interventions that improve daily leadership behaviors has important implications for practitioners. Further, understanding the means by which a leader can alter their leader behaviors will have important implications for both followers and organizations alike. For example, scholars might explore how a leader gratitude intervention or strengths-based training can impact a leader's daily leadership behavior. Research that can highlight practical interventions, trainings, or resources that improve daily leader

behaviors will be an important way in which daily studies of leadership can make academic leadership studies more applicable to organizations.

When measuring the effect interventions have on leader behaviors, scholars could also use a daily ESM before the intervention and then several months after the intervention (see Camburn, Spillane, & Sebastian, 2010 and Nielsen & Daniels, 2012 for examples). This type of study design would allow scholars to utilize the benefits of ESM studies, but would also better measure the longer-term effectiveness of the intervention. In a similar vein, multiple ESM studies could be used over a longer period of time in order to get a more detailed understanding of how leadership processes and leadership development evolve over time.

Objective measures

Although objective data is sometimes used in daily leadership studies, most of the studies still use self-reports to gather information on private feelings that are difficult for others to assess. Daily ESM studies do not resolve the methodological disadvantages of self-reports, but they do minimize many of the concerns. Global self-reports are more strongly influenced by memory bias because when followers are asked to think back over the last months or report general feelings about an event, their answers often reflect general beliefs or attitudes (Schwartz, 2012; Sonnentag, Dormann, & Demerouti, 2010). Because of its proximity to the events, ESM helps reduce memory and estimation problems. However, also due to its proximity, ESM can increase affective bias. Therefore, future research on daily leadership behaviors could benefit from the inclusion of more objective measures in combination with subjective measures.

Barnes et al. (2015), Almeida et al. (2016), and Shockley and Allen (2013) are all examples of articles that used both objective and subjective measures in their studies. Barnes et al. (2015) included a measure of sleep duration. However, new methodologies such as sleep tracking devices and location trackers (e.g., measuring whether you are at home, at work, or in nature) now allow for even more objective context measures (e.g., receiving a notification when you wake up). Almeida et al. (2016) used daily saliva samples to measure cortisol levels. Shockley and Allen (2013) used wristwatches to measure heart rate and blood pressure throughout the day. Pairing subjective measures with daily objective measures whenever possible and suitable, would enhance the quality of daily leadership studies and the quality of leadership research in general. For example, future studies could use car tracking devices to track how leader-induced follower aggression affects subordinates' driving behavior on their commute home. Or future work may explore how physical exercise may be an important antecedent to constructive leader behaviors. With sleep, while prior research has examined how lack of sleep leads to abusive supervision (Barnes et al., 2015), future studies could look at whether abusive supervision increases difficulties for followers to fall asleep due to rumination. Finally, while it would be difficult to get objective measures of daily job performance in many jobs, there are some jobs that have objective, daily job-performance measures (e.g., call centers, sales companies, restaurants) that could be used in conjunction with daily studies of leadership.

Modeling of data

Studying daily life (i.e., gathering information about the same person at multiple days) inherently results in hierarchical, or clustered, data (i.e., days nested within persons). Recently, McNeish and Kelley (2019) as well as Antonakis, Bastardoz, and Rönkkö (in press) showed that the ways in which clustered data are modeled is highly dependent on the discipline in which the study is conducted. Specifically, researchers in the field of economics primarily use fixed-effects models (FEM), and some scholars have suggested that this is the "gold standard" for modeling clustered data (Schurer & Yong, 2012); whereas mixed-effects models (MEM; also known as random effects models;

McNeish & Kelley, 2019) are more commonly used in the fields of psychology and management. As these authors rightfully note, rather than co-existing, it is important that both fields learn from one another to advance scientific practice.

One major benefit of MEMs is that they can incorporate both level-1 and level-2 effects (or more), whereas FEMs can only incorporate level-1 effects and account for the clustered nature of the data using dummy codes. Yet, MEM's require that the random effects assumption (also called exogeneity assumption) is met, meaning that the predictor variables do not covary with the random effects. If this assumption is violated, it means that estimates may be biased due to unmodeled variables at the second level (e.g., a person's personality or intelligence may affect a person's daily behavior). Antonakis et al. (in press) provide an overview of the possibilities to test the random effects assumption (i.e., Hausman test, Likelihood ratio test and Wald test).

One way to bridge the gap between MEMs and FEMs – to avoid endogeneity and at the same time model Level 2 effects – is to use a within-between specification of a mixed-effects model (WB-MEM, also called correlated random effects models; Antonakis et al., in press; Mundlak, 1978). These models include the cluster means of group-mean-centered Level 1 predictors as Level 2 predictors and as such separate the estimation of within- and between-cluster effects. We encourage future leadership scholars, particularly those who conduct daily studies of leadership, to consider the (dis)advantages of all the above-mentioned models and make a conscious decision about how to best analyze their data. Antonakis et al. (in press) provide a very useful decision chart that may help researchers to decide what type of model is appropriate to test their multilevel models depending on the type of effects that are of interest as well as the random effects assumption.

Conclusion

This review has highlighted previous research that has examined the daily causes and consequences of leadership behaviors. By reviewing the theoretical, behavioral, and methodological trends in daily leadership research we hope that our review will provide a basis for best practices that can be utilized as a reference for those wishing to examine daily leadership behaviors. While prior leadership research at the daily level has begun to uncover and expand our understanding of leadership, we have highlighted a number of areas for future scholarly work. In so doing, we hope that future studies of daily leadership behaviors can extend our breadth and expound our depth of our understanding of daily leadership.

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Review

Leading teams in the digital age: Four perspectives on technology and what they mean for leading teams

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ABSTRACT

Digital technologies are changing the nature of teamwork in ways that have important implications for leadership. Though conceptually rich and multi-disciplinary, much of the burgeoning work on technology has not been fully integrated into the leadership literature. To fill this gap, we organize existing work on leadership and technology, outlining four perspectives: (1) technology as context, (2) technology as sociomaterial, (3) technology as creation medium, and (4) technology as teammate. Each technology perspective makes assumptions about how technologies affect teams and the needs for team leadership. Within each perspective, we detail current work on leading teams. This section takes us from virtual teams to new vistas posed by leading online communities, crowds, peer production groups, flash teams, human-robot teams, and human-artificial intelligence teams. We identify 12 leadership implications arising from the ways digital technologies affect organizing. We then leverage our review to identify directions for future leadership research and practice.

Introduction

The digital age has changed the nature of work in ways that were unimaginable even a decade ago (Barley, Bechky, & Milliken, 2017). Technological advances have shifted many people from working inside formal organizations to working as loosely connected members of a larger community, such as the virtual office employees across major industries (Joshi, Lazarova, & Liao, 2009). Technological advances have given rise to the gig economy, where individuals sell their services directly to the market (Petriglieri, Ashford, & Wrzesniewski, 2019). Crowd workers contract their time and skills on an as-needed basis on e-commerce sites like Upwork, an online platform that “expertly matches professionals and agencies to businesses seeking specialized talent” (Upwork, 2019), and MTurk, a “crowdsourcing marketplace that makes it easier for individuals and businesses to outsource their processes and jobs to a distributed workforce who can perform these tasks virtually” (MTurk, 2018). There are many ways digital technologies are transforming the nature of work. The permeation of digital technologies is *not* changing the widespread organization of work into teams, but it is changing the nature of teamwork. Consider these examples:

- Organizations from Netflix to NASA regularly use online tournaments to source innovation (Dissanayake, Zhang, Yasar, & Nerur, 2018; Lifshitz-Assaf, 2018).

- Internet sites like Upwork allow Fortune 500 companies to hire freelancers from around the world to perform skilled and specialized work (Green, Walker, Alabulthim, Smith, & Phillips, 2018).
- The free online encyclopedia Wikipedia is maintained by volunteers who produce a product with comparable accuracy to traditional encyclopedias (Giles, 2005).
- Robots now routinely assist physicians and nurses during a wide range of surgeries (Lanfranco, Castellanos, Desai, & Meyers, 2004).

Each example describes work that has been enhanced in some way through advances in computing. All four examples involve teams performing work that has and continues to change with advances in digital tools. In the cases of Upwork and Wikipedia, the internet has enabled a new kind of organization: the online community, where relationships are informal and participation is voluntary. Although contributions to Wikipedia are unpaid, contributions to Upwork are paid at a negotiated rate. On Upwork, individuals can create a team project (i.e., “enable teams”) and staff the team with contractors located around the world. Traditional organizations like Netflix and NASA are leveraging these advances to help them innovate. All four examples demonstrate the exciting ways technology is transforming the basic nature of teamwork (Fan & Yen, 2004).

This fundamental transformation of teamwork vis a vis technology has important implications for leadership. Teams are using an

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increasingly sophisticated array of technologies to work together - relatively basic messaging and video conferencing systems have been joined by enterprise social media (e.g., Slack, GroupMe) and collaborative editing suites (e.g., Google Drive, Microsoft Teams). Though technologies have been shifting the landscape of teams for some time, these shifts are becoming more transformative. Technologies have, for some time, enabled individuals to collaborate in teams over great distances. They are now shaping who comes together in teams and allowing teams to scale up in much larger networks of teams. If the 20th century saw the rise of self-managing work teams (Stewart & Manz, 1995), the 21st century introduces us to teams with crowd workers, paid or unpaid workers who organize via the internet, operate outside formal organizations, and may never meet in person (Dow et al., 2011; Kittur et al., 2013).

Technologies are also creating new kinds of team members. Whereas most basic definitions of teams begin with "two or more individuals" (Kozlowski & Ilgen, 2006), the digital age invites organizational scholars to rethink what constitutes a team member. Rapid advances in robotics (Burke, Murphy, Rogers, Lumelsky, & Scholtz, 2004; Chui, Manyika, & Miremadi, 2016; Manyika et al., 2017) and Artificial Intelligence (AI; Chui et al., 2018; Yen et al., 2001) are introducing technologies to teams as autonomous team members. Although robots and algorithms have long been replacing some individuals (e.g., robots used in manufacturing) and augmenting the capabilities of others (e.g., surgical robots; Van Den Berg et al., 2010), we are fast approaching a time when autonomous agents are motivated beings working alongside their human counterparts.

The popular press is replete with futuristic thinking on the changing nature of work (i.e., Lund et al., 2019; Marr, 2019; Schwartz, Collins, Stockton, Wagner, & Walsh, 2017), and there is great demand for managerial training to equip leaders for the digital age. How managers leverage AI may well be the major differentiator between those who succeed and those who fail at leading in the age of AI: "the advances of brilliant machines will astound us, but they will transform the lives of senior executives only if managerial advances enable them to" (Dewhurst & Willmott, 2014). The success of teams in settings that span the many industries being transformed by technology - healthcare, entrepreneurship, space exploration, entertainment - hinges on concurrent advances in leadership.

The central premise of this review is that the digital transformation of work makes leadership even more critical to team effectiveness in a variety of ways. Furthermore, how we view technology's role in teams creates different implications for leadership. In order to more concretely understand the leadership implications of technologies, we reviewed the research on team leadership as it relates to digital technology. In doing so, we identified four perspectives on the role of technology in teams. These four perspectives are depicted in Fig. 1, along with an approximate timeline of when we started to see research reflective of each technology view. Each of these views makes a distinct core assertion about the role of leadership in supporting teamwork.

There have been a number of excellent recent reviews on team leadership (c.f., Burke, Diaz-Granados, & Salas, 2011; Kozlowski, Mak, & Chao, 2016), though there has not been a review explicitly focused on the implications of technology for team leadership. Given the changes in teamwork described in our opening, such a review is sorely needed to highlight the specific ways that technology can condition, create, and shape team leadership. The central aim of our review is to bring digital technology more clearly into focus in order to understand the leadership implications of leading in the digital age.

Our review juxtaposes technology and team leadership. We review key findings from technology-rich domains as they relate to team leadership in order to highlight the leadership implications stemming from each technology perspective. In doing so, we unveil new insights about leading teams in an age of unprecedented technological transformation. Our primary contributions are twofold.

Fig. 1 previews the key components of our review. In the center, we

depict the four perspectives on digital technology we identified in our review, we label these: digital technology as a team context, digital technology as sociomaterial team practices, digital technology as team creation medium, and digital technology as a teammate. We also note the approximate timeframe when prominent theorizing about technologies began to adopt each of the four perspectives included in our review. Along the bottom of Fig. 1 we have listed some examples of the terms used in research examining the ways emerging technologies affect teams. Starting from the left, we list one of the earliest terms "computer-supported groups." Though we begin our review in earnest after the turn of the century, we included this term for completeness as this was a period that ignited interest in teams and technology. Around the turn of the century, substantial attention was paid to "virtual teams" whose members used technologies to collaborate remotely. On the bottom of Fig. 1 we have listed some examples of the focal technologies that scholars had in mind as they studied technology and teams. The far right of the figure denotes the leadership findings and implications that comprise the bulk of our review. For each technology perspective, we review the research that relates to team leadership, summarizing the leadership implications that come into focus when we take on each of the four technology perspectives. We present the timeline as a guide for understanding the loose temporal associations between theorizing on team leadership, technology, and emerging team forms. Though we note that our review of findings does not proceed chronologically; rather we organized findings according to the technology perspective reflected in the study. For each technology perspective, we review findings as they relate to team leadership.

Research on team leadership generally emphasizes two dimensions: leadership functions and leadership forms. The first dimension is *team leadership functions* (McGrath, 1962; Zaccaro, Rittman, & Marks, 2001). This dimension highlights the need for leaders to ensure the core needs of the team are satisfied "with the ultimate aim of fostering team effectiveness" (Morgeson, DeRue, & Karam, 2010). Though taxonomies differ, most encompass the need for teams to develop strong *affective emergent states* like trust and cohesion, the need to develop *cognitive emergent states* like shared mental models and transactive memory systems, and the need to enact *behavioral integration processes*. *Leadership forms* describe the pattern or topology of how leadership is carried out by the team. Some common team leadership forms include hierarchical, shared, distributed, and rotated leadership (Contractor, DeChurch, Carson, Carter, & Keegan, 2012). Research shows collective forms of leadership are more beneficial than hierarchical forms in promoting team effectiveness (D'Innocenzo, Mathieu, & Kukenberger, 2016; Nicolaides et al., 2014; Wang, Waldman, & Zhang, 2014).

Based on these two dimensions, *team leadership* can be thought of as actions taken by one or more team members to ensure that team needs are being met. Zaccaro et al. (2001) summarize a number of team leadership actions: recognizing and constructing team problems, generating, planning, and implementing solutions to those problems, and coordinating and monitoring the implementation of those solutions. Together, leadership functions and forms provide a useful framework for understanding leadership in the digital age.

We review the findings related to team leadership that explicitly focus on some aspect of digital technologies. We began our review by searching for articles with keywords such as "leader" and "technology". We knew that our literature search would need to take place across disciplines as the research on leadership and technology is cross-disciplinary and much of the human-technology interaction work is in fact occurring in disciplines other than the organizational sciences. Thus, we also skimmed the abstracts of articles with the terms "group", "team", "collective", and other group-related terms to see how other disciplines might be talking and thinking about team leadership and technology. In reviewing these studies, we saw evidence of four perspectives on technology that serve as the major categories of our review.

The first two perspectives are prevalent in technology studies. *Technology as context* views technology and social practices as distinct

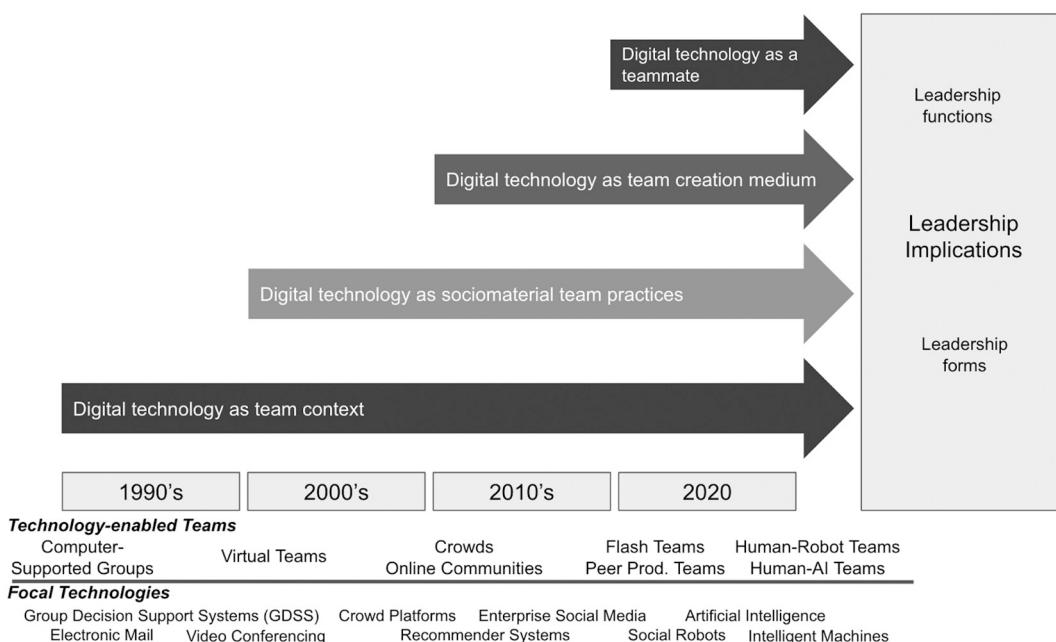


Fig. 1. Four perspectives on digital technology with implications for leading teams.

entities. The technology is a situational context that creates conditions that affect social practices. The second view, *technology as sociomaterial*, explores “the ways that [a technology’s] physical and/or digital materials are arranged into particular forms that endure across differences in place and time” (Leonardi, 2012, p. 29), and views material aspects of technology and social practices as *mutually dependent ensembles* such that there is “an inherent inseparability between the technical and the social” (Orlikowski & Scott, 2008, p. 434). Most current work on team leadership takes one of these two perspectives on technology.

The third perspective, *technology as team creation medium*, explores the ways that technology platforms are shaping who forms teams and how they form them. Research in this area focuses on the role of technology in the initial formation and later reformation of teams. The prevalence of large online communities and new ways of organizing are expanding the role of team leaders, and in some cases, replacing leader activities with algorithmic control. A fourth perspective is emerging in which technology is a motivated social being: *technology as teammate*. With the rise in automation in our everyday lives, we are becoming dependent on our technological teammates at home and at the office. Intelligent machines are helping us pilot our airplanes, select new employees, and crunch numbers in order to make organizational steering decisions, just to name a few examples. This perspective will influence how leaders manage team members, both humans and intelligent agents, and has important ethical considerations for leaders as this perspective of teaming becomes increasingly prevalent in our organizations. In the next section, we review scholarship on digital technologies and team leadership in order to foster greater linkages between the two and to highlight the key leadership implications suggested by work in each domain.

A review of technology and team leadership

Table 1 provides a useful guide for the review that follows. We summarize each of the four technology perspectives and their implications for leadership. **Table 1** allows us to compare and contrast the perspectives in terms of: (1) how digital technologies relate to teamwork and (2) the leadership needs created by technology when viewed from each perspective. We begin by considering research conducted from the first technology perspective.

Technology as context

The first area of research on technology and organizing considers *technology as team context*. This view holds that technology has fixed features that set up the context in which team processes take place (Table 1). According to this view, when teams use digital technologies to interact with one another, the technology is an important aspect of the leadership situation. According to this view, we would understand a distributed team convening via videoconference by looking separately at the team process behavior on the one hand and the features of the video conference system (e.g., clarity, refresh rate, pan-tilt-zoom, audio-video timing) on the other. In this view, technology is separate from the team; there are teams who use technology and those who do not. There are teams who use information-rich technologies and those who use less rich tools. Technology as context considers technology as having features that determine important aspects of the leadership situation.

The context perspective of technology in teams grows out of a long-standing view of teamwork and leadership as situated in context. Reviews of context in psychological leadership research (Liden & Antonakis, 2009; Maloney, Bresman, Zellmer-Bruhn, & Beaver, 2016) demonstrate a long history of context as a consideration in the study of teams and leadership. One area of research that took a technology as context perspective in its examination of leadership is that of E-leadership (Cascio & Shurgailo, 2003; Zaccaro & Bader, 2003). E-leadership theorizes the leadership needs of those “who conduct many of the processes of leadership largely through electronic channels” to begin to study leadership in virtually collaborating teams (also Avolio, Kahai, & Dodge, 2000; Avolio, Sosik, Kahai, & Baker, 2014; Hedlund, Ilgen, & Hollenbeck, 1998; Johnson, Suriya, Yoon, Berrett, & La Fleur, 2002; Sosik, Kahai, & Avolio, 1998; Tyran, Tyran, & Shepherd, 2003).

Other work advocates the need for greater attention to context in leadership research in general (Johns, 2006, 2017, 2018). Johns suggests that context is often mishandled in organizational behavior research and offers useful dimensions through which to understand leadership in context: the omnibus context and the discrete context. The omnibus context is the overarching context in which leadership occurs and represents the “who, where, when, and why” of the context. The discrete context represents the task, social, and physical context of the team. The omnibus context encompasses the discrete context. These

Table 1

Four Perspectives on technology and their implications for leading teams in the digital age.

Technology perspective	How digital technology relates to teamwork	Leadership needs created by technology
Technology as team context	Technology has mostly fixed features that place constraints on the team and constitute a meaningful aspect of the team's context.	Technology features determine important aspects of the leadership situation.
Technology as sociomaterial team practices	Technology practices come about when team needs meet material features of technology; technology and teamwork are mutually dependent ensembles.	Material features of technology and behavioral intentions jointly create affordances for leading and collaborating in teams.
Technology as creation medium	Technology enables teams to form in new ways within and outside of formal organizations.	Digital tools and platforms enable leadership processes enacted during team formation.
Technology as teammate	Technology is a member of the team, fulfilling a distinct role that directly contributes to team performance.	Leadership needs to facilitate relationships among human and synthetic team members.

two dimensions of context are proposed to help scholars think about how their study of context and the generalization of contextual findings can occur in a more rigorous and structured way. In thinking about teams in the digital age, new technologies influencing leadership processes are part of the larger, “omnibus” context, the “who, where, when, and why” of the context.

Similar to Johns' dimensions of organizational context, Morgeson and colleagues suggest a model for understanding team leadership functions in which one must understand the context of the team, the organization, and the environment in order to understand leadership processes and subsequent team effectiveness (Morgeson, Lindner, & Loring, 2010). Oc (2018) builds directly on the Johns (2006) framework for understanding organizational context and proposes a framework for understanding leadership and team context. Oc proposes that the omnibus and discrete contexts interact with leadership influencing processes (i.e., leader behaviors, follower attributions, leader-member exchange, etc.) and leadership outcomes (i.e., effectiveness, cognition, attitude, and behavior). In sum, technology as context stems from a popular and well-developed perspective of research on the context of leadership in general.

Much of this work on technology as context uses the notion of team virtuality. Team *virtuality* is comprised of: “(a) the extent to which team members use virtual tools to coordinate and execute team processes... (b) the amount of informational value provided by such tools, and (c) the synchronicity of team member virtual interaction” (Kirkman & Mathieu, 2005, p. 702). Another definition of *virtuality* includes geographic dispersion, electronic dependence, structural dynamism, and national diversity (Gibson & Gibbs, 2006). Scholarship on virtuality holds technology as having fixed objective properties that constitute the context in which leadership occurs. These definitions of virtuality serve to underscore the emphasis of technology as a piece of the environment in which organizing occurs, which is core to work taking viewing technology as a context for teamwork.

Work examining technology as a context in teams began with the study of computer-supported work groups in the 1990's (i.e., Constant, Sproull, & Kiesler, 1996; Zack & McKenney, 1995). The work on computer-supported work groups morphed into what we know of today as “virtual teams” (Bell & Kozlowski, 2002; Dulebohn & Hoch, 2017), also sometimes referred to as global virtual or globally-distributed teams as well (Gajendran & Joshi, 2012; Kayworth & Leidner, 2002; Kotlarsky & Oshri, 2005; Oshri, Van Fenema, & Kotlarsky, 2008). Virtual teams are defined as “groups of geographically and/or organizationally dispersed coworkers that are assembled using a combination of telecommunications and information technologies to accomplish an organizational task” (Townsend, DeMarie, & Hendrickson, 1998, p. 17). As a guide, Table 2 includes a list of definitions for some of the various labels applied to technology-enabled teams.

From a technology as context perspective, we see that leadership requires unique considerations on the part of the leader in technologically-enabled contexts (Dulebohn & Hoch, 2017; Meyer, 2010). There is a “consensus among scholars that virtual teams are more difficult to lead than face-to-face teams” (Hoch & Kozlowski, 2014, p. 391). Team

leadership needs to compensate for the challenges created by virtual collaboration. Difficulties in leading such teams relate to both leadership functions and leadership forms.

A large body of research has examined leadership functions in teams with technology taken as a context. Specifically, research has focused on the challenges leaders face specific to team affective processes, such as relationship-building, which fosters team states such as team cohesion and team trust (Powell, Piccoli, & Ives, 2004). Face-to-face teams have been shown to have higher levels of cohesion than virtual teams (Straus & McGrath, 1994; Warkentin, Sayeed, & Hightower, 1997), and teams using chat have lower levels of cohesion compared to face-to-face teams and videoconferencing teams (Hambley, O'Neill, & Kline, 2007). Computer-mediated teams are also generally less satisfied in their team interactions than face-to-face teams (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002). Trust is integral to virtual team functioning, but is also difficult to form virtually (Jarvenpaa & Leidner, 1999; Paul & McDaniel Jr, 2004).

Research has also tackled the issue of team behavioral processes in technology as a context, including communication and coordination (Powell et al., 2004). Communication in virtual teams can be challenging (Hambley et al., 2007). Virtual teams communicate through multiple different channels, often including both instant messaging through an enterprise social media platform and video conferencing. Sometimes virtual team members can actually see the faces of their team members, and other times, virtual team members only have text to go off of to interpret a team member's meaning behind their words. Nonverbal communication is a primary challenge for communication in virtual teams (Sproull & Kiesler, 1991). Likewise, utilizing technology for coordination of virtual team members can pose a challenge. Virtual team members may come from different time zones so the physical coordination of work can become asynchronous from one another, making coordination challenging (Montoya-Weiss, Massey, & Song, 2001). Virtual team members also may encounter cultural differences, especially global virtual teams, which may mean team members have different preferences and work styles (Maznevski & Chudoba, 2000; Meyer, 2015).

Finally, research has investigated team cognitive processes in technology as a context. Cognitive processes are especially difficult to develop in teams whose members rarely if ever meet in person. However, formation of transactive memory systems in virtual teams is essential to effective team task performance. Research on knowledge coordination in virtual teams has shown that virtual teams form mental maps of member's knowledge, but that these mental maps, “transactive memory systems”, take a considerable amount of time to form (Kanawattanachai & Yoo, 2007).

Research has found that leaders play an integral role in virtual team functioning, and virtual team leaders can help to tackle challenges caused by the virtuality of their teams through a few different means (Gibson & Gibbs, 2006; Gilson, Maynard, Jones Young, Vartiainen, & Hakonen, 2015). Research has demonstrated that leaders in virtual teams are critical in encouraging positive team interactions and reducing negative team interactions, such as team conflict (Wakefield,

Table 2

Definitions of exemplar technology-enabled team types.

Entity	Definition	Exemplar citation(s)
Computer-supported work groups	Two or more people who communicate and make decisions using specialized computer hardware and software.	DeSanctis & Gallupe, 1987
Virtual teams	Virtual teams are groups of people connected by a shared goal that use technology in order to interact with each other.	Martins, Gilson, & Maynard, 2004
Online community	A virtual space where people come together with others to converse, or to exchange information or other resources.	Resnick & Kraut, 2011
Crowd	People who self-organize online around a common purpose; typically that purpose was “once performed by employees and is now outsourced to a network” of people through an “open call” for participation.	Howe, 2006
Peer production group	Individuals who come together to “harness the collaborative efforts of many individuals in order to create artifacts of lasting value”	Kittur et al., 2009
Flash team	A team that is dynamically assembled with paid experts drawn from a crowd.	Retelny et al., 2014
Human-robot team	Team comprised of humans and <i>embodied</i> intelligent agents working interdependently in pursuit of a common goal.	DeCostanza et al., 2018
Human-AI team	Team comprised of humans and intelligent agents working interdependently in pursuit of a common goal.	DeCostanza et al., 2018

(Leidner, & Garrison, 2008). Virtual team leaders can help facilitate team norms for how the team will go about communicating and coordinating with one another (Malhotra, Majchrzak, & Rosen, 2007). Clearly establishing norms for communication and coordination can help to establish trust among team members by providing clear expectations for themselves and others. Fostering high quality communication can help increase trust in virtual teams (Marlow, Lacerenza, & Salas, 2017). High quality communication has been shown to be predictive of who emerges as a leader in virtual teams (Gilson et al., 2015; Gluckler & Schrott, 2007). Leaders that help to foster interpersonal communication as opposed to more task-focused communication can help increase cohesion and trust in virtual teams (Gupta & Govindarajan, 2000). When virtual teams support more social communication among team members, virtual teams report higher levels of trust (Jarvenpaa & Leidner, 1999) and interpersonal relationships (Robey, Khoo, & Powers, 2000). Interestingly, one study found that if virtual team member actions are made more visible to the rest of the team, then the effects of virtuality on trust may be lessened compared to teams with less visible team member actions (Goh & Wasko, 2012).

Leaders can also help to overcome the challenges of virtual teaming through cultivating psychological safety among team members. Psychological safety is the shared belief that the team is an accepting place for taking interpersonal risks. Making mistakes is an accepted part of learning, and team members encourage each other to speak up (Edmondson, 1999). High levels of psychological safety have been shown to help mitigate the challenges of working and leading in virtual teams such that communication and coordination is less challenging in a psychologically safe environment (Gibson & Gibbs, 2006).

Finally, some styles of leadership are more conducive than others in fostering productive teamwork in virtual teams. Transformational leadership in virtual teams was associated with higher team performance, team satisfaction, and team motivation (Andressen, Konradt, & Neck, 2012; Gilson et al., 2015; Purvanova & Bono, 2009; Whitford & Moss, 2009).

In sum, leaders may be able to help virtual teams overcome the challenges of virtuality by encouraging visible, high quality, socially-oriented communication in order to help build trust and cohesion among virtual team members. Leaders can also help to encourage psychological safety among team members to help with virtual team communication and coordination. Finally, transformational leadership behaviors may be more beneficial than transactional behaviors in overcoming the challenges faced by virtual teams.

Taken together, these findings summarize ways that team leadership meets team needs when team members are working remotely largely through and with digital technologies. The key assumption about leading teams from this technology perspective is that technology features determine important aspects of the leadership situation. We summarize the findings reviewed in this section as suggesting the

following leadership implication:

Leadership Implication #1. *Team leaders need to compensate for the challenges that virtual teams face in developing affective and cognitive states and enacting team processes, challenges that are created by virtual collaboration (remote communication through digital tools, diversity, etc.).*

A second area for leadership research related to our review of research examining technology as a context examines leadership forms. Extant research on leadership in teams from the technology as context perspective suggests that team leadership benefits from sharing leadership among team members. Research on leadership forms in virtual teams suggests that distributing leadership across multiple members of the virtual team rather than a single member is a more effective and efficient leadership structure in many virtual team settings (Bell & Kozlowski, 2002). This is because placing all leadership responsibility on a single virtual team member requires more time and effort than your average face-to-face team due to the technological tools that must be used in order to complete typical leadership activities, such as motivation and direction-setting (Purvanova & Bono, 2009). In fact, multiple studies have observed that the inherent structures and collaborative tendencies within virtual teams cause leadership behaviors to emerge informally from a number of team members rather than from any officially appointed leader (Avolio, 1999; Carte, Chidambaram, & Becker, 2006; Charlier, Stewart, Greco, & Reeves, 2016; Yukl, 1998). The observation from these studies is that shared leadership is better than hierarchical leadership for helping virtual teams develop needed affective and cognitive states and enact team processes.

Leadership Implication #2. *Shared leadership forms are better than vertical forms for helping virtual teams develop functional affective and cognitive states and enact team processes.*

Technology as sociomaterial

A second body of work takes a different view of technology. Work that adopts a *technology as sociomaterial team practices* perspective considers the technology practices that teams develop as they encounter material aspects of digital technologies (Table 1). Technology practices come about when team members' intentions, a desire to do something, meet features of digital technologies, an ability to do something using a feature of technology. The earliest work on teams to reflect this technology perspective emerged from structuration which is a concept that “acknowledges the active role of human agency in social systems” (Poole & DeSanctis, 1992, p. 6). The idea of structuration evolved into the area of research examining *adaptive structuration theory*. Adaptive structuration theory is proposed as a “framework for studying variations in organization change that occur as advanced

technologies are used" (DeSanctis & Poole, 1994, p. 122). Adaptive structuration explains that a technology's features can serve very different functions to a team. Team members develop practices and use technologies in ways that meet their needs. The same team may use the same technology differently at different times as their needs change. Likewise, different teams might use the same technology in different ways. In this way, the sociomaterial perspective examines technology and teams as mutually dependent ensembles (Orlikowski, 2007) and leads us to explore "the development or use of materials and forms" in teams (Leonardi, 2012, p. 34).

The view of technology as mutually intertwined with social practices is often examined from a technology affordance perspective. The core idea of affordances originated from James Gibson's Gestalt psychology thinking that objects do not have inherent functions (Gibson, 1977); rather a function is what comes about when an individual realizes that an object can be used for something. It is neither the person nor the object, separately, that explains the pleasure of resting on a tree stump, rather it is the moment when the *tired* person sees the *flatness* of the stump and decides to sit. In this example, fatigue creates the person's motivation to rest and the stump's flatness is a material property that can enable rest. Flatness has *afforded* the weary hiker a means to rest. Though not always tactile, digital technologies nonetheless have properties that inspire uses as well. Many of these have been described and characterized as technology affordances.

Consider the *association affordance* (Treem & Leonardi, 2013). Many team processes require that team members form a mental understanding of who holds what viewpoint, who creates which products or ideas, or who supports or opposes whom. The team process of monitoring and backup behavior (Marks, Mathieu, & Zaccaro, 2001) implies that team members can observe one another's work and intervene when the work is subpar in order to ensure that team performance does not suffer. Many programmed features that are built into digital technologies afford team members the ability to make these associations. As an example, consider any project management software (e.g., Slack, Asana, Basecamp) that has members create a profile with their name and photo. When the member posts something, the post appears next to their name and photo. A team member who wants to go back and review what has been posted related to a particular deliverable could use the search function to see who has contributed what.

"An affordance perspective recognizes how the materiality of an object favors, shapes, or invites, and at the same time constrains, a set of specific uses" (Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007, p. 752). Zammuto and colleagues use the concept of affordances to "capture the interplay between IT and organization" to represent the idea that "new combinations of technology and organizational features continually create possibilities that affect organizational form and function" (p. 750). Zammuto et al. (2007) suggested five possible affordances offered by organizational technologies: work processes visualization, real-time product and service innovation, virtual collaboration, collaboration with many people at once, and virtual reality.

As an example of how the sociomaterial view considers the joint confluence of human intentions and material aspects of technology, consider a technology called Ambit. Ambit (Ambit, 2019) is a software tool that monitors team conversations in realtime and provides instant feedback on the percentage of air time captured by each team member during a discussion. This feature may serve as a shared leadership affordance, enabling the group to adjust and rebalance conversation to gain input from soft spoken members. Another group may see this information differently, instead using the tool to determine the deviant whose pattern of communication is blocking the passage of an important initiative. Importantly, the technology has features, but the way these features are perceived and appropriated by the team can vary widely.

With the exception of Poole and DeSanctis' adaptive structuration theory, work viewing technology from a sociomaterial lens proliferated in the 2000's alongside the spread of online communities (i.e., Barrett,

Oborn, & Orlikowski, 2016; Faraj, Jarvenpaa, & Majchrzak, 2011) and crowds (i.e., Orlikowski & Scott, 2015; Osterlund, Mugar, Jackson, Hassman, & Crowston, 2014). Online communities and crowds are interrelated terms. The former is used to describe a virtual space "where people come together with others to converse, or to exchange information or other resources" (Resnick & Kraut, 2011, p. 1). Organizational scholars exploring online communities study the shared identity that develops and connects members. Crowds, on the other hand, are more deliberative and closer to resembling work teams. Crowds include people who self-organize online around a common purpose; typically that purpose was "once performed by employees and is now outsourced to a network" of people through an "open call" for participation (Howe, 2006). Crowds often form within online communities. Online communities and crowds can form within traditional organizations or outside formal organizations. An example of the latter is InnoCentive (InnoCentive, 2019), an open innovation platform where organizations post challenges offering rewards to solvers who need not be employees of the sponsoring organization.

If we adopt a technology as sociomaterial view then we see the ways in which team leadership comes about and is enacted as team needs meet technological materiality. Leaders and team members have agency in determining how technologies are used to meet team needs. Research has explored the ways in which the "imbrication of humans and material agencies" (Leonardi, 2011, p. 147) can explain leadership functions and forms.

Research taking a sociomaterial view of technology has explored the ways in which leadership functions come about in tandem with material aspects of digital technologies (Oborn, Barrett, & Dawson, 2013). Studies have identified practices that meet affective team needs. For instance, in a study of three virtual investing-related communities, members with no formal role took on the role of *conflict mediators* "when a disagreement between two individuals became personal and destructive" (Gu, Konana, Rajagopalan, & Chen, 2007; Faraj et al., 2011, p. 1232). Members also stepped forward to motivate and direct the group. Though rarely the initiator of the idea, *idea champions* "ensure that the kernel of the idea was maintained and evolved through the discussion" (Kane, Majchrzak, Johnson, & Chen, 2009). A final example of how informal leadership is used to build affective attachment is *metavoicing*, which occurs when online community members react to one another's presence in the online community, their profile, contributed content, or other activities (Majchrzak, Faraj, Kane, & Azad, 2013).

Studies also suggest leaders help online communities and crowds to meet their cognitive process-related group needs. For example, qualitative studies observed the role of the *shaper* in an online community. The shaper is someone who helps to organize diverse contributions into a coherent message (Majchrzak et al., 2007; Yates, Wagner, & Majchrzak, 2010). The shaper self-nominates to take on the work of intellectually integrating contributions. Another leadership act aimed at team cognition is called *channeling participation*. Channeling participation occurs when members "create a narrative that helps keep fluid participants informed of the state of the knowledge, with this narrative having a necessary duality between a front narrative for general public consumption and a back narrative to air the differences and emotions created by the tensions" (Faraj et al., 2011, p. 1231).

Quite a few studies have explored leadership that behaviorally integrates team members' ideas and actions. One set of activities is labeled *engendering roles in the moment*. This occurs when observing "a perceived state of the community, coupled with a perceived self-efficacy that a particular contribution might be helpful to the community... These roles are not enacted because the participant is a member of a core group or asserts leadership authority...Instead, ... the participant appears to be enacting a self-defined role as a mediator, 'unmasker,' organizer, or supporter..." that sustains collaboration (Faraj et al., 2011, p. 1231). Another leadership act enabling behavioral integration in online communities is *dynamically changing boundaries*, a strategy

used by online community members to “discourage or encourage certain resources into and out of the communities at certain times” (Faraj et al., 2011, p. 1231).

Lastly, leaders in online communities enable adaptive behavioral responses among contributors. Members of online communities *evolve technology affordances* in ways that are embedded by, and become embedded into, iteratively enhanced social norms. “These iterations help the OC to socially and technically automate responses to tensions so that the community does not unravel” (Faraj et al., 2011, p. 1231). Evolving technology affordances is a strategy for teams to remain adaptive in response to changes.

Taken together, the work on leadership functions taking a socio-material view of technology suggests ways that features of technology can enable team members to lead the development of needed affective and cognitive team states and behavioral team processes. The key assumption about leading teams from this technology perspective is that material features of technology and behavioral intentions jointly create affordances for leading and collaborating in teams. The findings reviewed in this section can be summarized with the following leadership implication:

Leadership Implication #3. *Team leaders can shape technology practices in order to foster the development of functional affective and cognitive states and enactment of team processes.*

Research adopting a technology as sociomaterial perspective also speaks to the second dimension of team leadership: forms. DeSanctis and Poole (1994) pointed out that technology plays an important role in shaping team status hierarchies. Material aspects of technological tools can determine “the likelihood of leadership emerging when the technology is used, whether a leader is more likely or less likely to emerge, or whether there will be equal participation versus domination by some members” (p. 127).

Research on online communities and crowds emphasizes the importance of emergent, informal leadership that is often shared or rotated among community members. Leadership in online communities and crowds tends to shift among members, and leadership authority has been observed as “fleeting in such communities” (Faraj et al., 2011, p. 1231). In fact, online communities have even been seen as resisting formal leadership from those developing and maintaining the platforms (Brabham, 2008). Overall, the inherent structure of online communities and crowds lends to a more shared, informally emergent leadership structure in terms of the form in which leadership takes in such teaming types. These findings emphasize that technological affordances can affect the form of leadership that emerges in teams, and also the degree to which leadership is stable or fluid. This suggests the following leadership implication:

Leadership Implication #4. *Team technology practices can shape the emergence of team leadership structures, and the stability versus fluidity of team leadership structures.*

Technology as creation medium

A third area of research takes another perspective of technology. Work adopting a *technology as team creation medium* perspective explores the ways that technology platforms are shaping who forms teams and how they do it (Table 1). This research explicitly focuses on the role of technology in the initial formation and later reformation of teams through boundary management practices. The technology as creation medium perspective views technology as creating new opportunities for team leadership, expanding the ways leaders can lead teams. Studies conducted from a technology as creation medium perspective also mark a shift in thinking about technologies and teams insofar as studies illustrate ways that the technologies themselves can serve all or at least parts of the leadership role.

The context and sociomaterial perspectives have in common that

they both explain how technology meets traditional team leadership functions like supporting affective and cognitive states and team process behavior. The context view highlights ways that technology makes each of these team needs more pressing, requiring leaders to compensate for technology-induced challenges. The sociomaterial view explores technology practices in teams and suggests the kinds of practices that can provide needed leadership functions and the ways technology features shape team leadership forms. In the technology as creation medium perspective, the focus shifts to new leadership functions and leadership behaviors that are made possible with emerging technologies, and in some cases, to ways in which these functions can be accomplished by the technology as a leadership substitute. This perspective has flourished in the 21st century as the internet has become widely accessible to larger audiences around the world. The larger the population of internet users, the larger the pool becomes that could potentially contribute to projects created through technology that was not possible prior to the availability of large, diverse populations of potential contributors.

One group of studies on technology as a creation medium is work on peer production groups, the quintessential example being the teams who come together to curate pages in the online encyclopedia Wikipedia. *Peer production groups* are “large-scale, collaborative and primarily voluntary models of production in some of the most innovative and competitive sectors of information and technology” (Algan, Benkler, Fuster Morell, & Hergueux, 2013, p. 2). Some examples of peer production groups include open source software teams who rapidly self-assemble online in response to bugs in computer code (Crowston & Howison, 2006), citizen science teams who self-assemble to help classify and label stars in the galaxy (Iacovides, Jennett, Cornish-Trestrail, & Cox, 2013), and open innovation teams, where “people from different organizations work together to develop new products, services, or markets” (Du Chatenier, Versteegen, Biemans, Mulder, & Omta, 2009, p. 350). Most of the pages on the online encyclopedia Wikipedia.com are written and maintained by a fluid core team of individuals who monitor and update the content. Peer production groups, like those managing Wikipedia articles (Giles, 2005), consist of individuals who come together to “harness the collaborative efforts of many individuals in order to create artifacts of lasting value” (Kittur, Pendleton, & Kraut, 2009). In peer production examples such as the creation and maintenance of the online open encyclopedia Wikipedia or the Linux operating system (Weber, 2004), individuals voluntarily join a cause or project because of some intrinsic value of the project toward that person (Raymond, 1999). Team collaboration processes among the groups working on the peer production project are not organized in any particular way and are often only acknowledged through peer production-related forums or chat boards.

Another group of studies comes from work on flash teams. Flash teams come together on portals like Upwork.com that allow individuals to lead the formation and maintenance of a team of experts to accomplish specific goals. Upwork is a marketplace for professional workers that allows individuals to rapidly hire experts and supports their collaboration to accomplish a defined task. Flash teams provide a technological “framework for dynamically assembling and managing paid experts from the crowd” (Retelny et al., 2014, p. 75). For example, one might decide to convene a “flash team” using the software platform Upwork (Retelny, Bernstein, & Valentine, 2017). Flash teams provide an effective way to accomplish a variety of tasks ranging from creative design to engineering projects (Retelny et al., 2014). Individuals who participate in these teams have specialized skills and see new opportunities for flexible work on their own terms without a formal connection to traditional organizations. In these types of groups, individuals have the choice to opt in to or out of projects based on their own best interests.

The third set of studies in this subdomain explores team formation systems. These studies use digital platforms to create teams, albeit in very different ways. There are a variety of specific technologies, for

example Huddler or MyDreamTeam, that allow teams to self-organize online based on algorithms that recommend teammates to one another. With peer-production teams it is the platform that lays out the work, and then teams form organically based on mutual attraction to the work itself. With flash teams, a leader uses a platform to design the work and then chooses a set of paid experts to carry out the work. The leader of the flash team is designing the team. In contrast to the way teams form with peer-production or flash team platforms, with team formation systems members self-organize, but it's not the attraction to the work that brings them together. It is the attraction to each other.

As an example of this distinction, on Wikipedia a peer-production team came together to curate the page on "Florentine Painting" because of their shared expertise and interest in accurately conveying the most notable painters, paintings, techniques, and influences on Florentine painting. The team formed because its members were all drawn to the same task. In contrast, those who join teams in team formation systems do so on the basis of personal bases of attraction. They choose who to work with, and the task follows. One example of a team formation system is the online tool *Huddler* that "utilizes a dynamic programming algorithm to optimize for highly familiar teammates" (Salehi, McCabe, Valentine, & Bernstein, 2017, p. 1700). Another is a tool called *MyDreamTeam* (Gomez-Zara et al., 2019) which is an online searchable tool where those joining project teams can run queries to search for teammates matching those of their ideal teammates. All of these studies explore new leadership capabilities invited by technologies.

If we adopt a technology as a team creation medium perspective, then we see the ways that technology is expanding the purview of team leadership. Research from this perspective has taken as a starting point the introduction of a new technology, and then investigated the ways the technology creates leadership needs that take effect during the process of team formation, and then as the team develops and needs to reconfigure itself. As we review research on technology as a creation medium, we see how this genre of work invites leadership researchers to expand the functional lens to place greater emphasis on leadership during team formation. Work in this area expands the focus of leadership, illustrating ways that leadership dynamics are set in motion during the team formation process aided by digital platforms. To illustrate this point, consider the leadership processes involved in online peer production teams.

The leadership that occurs within peer production teams is self-governing. There is often a person or group of people who act as administrators ensuring that the technical infrastructure is set up and maintained (Butler, Sproull, Kiesler, & Kraut, 2002). Besides the one layer of leadership defined by the platform's organizational structure, the bulk of the leadership in peer production is emergent. Many of the active contributors of peer production teams, who are the individuals who do the bulk of the content creation in a platform like Wikipedia, are also often identified as taking on a leadership role and are often not compensated for their work (Zhu, Kraut, & Kittur, 2012, 2013). As peer production is a voluntary activity, team leaders must find non-monetary ways to motivate others to contribute. This means leaders must provide intrinsic rewards for contributors such as creating a community that contributors can embed themselves within and derive meaning from (Deaux & Stark, 1996; Penner & Finkelstein, 1998). Recruiting members to the team and erecting a meaningful boundary that serves as a basis for positive social categorizations is especially important in these groups that form outside of any formal organizational structure.

From a leadership perspective, these teams are formed by those with project needs or vision, or workers can join a pre-existing cause, started and maintained by individuals they may never meet in person. In these situations, many of the leadership processes are occurring before team members even join the team. Leadership involves recruiting team members, monitoring progress, and determining when new members need to be added or existing members disenfranchised.

Research taking a technology as creation medium perspective has explored the ways in which traditional and emerging leadership

functions are carried out in online platforms. Starting with the traditional function of meeting team affective needs, a number of studies have explored how technologies can play a role in meeting the leadership needs of teams as they form. These studies do not study how team leaders use technology (sociomaterial perspective) or are affected by technology (context perspective), but rather, investigate a new function of forming teams, and some studies reflect a technology performing the leadership function even without the awareness of the team. For example, Salehi et al. (2017) show that their tool *Huddler* enables teams with greater familiarity to form faster than they can without the tool and that familiarity doubles the performance of crowd worker teams. Another example is work done by Luther and Bruckman (2008) which observes that one of the functions of leaders in online creative collaboration is to design a collaborative project for the team to form around.

In a set of studies wherein digital technology oversees a *team dating* process, team members work with the technology to form teams (Curseu, Kenis, Raab, & Brandes, 2010). Team dating uses a technology to allow people to meet a variety of potential teammates quickly for short encounters, rating them, and then being matched with higher-rated teammates. Another study demonstrates how technology can take on leadership functions using a personality matching algorithm (Lykourentzou, Antoniou, Naudet, & Dow, 2016). The technology used an algorithm to form teams with balanced personality types. Crowd worker teams whose members have different personality types experienced less conflict and greater satisfaction than more homogenous teams. Interestingly, when given a choice of being matched based on their own ratings or the average ratings of people provided by everyone participating, people prefer their own ratings (Lykourentzou, Kraut, & Dow, 2017; Lykourentzou, Wang, Kraut, & Dow, 2016). Although not explicitly labeled team dating, other researchers have investigated the use of a community-wide deliberation process prior to team formation, and researchers found that this process prior to team formation resulted in higher team performance after team formation (Wen, Maki, Dow, Herbsleb, & Rose, 2017).

Also on the topic of leading team affect, it is interesting to note that a set of platforms is cropping up to allow individuals who work in paid crowdsourcing environments and on peer-production and flash teams to discuss their experiences and rate the "employers". Four of them supporting the Amazon Mechanical Turk workforce are: TurkerNation, MTurk Forum, MTurkGrind, and MTurk Crowd. Workers come here to decide which projects to participate in and which to avoid (LaPlante, Silberman, & Metall, 2016). Although crowdsourcing research often takes a technology as sociomaterial view, the work on these kinds of groups pre-formation falls within our technology as creation medium perspective, since this work examines the groups and technology before and as they are being created rather than after they are created. For individuals who regularly organize and lead flash teams, these forums provide an important source of reputational capital that affects their ability to lead projects by attracting top talent in the future.

Research taking a technology as creation medium view has also explored the ways in which technologies play a role in supporting team cognition as teams form. Specifically, research on crowd teams has examined the role of technology in team cognition such as team familiarity, mental scaffolding, and collective intelligence. Overall, leadership functions have also been preliminarily found to affect team cognitive processes. For example, crowd teams high in interpersonal familiarity have been shown to outperform crowd teams low in interpersonal familiarity, which is believed to be because of team cognition (Salehi et al., 2017). Also, differences in expertise levels can impede crowd workers' collaborative effectiveness. Specifically, a crowd worker team's use of modifiable shared artifacts to scaffold ideas between team members and crowd workers was shown to improve collaboration (Lee et al., 2018). Research has found that peer production group members use other's history of project activity to form impressions of other's expertise (Marlow, Dabbish, & Herbsleb, 2013). An expert leader in a

crowd worker team can also be helpful in leading non-experts to successfully accomplish data analysis tasks (Feldman, Anastasiou, & Bernstein, 2018). Finally, collective intelligence systems can help organizations to create optimal teams from crowds to fit specific organizational needs (Malone, Laubacher, & Dellarocas, 2010). Together, these results suggest preliminary evidence for the role of leader behaviors influencing team cognitive processes in teams using technology as a creation medium. In crowd worker teams and peer production teams, leaders must be particularly careful about clarifying team boundaries so that team members can form productive cognitive models about one another.

Research taking a technology as creation medium view has also explored the ways in which technologies play a role in supporting team behavioral processes as teams form. In order to illustrate what we mean by this, consider a flash team. When a leader decides to create a flash team, and recruit team members to join, the leader designs a workflow in the platform. Creating *workflows* in flash teams is the act of dividing up crowdsourcing jobs into smaller tasks. The workflow largely dictates who communicates with whom in the course of coordinating the work. Once the leader determines the workflow, the technology largely governs team behavioral processes; team interactions travel where the tracks were laid down by the flash team leader and then are continually reinforced by the technology. Research finds these workflows provide a useful coordination artifact, but also prevent team members from being able to adapt personal work plans when needed (Retelny et al., 2017).

Taken together, the work on leadership functions taking a creation medium view of technology suggests unique ways that technologies are shaping team formation within and outside formal organizations. These technologies shape who comes together in teams in the first place or at all, and also sets team dynamics in motion. The key assumption about leading teams from this technology perspective is that team leaders can leverage technologies during the team formation stage to foster the development and maintenance of needed team states and process. As such, we summarize the following leadership implication supported by our review of this work.

Leadership Implication #5. *Team leaders can use team formation technologies in order to foster the development of functional affective and cognitive states and enactment of team processes.*

In reviewing these studies, we note a key shift in thinking about leadership that needs to be mentioned. Most of these studies look at how team members can use technologies during team formation. The idea being that how individuals use technology during team formation can be pivotal in supporting teamwork later on. Other studies look at how the technology can be programmed in such a way as to take the team members out of the leadership loop during team formation. These studies move toward using the technology in team formation as an alternative or substitute for leadership. As a case in point, Huddler (Salehi et al., 2017) and related studies (i.e., Rahman, Roy, Thirumuruganathan, Amer-Yahia, & Das, 2018) in the genre seek to codify into an algorithm the choices and actions of team leadership during the team formation process. Based on this, we summarize the following additional leadership implication that arises from the technology as creation medium perspective:

Leadership Implication #6. *Digital technologies used during team formation can serve a team leadership role by fostering the development of functional affective and cognitive states and enactment of team processes.*

Not only does the creation medium perspective have implications for leadership of the most commonly studied teamwork states and processes, but research conducted with this view in mind suggest additional leadership functions as well. Boundary work has long been an important aspect of team leadership and presents as particularly critical to leading wherein technology is a creation medium. A boundary defines who is on a team and who is not (Hackman, 2012). Examples of boundaries that may be drawn in organizations are vertical boundaries,

horizontal boundaries, demographic boundaries, and geographic boundaries (Yip, Ernst, & Campbell, 2011). Vertical boundaries occur across levels of hierarchy whereas horizontal boundaries occur across function or expertise level. Demographic boundaries occur across group diversities such as gender, age, or cultural background, and geographic boundaries occur between those located in different locations. Boundaries provide teams with needed entitativity, a perception of group similarity and interconnectedness (Campbell, 1958; Gaertner & Schopler, 1998). Hackman (2012) suggests that “real teams” require boundaries that distinguish those on the team from those who are not. Meaningful boundaries serve as a basis for positive social categorization processes, define ingroups and outgroups, and inspire, motivate, and promote collaboration within boundaries (Arrow & McGrath, 1995; Ernst & Yip, 2009; Lau & Murnighan, 2005).

Technological advances raise the importance of boundary management work in technologically-enabled environments, but also the challenges of dynamic boundary management work in such contexts (Hwang, Singh, & Argote, 2015; Mortenson & Haas, 2018). Team boundary spanning, or team boundary management, is “a team’s efforts to establish and manage external linkages” that can occur within and between teams and organizations (Marrone, 2010). We adapt the classic definition of team boundary management for a technologically-enabled definition that better suits the boundary complexities that leaders face within teams that use technology as a creation medium, like flash teams or peer production groups. In these teams that form entirely through online platforms, leader boundary management will be critical to gaining participation, creating functional norms, and sustaining member motivation to contribute to the team.

Research taking a technology as creation medium view has uncovered a new leadership function needed by teams in informal online environments. With flash teams, the team leaders need to continuously reevaluate who stays on the team. The fluidity of flash teams requires teams to balance conflict with cohesion, constantly defining and redefining the boundary of the collective project in order to socialize newcomers and extradite members who no longer advance the shared vision (Luther, Fiesler, & Bruckman, 2013).

Team boundaries, or a lack of clear team boundaries, is especially salient in teams in which technology is being utilized as a creation medium. To give some context, the bulk of work contributed in peer production communities, such as a Wikipedia page, is typically completed by a small group of contributors who claim leadership in creating that particular page (Kittur & Kraut, 2008, 2010). However, unlike in a typical organization, there are no organizational or hierarchical structures in place to guide contributors in who leads whom. Technically, in an open-source, peer production project, anyone can contribute to the project. How does the core of contributors regulate the creation and quality of output on the page? The core group of contributors must navigate the fluid boundaries of the peer production project through whatever means of communication and coordination are available to them in the platform. These forms of organizing are also increasingly being used inside formal organizations in open innovation projects (Chesbrough & Appleyard, 2007). Although team-boundary spanning is a well-known leadership behavior, what do leaders do when there is a clear lack of boundaries to span? Setting up and managing team boundaries through effective leader boundary management is critical to the overall performance and viability of those working in the peer production group. Fluid boundaries are a particular challenge for leaders of teams using technology as a creation medium. Based on this work emphasizing the increasing challenges related to boundary management, we suggest the following leadership implication:

Leadership Implication #7. *Team leaders can use team formation technologies to manage team boundaries both during team formation, determining who's on the team, and also during subsequent team phases through the periodic reevaluation of team membership.*

Not only are digital technologies playing a role in team leadership functions, they are also shaping the form leadership takes on in the team. Distributed leadership is where multiple team members take part in leading the team (Gronn, 2008; Thorpe, Gold, & Lawler, 2011), and was examined in flash teams using a tool called *Pipeline* (Luther et al., 2013). Pipeline was designed to “support and transform leadership, with the goal of easing the burden on leaders of online creative projects” (Luther et al., 2013). The *Pipeline* tool “redistributes” leadership to spread the burden of leadership across multiple team members, which was theorized to improve team effectiveness. Another study on leadership forms in Wikipedia finds strong evidence for the presence of shared leadership among the online encyclopedia groups (Zhu, Kraut, Wang, & Kittur, 2011). Studies like these show how a digital technology can shape the leadership form that comes about. Other studies show how individuals’ behavior with these technologies can shape their own fate as team leaders.

As a case in point, studies using the *MyDreamTeam* (Gomez-Zara et al., 2019) tool found significant disparities in the number of team invitations individuals sent out. This disparity was important because the study also found that being central in the team invitation network, i.e., being the one who invites everyone to the team, predicted leader emergence once the team began to work together (Twyman, 2019). Hence, those who are most active in using technologies to assemble teams may also have an outsized role in leading them once formed.

Reflecting the technology as team creation medium lens, these studies find consequential leadership dynamics are playing out in online digital platforms as teams are forming and are shaping the leadership functions and forms involved in teamwork later on. The studies of tools like Pipeline highlight the ways digital tools are shaping leadership structures in teams. Studies like Twyman (2019) show actions taken during team formation can shape team leadership emergence later on as the team executes taskwork. Accordingly, we note the following leadership implications that relate to team leadership forms:

Leadership Implication #8. *Digital technologies can shape the leadership structures that emerge in teams.*

Leadership Implication #9. *Team members actions and interactions during team formation within digital technologies can play a role in who emerges as a team leader.*

Technology as a teammate

The fourth area of research takes yet another perspective of technology. Work adopting a *technology as teammate* perspective explores the ways that digital technologies are advancing to the point of fulfilling a distinct role on the team (Table 1). As the long history of work on digital technologies and teams clearly suggests, technologies have long been important to teams. The role of technology in the other three perspectives has been to understand how technology affects teamwork. In the context view, it constrains teamwork. In the sociomaterial view, it gives rise to work practices. In the creation medium view, it creates new opportunities to lead during the formation process. In the teammate view, technology is not viewed as it constrains or augments what team members are doing, technology is viewed as a motivated social being operating as a co-equal member of the team.

We are quickly approaching a time when digital technologies are as agentic as are human counterparts. Historically, humans have worked alongside machines in many forms, such as in automobile assembly lines or cracking codes in World War 2. Today, many airplanes have an autopiloting system consisting of code that works as a teammate alongside human pilots. The future promises even more automation in our day-to-day lives with innovations in autonomous transportation, like self-driving Ubers and autonomous ground transportation. Moreover, autonomous agents will become more embedded in organizational life, as organizations begin to use AI in nearly every corner of

their organizations, from human resources (Bokelberg et al., 2017), selection (Strohmeier & Piazza, 2015) and training (Taylor, 2017), to steering and investment decisions (Strier, 2017).

The extant literature on leadership in teams has focused on leadership of teams of humans. However, as we just listed in the previous paragraph, technology is becoming increasingly prevalent within our teams, taking on team roles and functions that used to be occupied by humans (Bourton, Lavoie, & Vogel, 2018; Nass, Fogg, & Moon, 1996). Important work in the human-computer interaction literature has started to push the boundaries of this work to not only think about the best possible design of technologies for human use, but also consideration of how to create technologies that can best take on team roles or functions so that they can also collaborate well with their human teammates (Ajoudani et al., 2018; Breazeal, Kidd, Thomaz, Hoffman, & Berlin, 2005; Groom & Nass, 2007). In contrast to our previous perspectives wherein technology was being used by humans or augmenting human behavior, our review of the literature invites us to acknowledge a new perspective on leadership and technology: technology as a teammate.

Although clearly relevant to organizational scholars, work examining technology as a teammate has primarily lived in areas other than organizational behavior. Kellogg, Valentine, and Christin (2019) proclaim “organizational scholarship has not kept pace with the ways that algorithmic technologies have the potential to transform organizational control in profound ways, with significant implications for workers” (p. 2). Thus, we find much of the work on technology as teammate originating from the area of human-computer interaction and other technology-related areas, rather than in the organization sciences. Human-robot teams have been the subject of study in these areas for much of the 20th century in the form of assembly line teams, for example. Although the study of the interaction between humans and robots is not new, only within the past decade or so has the scholarly research been able to actually study human interaction with intelligent agents. This is due to the fact that the intelligent technologies have only recently become “intelligent”, with the creation of artificially intelligent agents such as IBM’s Watson. Thus, the human-AI team has only come about in the 21st century.

At this point, it is useful to distinguish the terms agent, technology, robot, and AI. DeCostanza et al. (2018) distinguish a *technology* from an *agent* when it comes to teams: “we reserve the term technology for those devices, software, protocols, and other interventions that target the members of the team with the goal of improving team processes. It is entirely possible that a technology will also be a team member, which we refer to as an agent. We use the term technology when referring to its role as assisting in team performance as opposed to satisfying its role in the team” (DeCostanza et al., 2018, p. 4). A robot can be either a technology or an agent, depending on its role in the team. If the robot merely augments a human, making no unique contributions to the team apart from making a human more effective, then it is a technology. If, on the other hand, the robot is a team member fulfilling a distinct role in the team and making a unique contribution to performance, then it is an agent. For the purposes of our review, we use the term robot to refer to the latter meaning, where robots are a type of agent, serving as a member of the team. Thus, the perspective of technology as teammate deals with technology that acts as an agent, not just a technology.

Next, it is necessary to distinguish the difference between robots and AI to better define human-robot teams from human-AI teams. *Robots* are embodied agents with physical features roughly resembling human characteristics. Not all agents are embodied, and disembodied computational systems can also be a teammate, which introduces the notion of Artificial Intelligence (AI) to teams. *AI* is defined as the use of a computer to “perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages” (Artificial intelligence, 2019). The most critical aspect of this definition being “tasks normally requiring human intelligence,” since this distinguishes AI from automation which also

involves technology performing human tasks, but typically more behavioral tasks. We use the term agent in human-agent teams to refer to cases where a technology serves as a team member broadly. This umbrella term then captures two types of human-agent teams: human-robot teams and human-AI teams. The primary distinction between the two being the physical embodiment of the robot. Both are computerized, employ computational algorithms, and occupy a role on the team. However, the robot is physically embodied while the AI teammate is not. The distinction is useful because prior work on robot embodiment is important for leading human-robot teams, but not for leading human-AI teams.

Human-robot teams are composed of humans and embodied intelligent agents working interdependently in pursuit of a common goal (DeCostanza et al., 2018). Human-robot teams include teams of humans and robots working on assembly lines together and teams of human cooks and touch screens working as order-takers in a fast food restaurant. Human-AI teams are composed of humans and disembodied intelligent agents working interdependently in pursuit of a common goal (DeCostanza et al., 2018; Wilson & Daugherty, 2018). Examples of AI include machine learning or deep learning computational techniques used in the corporate world to predict market changes or human behavior (Pyle & San Jose, 2015; Wellers, Elliott, & Noga, 2017). Machine learning algorithms "detect patterns and learn how to make predictions and recommendations by processing data and experiences, rather than by receiving explicit programming instruction" (Chui, Kamalnath, & McCarthy, 2018). One could imagine AI being used in teams to run risk-analyses for team decisions or help with retaining and sharing relevant team information (Wilson & Daugherty, 2018).

Extant research on humans working in teams with agents is still in its infancy, but one major point stressed in the extant literature on the topic is that human-agent teaming of the future will present a range of challenges (Chakraborti, Kambhampati, Scheutz, & Zhang, 2017; Talamadupula, Briggs, Chakraborti, Scheutz, & Kambhampati, 2014). Humans have been working alongside some form of automation for decades, and there have obviously been leaders of such teams. However, in the past, a leader's consideration of such technologies was to ensure that there was a person on the team that was equipped to manage or operate the technology and to step in if something malfunctioned. However, we are now moving into a new era of robotics and automation where agents are taking on more advanced executive functions, like choosing the team, providing feedback on team processes, or intervening to stimulate controversy over team decisions.

Though more nascent than the other three perspectives, this perspective represents one of the most exciting new frontiers for team leadership research. Though there are far fewer studies, particularly empirical ones to summarize in this domain, we synthesize existing conceptual perspectives with the lens applied thus far in our review in order to outline three leadership implications suggested by this early thinking on technology as teammate.

A first set of thinking in this area relates to affective and cognitive leadership needs. A major issue in human-agent teamwork is getting humans and technology to have productive affective processes. Researchers have begun to investigate issues like trust in human-robot interaction (Billings, Schaefer, Chen, & Hancock, 2012; Freedy, de Visser, Weltman, & Coeyman, 2007; Lee & See, 2004). In particular, research has found that humans' trust in robots was highly dependent on the robot's performance and perceived competence (Hancock et al., 2011). Another study found that team members preferred to cede control to a robot rather than a human teammate (Gombolay, Gutierrez, Clarke, Sturla, & Shah, 2015). Teams have also been shown to perform better when they were emotionally attached to a robot teammate (You & Robert, 2018). Researchers have even looked into anxiety detecting systems in human-robot collaboration (Rani, Sarkar, Smith, & Kirby, 2004). However, little empirical research has been done on a leader's considerations in leading teams with modern-day robotics working alongside human teammates.

This research suggests that leaders must not only manage the interaction between humans and robots, but they must also consider the way introducing robots to teams might change human-human relationships (Jung, 2017; Jung & Hinds, 2018). Introducing robots to social settings has been found to shape the interactions that occur among humans. For example, in a study introducing a snack delivery robot to the workplace, employees were later found to be more polite because they were paying close attention to how one another was treating the robot (Lee, Kiesler, Forlizzi, & Rybski, 2012). Another example is research examining the ability of a robot teammate to mend team conflicts. Researchers had the robot interject with statements like: "Dude, what the heck! Let stay positive" (Table 2, p. 232). The study found that robots using conflict repairing strategies were able to influence human-human conflict interactions (Jung, Martelaro, & Hinds, 2015).

Research also highlights the leadership need related to team cognition. One obstacle acknowledged in expert reports is that a leader's job is to help team members better understand the technology (McAfee, Brynjolfsson, Goldbloom, & Howard, 2014, September). Experts claim that human-robot teaming of the future will be primarily more of a cognitively intensive challenge rather than a physical challenge because of the implicit expectations that humans have of their teammates, whether they are human or otherwise (Chakraborti et al., 2017; Hoffman, 2013). Related to cognitive team processes, a leader's job is two-fold. First, leaders are and will continue to be pivotal in the development of productive teaming with intelligent agents. An extensive knowledge of teamwork and human interaction is crucial for designing technologies that work well with human team members. On the other hand, leaders must be able to help human team members adopt new technology teammates, including understanding the role of the technology and how the technology is preprogrammed to perform that role on the team.

Taken together, early work on leadership functions taking a technology as teammate view emphasizes the need for leadership to develop functional affective and cognitive states. Interestingly, these states have two foci: the interface between humans and machines, and the interface among human teammates who are working in the presence of machines. The key assumption about leading teams from this technology perspective is that the addition of intelligent machines as full-fledged team members with their own programmed and evolving motivations creates a leadership need of facilitating productive relationships among human and synthetic team members. The findings reviewed in this section can be summarized with the following leadership implication:

Leadership Implication #10. *Team leaders need to foster functional affective and cognitive states and behavioral processes among human and synthetic team members so that human-agent teams can perform effectively.*

Adding intelligent machines as teammates creates additional leadership needs. AI is quickly becoming a source of competitive advantage across industries and levels of organizations, and many industrious organizational leaders are driving this trend. However, there are limits to the technology. The C-Suites of major technology firms - Amazon, Google, Apple, and Netflix, to name a few - routinely leverage AI, often in the form of machine learning, to help with pattern recognition and analysis to make organizational steering decisions (Pyle & San Jose, 2015). Rather than human-created rules that are pre-programmed into the algorithm, machine learning generates algorithms from data. These approaches first train on massive data sets, creating rules from patterns in the data set and are then refined through an iterative process of applying the rules to data, learning, adjusting rules, and so forth. Organizations are beginning to rely on such algorithms in order to steer decision making processes, but there are limits. One major theme of concerns for leaders in using AI is the ethics behind the technology. Some ethical considerations come from the data that is used to train the algorithms. The data used in training and making

Table 3

Summary of leadership implications stemming from four technology perspectives.

Technology as team context

Leadership Implication #1. Team leaders need to compensate for the challenges that virtual teams face in developing functional affective and cognitive states and enacting team processes, challenges that are created by virtual collaboration (remote communication through digital tools, diversity, etc.).

Leadership Implication #2. Shared leadership forms are better than vertical forms for helping virtual teams develop functional affective and cognitive states and enact team processes.

Technology as sociomaterial team practices

Leadership Implication #3. Team leaders can shape technology practices in order to foster the development of functional affective and cognitive states and enactment of team processes.

Leadership Implication #4. Team technology practices can shape the emergence of team leadership structures, and the stability versus fluidity of team leadership structures.

Technology as team creation medium

Leadership Implication #5. Team leaders can use team formation technologies in order to foster the development of functional affective and cognitive states and enactment of team processes.

Leadership Implication #6. Digital technologies used during team formation can serve a team leadership role by fostering the development of functional affective and cognitive states and enactment of team processes.

Leadership Implication #7. Team leaders can use team formation technologies to manage team boundaries both during team formation, determining who's on the team, and also during subsequent team phases through the periodic reevaluation of team membership.

Leadership Implication #8. Digital technologies can shape the leadership structures that emerge in teams.

Leadership Implication #9. Team members' actions and interactions during team formation within digital technologies can play a role in who emerges as a team leader.

Technology as a teammate

Leadership Implication #10. Team leaders need to foster functional affective and cognitive states and behavioral processes among human and synthetic team members so that human-agent teams can perform effectively.

Leadership Implication #11. Team leaders need to ensure that team members have a shared understanding of the limits of technology and when control needs to be taken back by human team members.

Leadership Implication #12. Team members' interactions with synthetic teammates can play a role in shaping who emerges as a leader, and the overall leadership structure that emerges in human-agent teams.

predictions might come from a data set that is biased, misinforming the team. Until ethical standards are developed at an industry level, leaders must decide how to navigate the ethical questions of AI.

Leaders must navigate their human team members' acceptance of the technology used as teammate. The leader must learn about and stay up to date on the constant innovations occurring in the technology as well as clearly communicate the technology and its capabilities to the humans on the team in order to build team efficacy and trust around the technology. Furthermore, the leader must communicate the necessary pieces of information about the technology acting as teammate so that humans understand the strengths and limitations of the technology. Artificially intelligent machines tend to not advertise their limitations, so is an important responsibility for team leaders. One example where this mutual understanding of the technology's limitations is critical can be seen in the Boeing 737-Max crashes in early 2019 (Beech & Suhartono, 2019). Pilots in these incidents were unaware of the limitations of a new update in the navigation systems, so the pilots did not know to take control from the navigation system at the appropriate time. Although an extreme example, the Boeing 737-Max incidents underscore the importance of having everyone on the same page, both humans and technologies. A leader's intricate knowledge of all teammates, human and otherwise, is critical in teams wherein technology is perceived as a teammate.

Leadership Implication #11. Team leaders need to ensure that team members have a shared understanding of the limits of technology and when control needs to be taken back by human team members.

Not only does the prospect of synthetic teammates shape needed

team leadership functions, it also has important implications for leadership forms. Several studies find humans appreciate ceding some leadership responsibility over to robots. In a study by Gombolay and colleagues mentioned earlier, human team members preferred to cede control to the robot as compared to a human teammate. This has implications for shared leadership more generally. If humans prefer sharing leadership with technologies, this may make it more difficult for humans to share leadership with one another. Also speaking to this issue is work by Lee et al. (2012) on a study of the snackbot robot that brought snacks to offices over a period of 4 months. This employee's quote is telling about how bonds between humans and robots can later spill into human relationships: "One time I told Snackbot-I think Snackbot asked me if there was maybe a tour of [building] or something, which room should Snackbot take me up to, and I just told Snackbot that probably someone would program it. It's a robot. It's probably not going to make those choices. And then my office mate was like, 'Oh. Now you've gone and made Snackbot feel bad.' So I think part of it is about how my relationship with Snackbot is not just about Snackbot but about other people who are around and kind of see us" (Lee et al., 2012, p. 700). When human relationships are shaped in part by how humans relate to technology, we would expect these interactions to shape leadership emergence in teams. Those whose interactions are more positive toward and effective in interacting with technological teammates (robots or algorithms) are themselves likely to be seen as more capable leaders. This leads to our final leadership implication:

Leadership Implication #12. Team members' interactions with synthetic teammates can play a role in shaping who emerges as a leader, and the overall leadership structure that emerges in human-agent teams.

Discussion

In reviewing the research on teams using digital technologies, we distinguished four perspectives on technology that were not labeled as such, but at closer inspection suggest the authors adopted somewhat differing assumptions about the role of technology in teamwork. Then, as we summarized the findings from each view using the two dimensions of leadership, functions and forms, we identified a set of leadership implications that arise from each perspective. Some of these implications are close to those found in other reviews, particularly those in the technology as context domain, but others offer exciting new directions for team leadership research. In this closing section, we highlight the novel implications suggested by our review and the future directions they imply for the research and practice of leading teams.

New directions for leading teams in the digital age

In reviewing research on team leadership from a technology vantage point, we identified twelve leadership implications suggested from this work. As we look across the leadership implications arising from these perspectives, summarized in Table 3, we would like to highlight three opportunities ripe for future leadership theory and research. These include: (1) leading technology practices, (2) leading teams across an expanded set of functions, and (3) collaboratively leading teams along with technology.

The first new direction suggested by our review is increased attention to the various ways team leaders shape technology practices. A leadership function discussed above and brought about by new technologies is that leaders must be aware that they help create team context and shape how teams utilize various types of technology, a process called *team technology appropriation*. This particular leadership function applies in particular to leaders in online communities/crowds, peer production groups, and flash teams. For example, Wikipedia, the peer-produced online encyclopedia, was founded by Jimmy Wales, who was the first leader within the Wikipedia platform. As such, Jimmy Wales created context and helped to shape team technology

appropriation at the beginning of Wikipedia's life. Once Wikipedia shifted to a more democratically-run system, Wikipedia page editors in good standing could run for positions in Wikipedia administration (Wikipedia contributors, 2019, October 7). Today, Wikipedia is led by decisions made by those elected administrators. On a more micro-level, there are page editors who take responsibility for certain pages or topic areas. Both administrators and page editors alike now decide how to move forward with the context and technology appropriation, such as with the formation and use of comment sections within Wikipedia through which editors may communicate.

The second new direction suggested by our review is an expanded set of leadership functions. Specifically, our review suggests that leadership actually begins before a team even forms. Our review took us into the team formation literature and brought up a few implications of leadership responsibilities in team formation. Another new function from the technology as teammate perspective is the need for team leaders to ensure that team members hold a shared understanding of when authority that has been shared with synthetic teammates needs to shift to human teammates. Issues of control get to the heart of how humans and autonomous agents interact. *Control* is the basic mechanism by which human team members monitor AI at key points in time, with the ability to intervene if deemed necessary. In thinking about how leaders manage AI-control, the concept of a team interaction mental model is useful (Lim & Klein, 2006). A team interaction mental model is a mental representation among team members about how members interact in performing taskwork. Leading teams with synthetic teammates will require the development of effective human-agent interaction models. These mental representations will need to be shared by human teammates and programmed into the AI by technology developers that ensure control mechanisms that are clear to all team members, human and synthetic.

The third new direction suggested by our review is collaboratively leading teams along with technology. This direction came out of the technology as team creation medium perspective when we found studies designing algorithms that would essentially take over the team leader's role in staffing. We also saw this suggested in the technology as teammate domain when robots were given control of task allocation processes (Gombolay et al., 2015) or programmed to diffuse interpersonal tension (Jung et al., 2015). Discussions of how AI will affect managers often focus on two things: 1) AI can reduce the amount of time leaders spend doing administrative work, and 2) AI will take on more and higher level decision making (Kolbjørnsrud, Amico, & Thomas, 2016; Parry, Cohen, & Bhattacharya, 2016). As advances in AI render intelligent agents better able to take on much of the direct administration, scheduling, and coordinating work in teams, human leaders can be more effective to the extent that they develop ways to share this work with their synthetic teammates. Similarly, as deep learning algorithms prove their value in making important decisions, leaders can work alongside these algorithms, adding their distinctive expertise on social and interpersonal issues that need to be considered in tandem with algorithmic judgement. The notion of ceding some responsibility for leadership of team formation to intelligent machines opens up a new research direction. What are the different forms of sharing leadership with intelligent machines? Which aspects of leadership are team members more and less willing to share with synthetic teammates? And in terms of performance, which structures best promote effective teamwork in human-agent teams?

These three themes apparent from examining team leadership from a technology perspective suggest new and interesting directions for leading teams. New sets of leadership activities come about when we focus on sociomaterial practices or technology as a creation medium. New sets of functions come about when we probe the technology as creation medium or technology as teammate perspectives. Lastly, from the technology as creation medium and technology as teammate vistas, we are invited to consider the ways leadership can be effectively shared between human and synthetic teammates. Whereas the preceding

discussion highlights new directions for leading teams revealed by our review, it is also important to point out the enduring aspects of team leadership.

Enduring aspects of leading teams

Across the four perspectives, functional aspects of team leadership are as important as ever for supporting teamwork across the many technology-enabled teams explored in our review. Leadership activities that promote the emergence of affective states in teams came up as important across areas. Trust was a common need across studies viewing technology as a context (Gilson et al., 2015; Joshi et al., 2009; Tyran et al., 2003), as a creation medium (Luther et al., 2013), and as a teammate (Hancock et al., 2011). Cognitive team needs also cut across technology viewpoints. Studies viewing technology as context point out the need for leaders to address the lack of shared meaning across distributed team members (Bjørn & Ngwenyama, 2009), studies viewing technology as sociomaterial call out team roles like the "shaper" who organizes diverse contributions into a coherent product (Majchrzak et al., 2007; Wagner & Majchrzak, 2006; Yates et al., 2010), and studies in the technology as teammate genre emphasize that leaders need to enable human and synthetic team members to understand and predict others' thoughts (i.e., Chakraborti et al., 2017; Talamadupula et al., 2014).

While the functional needs were present across studies conducted with different technologies in mind, another observation looking across these studies is the importance of contextualizing leadership functions to the technology. For example, team behavioral processes are needed by all teams, and yet the four technology views highlight interesting differences in the kinds of behaviors required to align team member contributions. For example, many studies of virtual teams focus generally on the need for communication (Gilson et al., 2015; Gluckler & Schrott, 2007) whereas studies of teams on large online platforms take a far more nuanced view of the behaviors that align members' contributions like engendering roles or evolving technology practices (Faraj et al., 2011). Even more detailed and contextualized in the technology are behaviors described in studies of human-agent teams. Consider this description of backchanneling behavior: "a set of mostly nonverbal behaviors by a listener in a conversation, which signals to the speaker that the listener is actively engaged in the interaction. It includes behaviors such as 'mm-hmm' vocalizations, slight nodding, eye contact, and orientation toward the speaker" (Jung et al., 2013, p. 1556). These kinds of technology-contextualized processes will continue to be essential in developing leadership theory and practice in the digital age.

Our review also highlights that leadership forms continue to be an important aspect of leadership, and one that is likely to be shaped by digital technologies. Whereas leadership functions are a more tangible and observable aspect of teams, leadership forms are less visible to team members. Conceptual and meta-analytic works point to the importance of leadership structures in enabling team performance (c.f., Pearce & Conger, 2003; D'Innocenzo et al., 2016). A theme evident in the technology as creation medium and technology as sociomaterial perspective is that technology can be pivotal in shaping team leadership structures (see *Leadership Implications 4* and *8*).

We can see from the preceding discussion that leadership functions and forms continue to be meaningful aspects of leading teams across technology perspectives. However, by examining the ways these two dimensions of team leadership are theorized across perspectives, we can better understand how these functions are met differently in different technology environments. Having taken stock of three ways that technology opens up new possibilities for leadership theory and research, and the continued utility of the dimensions of functions and forms of leadership, we conclude by considering some of the implications of technological advances for leadership development.

Leadership development in the digital age

The four perspectives of technology in teams highlighted in this review point to new directions in leadership development. As organizations continue to structure work around teams, relying more on informal relationships and less on formal hierarchy, leadership development has evolved to emphasize the importance of relationship building. Accordingly, the targets of leadership development efforts focus on the need to build social capital, rely on relational competence, and leverage social awareness and social skills (Day, 2000). Leading teams in the digital age suggests two directions for leadership development: (1) extending the relational focus to include technologies and (2) exploring ways that emerging AI tools can augment leader relational competencies.

In the technology as context view, leadership development frameworks (Day & Dragoni, 2015; Zaccaro, Ardison, & Orvis, 2003) emphasize the role of context in more technologically-enabled teams and the need for leaders to build important intra- and inter-team relationships given this context (Cullen-Lester, Maupin, & Carter, 2017). Work in this domain guides research and theory in leadership development (Day, Fleenor, Atwater, Sturm, & McKee, 2014). The other three views of technology and teams invite us to consider additional directions for leadership development.

In the technology as sociomaterial view, we might consider functional and structural leadership affordances. For example, affordances like association explain how material aspects of technology and human intentions jointly enable knowledge sharing in organizations (Treem & Leonardi, 2013). The *association affordance* describes the ways technologies can signal "established connections between individuals, between individuals and content, or between an actor and a presentation" (Treem & Leonardi, 2013, p. 162). Similarly, leadership affordances can explain the ways in which materiality and motives constitutively shape leadership emergence and effectiveness in teams. As an illustration, we may consider a *shared leadership affordance* as the use of technological features to signal the distribution of leadership across team members, needed team roles, and over time. For example, when teams have access to a communication mapping tool (Pentland, 2012), this may enable team leadership focused on equal participation in the team. Leadership development efforts are increasingly expanding the toolkit to leverage network-enhancing practices that focus on one of three aims: help individuals build social competence, help individuals shape networks, or help collectives co-create networks (Cullen-Lester et al., 2017; Leonardi & Contractor, 2018). The technology affordance perspective may offer a way forward to enable a greater emphasis on network-based interventions that target the structure of groups. Previous research calls for leadership development efforts that target teams (Day, Gronn, & Salas, 2004) and use insights from shared leadership research (e.g., Friedrich, Vessey, Schuelke, Ruark, & Mumford, 2009; Pearce & Conger, 2003) with prescriptive advice for designing team interactions. The notion of leadership affordances is ripe for future theory and research and presents a novel approach to leadership development.

In the technology as team creation medium perspective, we might consider the role of relationship-building activities carried out prior to and during team formation as an additional area for leadership development. Research in this area suggests activities related to forming teams (Harris, Gomez-Zara, DeChurch, & Contractor, 2019) and monitoring team production using technologies (Faraj & Sambamurthy, 2006) are additional aspects of leadership.

In the technology as teammate view, leadership development needs to expand focus to understand the leadership imperatives of building effective relationships among human and synthetic teammates, among human teammates as they interact with synthetic teammates, and among multiple synthetic teammates.

The second implication for leadership development concerns exploring how AI tools, such as cognitive assistants, can augment leader relational competencies. A cognitive assistant "helps its user with

various tasks" (Ebling, 2016, p. 4). Prevalent examples of cognitive assistants include Amazon's Alexa and Google Home (Kepuska & Bohouta, 2018) or IBM's Watson for Oncology which will "review all of the data and recommend treatment options based on the latest evidence and guidelines" (AOCNP, 2015, p. 31). Cognitive assistants have the potential to augment current leadership development practices, such as 360-degree feedback, coaching, mentoring, or action learning (Day, 2000). Cognitive assistants can work one-on-one with organizational members to target individualized learning, development, and self-regulation. Alternatively, cognitive assistants can work as teammates to help the team learn and develop together. The cognitive assistant may "see things" that team leaders might miss, like the structure of leadership, manifesting in subtle speech patterns otherwise undetectable to humans. Intelligent cognitive assistants represent a fascinating future direction for leadership development.

Conclusion

Instead of handing out a book at the next leadership development seminar, might attendees receive a shiny new device called Google Teamwork instead? Could such a speaker, that observes work patterns and makes personalized recommendations, ultimately replace executive coaches? Perhaps insights gleaned from listening in the workday background will be used to auto-generate a highly customized podcast delivered during an executive's daily gym workout. Rapid advances in technology and organizing invite a new genre of leadership scholarship. Age old questions of who emerges as influential, how leadership transitions and/or comes to be shared, and the leadership processes best promoting effectiveness take on new meaning when we envision crowds and intelligent robots, or "cobots" (Gillespie, Colgate, & Peshkin, 2001), working alongside humans in teams. As computer scientists push the technological frontier, leadership scholars must consider the implications of these advances for organizing. In our review, we have channeled some of the exciting developments of the digital age that relate to the field of leadership.

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Review

Natural experiments in leadership research: An introduction, review, and guidelines

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ABSTRACT

Endogeneity is a serious challenge for leadership research. To overcome the problem, researchers increasingly rely upon experimental designs, such as laboratory and field experiments. In this paper, we argue that natural experiments — in the form of standard natural experiments, instrumental variable, and regression discontinuity designs — offer additional opportunities to infer causal relationships. We conduct a systematic, cross-disciplinary review of 87 studies that leverage natural experimental designs to inquire into a leadership topic. We introduce the standard natural experiment, instrumental variable, and regression discontinuity design and use topic modeling to analyze which leadership topics have been investigated using natural experimental designs. Based on the review, we provide guidelines that we hope will assist scholars in discovering natural exogenous variations, selecting the most suitable form of natural experiment and by mobilizing appropriate statistical techniques and robustness checks. The paper is addressed to leadership and management scholars who aim to use natural experiments to infer causal relationships.

Introduction

The community of leadership scholars has started to take important steps to advance causal empirical research (Antonakis, 2017; Antonakis, Bendahan, Jacquot, & Lalivé, 2010; Banks, Goode, Ross, Williams, & Harrington, 2018). Along this line, Podsakoff and Podsakoff (2019) refer to a methodological turn towards ‘experiments,’ documented by the recent surge in the number of publications that adopt an experimental research design (e.g., Delfgaauw, Dur, & Souverijn, forthcoming; Slater, Turner, Evans, & Jones, 2018; Yeow & Martin, 2013). Expanding on this turn, Podsakoff and Podsakoff (2019) also provide a comprehensive introduction and guidelines regarding three types of experimental design: laboratory experiments; field experiments; and quasi-experiments.

Our review article aims to enrich the ‘experimental toolbox’ available to leadership scholars by emphasizing a fourth type of experiment, namely, *natural experiments*. The key feature of natural experiments is the presence of ‘naturally’ occurring events – such as new regulations

and laws, natural disasters, or economic and political crises – which heterogeneously affect the units of a population (Dunning, 2012; Harrison & List, 2004; Robinson, McNulty, & Krasno, 2009).¹ Given that these events generate random or as-if random variations in the environment, natural experiments mimic the experimental ideal in which units (e.g., individuals, teams, organizations) are split into a treatment and a control group, or, alternatively, receive different levels of treatment. This setting enables causal inference even when the substantive relationship at hand is difficult to investigate in a laboratory setting and/or would require operating costly, impractical, or unethical field experiments. Typical examples are the impact of political leaders on the economic growth of a country (Jones & Olken, 2005) or the queen bee phenomenon (Arvate, Galilea, & Todescat, 2018).

Although natural experiments are popular in economics (e.g., Angrist & Pischke, 2009) and the political sciences (e.g., Dunning, 2012), they have received less attention from management scholars (notable exceptions are Arvate et al., 2018; de Vries, 2012; Flammer & Bansal, 2017; Haack & Sieweke, 2018; Stoker, Garretsen, & Soudis,

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¹ Natural experiments differ from other forms of experiments that involve observational data, such as quasi-experiments and field experiments. Specifically, in the context of quasi-experiments, units self-select into the treatment or control condition (Shadish, Cook, & Campbell, 2002). On the contrary, in natural experiments, the assignment procedure is random or as-if random (Dunning, 2012). In other words, units in a natural experiment should not have: (i) information about the treatment; (ii) incentives and capacity to self-select into one of the experimental conditions. Also, natural experiments differ from field experiments, wherein scholars have control over the experimental manipulation (for a review of field experiments in the social sciences see Baldassarri & Abascal, 2017).

2019). The present study aims to create momentum around causal empirical research on leadership through a systematic, cross-disciplinary review of 87 studies regarding the field of leadership (Dinh et al., 2014; Gardner, Lowe, Moss, Mahoney, & Cogliser, 2010) and which use natural experiment designs. In so doing, we pursue three analytically distinct, yet interrelated goals. Firstly, we aim to understand how prior natural experiments map onto the space of leadership topics in terms of the total of 1156 research articles published in *The Leadership Quarterly* between January 2000 and March 2019. Secondly, we introduce the different types of natural experimental designs – i.e., the standard natural experiment, the instrumental variable design, and the regression discontinuity design² – using concrete examples. Thirdly, we provide guidelines to assist leadership scholars in ‘discovering’ relevant sources of natural experiments, identifying the most appropriate form of natural experiment to operate, and, finally, in analyzing the data that come from the diverse forms.

Methods

Retrieving natural experiment studies in the field of leadership

This systematic review focuses on 87 studies that leverage a natural experiment design to inquire into phenomena or theoretical relationships regarding the field of leadership (e.g., Gardner et al., 2010; Dinh et al., 2014). We identified candidate studies via an electronic search conducted within Scopus. We searched for business and management, psychology, social sciences, or multidisciplinary journal articles with the keywords ‘natural experiment,’ ‘regression discontinuity design,’ or ‘instrumental variable’ in the title, abstract, or set of author’s generated keywords.³ For January 2000–March 2019 – the timespan of our review – the search resulted in 6917 unique items.⁴

The two authors independently went through each abstract and retained all the *empirical* studies that fulfilled two criteria: First, the work adopted at least one of the three forms of natural experiment, namely, ‘standard natural experiments,’ ‘instrumental variables,’ and ‘regression discontinuity designs’ (Dunning, 2012). Second, the work addressed at least one leadership topic/theory included in Gardner et al.’s review of the theoretical conversations that characterize *The Leadership Quarterly* journal.⁵ Having completed the independent screening phase, we validated the coding decisions. We thus considered the full papers of the 87 studies that were temporarily filtered-in. Any disagreement about the theoretical focus of each individual study was reconciled through discussion and by evaluating the focal study against the conceptual categories and examples presented in Gardner et al. (2010) review. This led to the exclusion of five studies. Finally, the results achieved via the Scopus database were complemented with a Google Scholar search combining the above-mentioned keywords with the term ‘leadership.’ This led to the inclusion of five additional studies. Hence, our review was based on a set of 87 published articles.⁶

² We borrow this categorization from Dunning’s (2012) book.

³ The query we operated was as follows: TITLE-ABS-KEY (“natural experiment*”) OR TITLE-ABS-KEY (“regression discontinuity design”) OR TITLE-ABS-KEY (“instrumental variable*”) AND (LIMIT-TO (DOCTYPE, “ar”)). The outcome of the query – in the form article-level metadata – is available in the Supplemental materials.

⁴ Data were retrieved on April 5, 2019. Scientific publications may be affiliated with multiple subject areas. For example, an article published in *The Leadership Quarterly* is associated with the ‘Business, Management and Accounting,’ ‘Psychology,’ and ‘Social Sciences’ categories. Hence, conducting a separate, subject-by-subject search results in a higher number of publications than a search that concatenates the multiple subjects together.

⁵ The Supplemental materials report the categories associated with each individual study.

⁶ The number of paper-research design instances we considered is higher than the number of studies, because two studies (Dal Bó, E., Dal Bó, P., & Snyder,

Fig. 1 illustrates the distribution of the studies with respect to the form of natural experiment (Panel A) and the time period (Panel B) involved. Standard natural experiments ($N = 40$) and instrumental variable designs ($N = 41$) are the most popular forms of natural experiments in leadership research, and, overall, their diffusion seems to grow over time. Regression discontinuity designs are the least popular form ($N = 8$) and their use in the field of leadership is scattered over the last ten years. **Appendix A** provides further descriptive elements regarding the set of studies.

Characterizing the natural experiment studies

As stated in the **Introduction**, one of this paper’s goals is to understand ‘how’ natural experiment methods intersect with substantive topics in the field of leadership. In order to do this, we used topic modeling – a text mining tool rooted in computational linguistics and natural language processing⁷ – to assess how the studies retained map onto the topics dealt with in *The Leadership Quarterly*. In our case, a topic modeling approach has some advantages over manually coding papers. First, it lets the ‘data speak’ as the study-to-topic pairing is revealed inductively by analyzing the corpus of texts. Hence, the researcher does not need to subjectively assign a study to an established, theoretically derived topic. Second, topic modeling offers a nuanced characterization of the substantive focus of a study. Not only is the assignment of a document to a topic probabilistic, a document is also related to multiple topics. In other words, an article that investigates the firm level implications of gender diversity in top management teams may reflect both the ‘strategic leadership’ and ‘gender diversity in groups’ categories that Gardner and colleagues map.

In terms of design, our topic modeling involves two phases. In the first phase, we trained a Latent Dirichlet Allocation (LDA) model (Blei, Ng, & Jordan, 2003) on the abstracts of the 1156 research articles⁸ published in the *The Leadership Quarterly* between January 2000 and March 2019. **Table 1** illustrates key estimates obtained using Mallet (McCallum, 2002) and the Gensim (Řehůřek & Sojka, 2011) and spaCy (Honnibal & Montani, 2017) libraries for Python. Each cell in the table indicates the probability of a term w (e.g., ‘CEO’) of occurring in a topic τ (e.g., Topic 2). The analysis of the term-topic pairs included in the model reveals a series of substantive categories that seem consistent with Gardner et al.’s review. The models emphasize topics such as ‘female leadership’ (Topic 1); ‘emotions and leadership’ (Topic 2); ‘transformational leadership’ (Topic 3) ‘development of leadership’ (Topic 4); ‘dyadic relations’ (Topic 5); ‘cognition and leadership’ (Topic 6); ‘strategic leadership’ (Topic 7); ‘ethical leadership’ (Topic 8); ‘charismatic leadership’ (Topic 9); and ‘leadership in team and decision groups’ (Topic 10).

In the second phase, we used a folding-in strategy by ‘projecting’ each of the 87 natural experiments onto the trained LDA model. We thus represented each retained study in terms of the very same ten topics that represent the corpus of 1156 abstracts published in *The Leadership Quarterly* between January 2000 and March 2019. This enabled us to characterize a natural experiment in terms of one or a few salient topics (i.e., those that occur with a higher likelihood in the document) or to allocate it as being leadership research. **Appendix B** provides further descriptive elements about the estimation procedure behind our LDA model. The Supplemental materials contain the data and the Python code to reproduce the set of exhibits reported in the paper.

(footnote continued)

2009; Dasgupta, 2018) use two research designs.

⁷ For a non-technical introduction to the topic, see Mohr and Bogdanov (2013).

⁸ Editorial notes were not used to train the model.

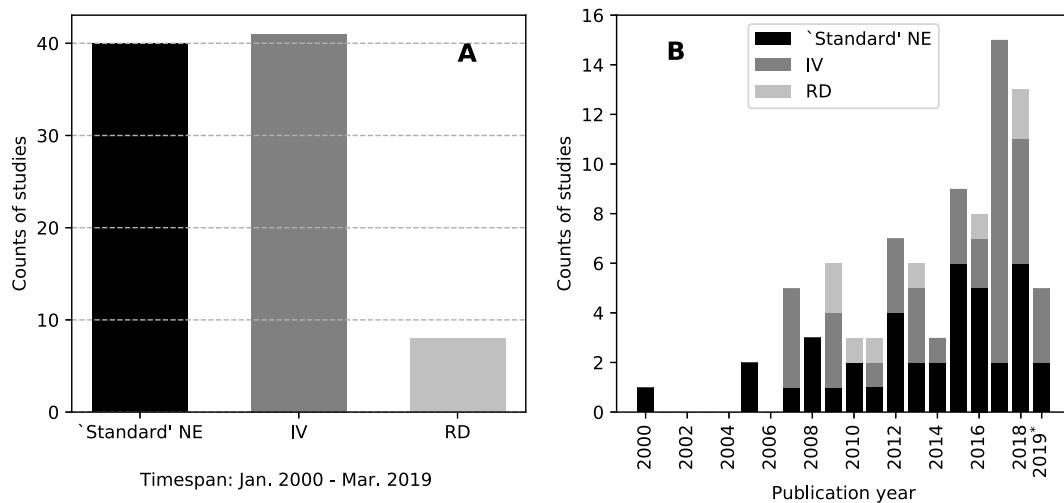


Fig. 1. Counts of retrieved studies across forms of natural experiment and time. Notes.—‘Standard NE’ denotes the group of studies that use an average treatment on the treated approach; ‘IV’ denotes the group of studies using the instrumental variable design; ‘RD’ denotes the group of studies using a regression discontinuity design. Panel ‘A’ illustrates the group of studies across forms of NE experiments for the whole timespan; Panel ‘B’ accounts for the formation of the stock data reported in Panel ‘A’. * ‘2019’ data concern the first quarter of the year only. The number of individual studies is 87; [Dal Bó et al. \(2009\)](#) is included in both the IV and RD categories; [Dasgupta \(2018\)](#) is included both in the SNE and IV categories.

Table 1
Term-topic matrix.

Topic number	Terms as lemmas										
1	context (0.042)	woman (0.03)	difference (0.024)	power (0.024)	role (0.02)	gender (0.017)	practice (0.017)	female (0.016)	culture (0.013)	position (0.012)	
2	perception (0.034)	affect (0.033)	role (0.03)	emotion (0.028)	positive (0.028)	emotional (0.026)	negative (0.026)	network (0.017)	influence (0.016)	collective (0.016)	
3	transformational (0.056)	subordinate (0.043)	rating (0.026)	trait (0.021)	associate (0.017)	experience (0.016)	significant (0.016)	personality (0.016)	high (0.014)	analysis (0.014)	
4	development (0.046)	perspective (0.027)	develop (0.017)	political (0.015)	include (0.015)	purpose (0.013)	interest (0.013)	view (0.012)	multiple (0.012)	year (0.01)	
5	employee (0.054)	work (0.048)	lmx (0.034)	job (0.023)	supervisor (0.023)	perceive (0.021)	authentic (0.019)	mediate (0.018)	hypothesis (0.016)	satisfaction (0.015)	
6	understand (0.024)	effective (0.02)	vision (0.019)	problem (0.017)	cognitive (0.017)	strategy (0.015)	lead (0.014)	dynamic (0.013)	proposition (0.013)	identify (0.013)	
7	performance (0.106)	team (0.085)	member (0.033)	ceo (0.03)	management (0.021)	skill (0.019)	firm (0.018)	decision (0.017)	share (0.015)	strategic (0.015)	
8	level (0.029)	increase (0.024)	ethical (0.023)	develop (0.019)	impact (0.017)	moral (0.016)	structure (0.015)	reveal (0.014)	practice (0.013)	integrity (0.012)	
9	charismatic (0.051)	change (0.041)	manager (0.035)	time (0.03)	charisma (0.025)	style (0.018)	content (0.014)	crisis (0.013)	type (0.012)	managerial (0.01)	
10	group (0.073)	effectiveness (0.04)	task (0.03)	condition (0.023)	identity (0.022)	individual (0.021)	emergence (0.019)	show (0.017)	response (0.015)	characteristic (0.014)	

Notes. Estimations achieved with Mallet software and the Gensim library for Python; number of documents = 1156; number of topics = 10; terms are arranged in descending order of likelihood to appear in topic i ; the optimal number of topics to retain is based on the comparison and contrast of the coherence value of 29 competing models in the 1–29 topics range — see [Appendix B](#) for further details about the estimation procedure.

Literature review

Standard natural experiments

The standard natural experimental design was already used in the first-ever natural experiment, in which [Snow \(1855\)](#) analyzed the transmission of cholera in London. In its ‘simplest’ form, the standard natural experiment resembles the design of a randomized experiment in that there are two groups – the treatment and control group – with two observations per group — a pre- and a post-treatment observation.⁹ As shown in [Fig. 2](#), we can estimate the causal effect of the treatment by

comparing the average change of the outcome variable y for the treated units ($\lambda + \delta$) and controls (γ). Of course, the ‘simple’ form of the standard natural experiment can be extended in several ways, such as by adding additional treatment groups or by adding additional time periods before and/or after the treatment (e.g., [Matsa & Miller, 2013](#)).

Whether the standard natural experiment provides a causal estimate mainly depends on the qualities of the treatment. In the case of random variations, such as lotteries, the assignment process needs to be truly random (e.g., [Starr, 1997](#)). In the case of as-if random variations, the assignment process needs to be independent of factors that are related to the outcome and not affected by the unit’s self-selection into treatment or control conditions ([Dunning, 2012](#)). The second part of the document deals with these aspects in more detail.

Standard natural experiment and leadership research

[Table 2](#) reports the set of studies that draw upon the standard

⁹ The standard natural experiment is also often referred to as “difference in difference (DID)” design; yet, not all DID designs represent natural experiments, e.g., if the assignment is based on self-selection or unobserved covariates and not on an as-if randomization ([Wing, Simon, & Bello-Gomez, 2018](#)).

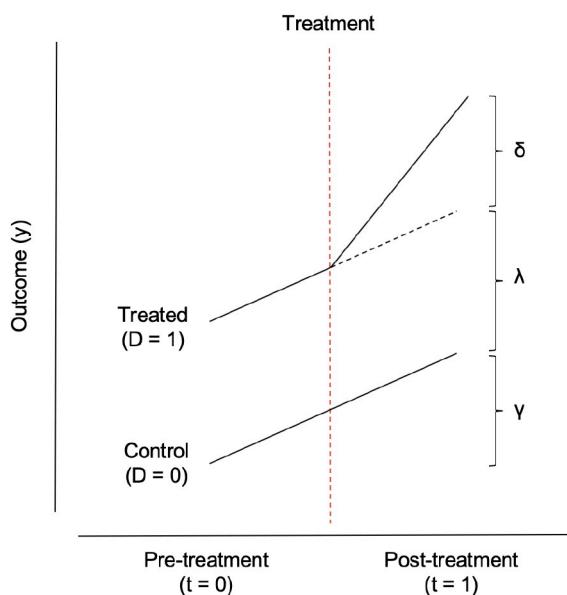


Fig. 2. Visual representation of the standard natural experiment. *Notes.* The underlying population regression function is $y = \gamma t + \lambda D + \delta t D$, where γ , λ , and δ represent the systematic difference in the outcome across the treated and control cases, the trend effect and the difference in the outcome that is due to the treatment. For sake of clarity, we represent the case in which $\delta > 0$.

natural experiment design to address a leadership-related topic. The left-hand column indicates the short reference for the study; the remaining columns provide a substantive characterization of the study. The right-hand columns present the inductive categorization of studies as emerging from the topic modeling described in the previous section. In the interest of clarity, we have just reported the two most salient topics of each study — i.e., the topics with the highest chance of being paired with the focal document.

Our topic model highlights the focus of the standard natural experiments and consists of three core topics – ‘female leadership’ (Topic 1); ‘strategic leadership’ (Topic 7); and ‘ethical leadership’ (Topic 8) – together with a series of other themes that, although less central, still receive significant attention (see Topics 2, 3, 4, 6, 9, and 10). The prominence of Topics 1, 7 and 8 is clear from Fig. 3, Panel A, which shows the frequency with which salient topics appear in the documents.

The scatter plot in Panel B of Fig. 3 expands on the outcome of the topic model by positioning each natural experiment in the topic space that characterizes the population of articles published in *The Leadership Quarterly*. The coordinates of each data point are produced via multi-dimensional scaling. This allows us to create a shallow representation of the 10-dimension space underlying the topic model. ‘Stars’ are associated with natural experiments. *The Leadership Quarterly* articles are represented with circles that have been color-coded to reflect the dominant topic of the document. The diagram highlights that: (i) standard natural experiments map onto a narrow portion of the space, whereas vast areas of leadership research have been barely or not impacted at all by this form of causal research; (ii) an initial cluster of studies emerges at the intersection of ‘female leadership’ and strategic leadership (see the bottom right of the chart); (iii) a second cluster of studies jointly investigate ‘ethical leadership’ and ‘nature of managerial work’ subjects (see the middle left of the chart).

Standard natural experiment examples

Our review shows there is a significant number of studies using standard natural experiments to address selected leadership-related topics. We concentrate on three examples in order to provide leadership scholars with insights into the application of the standard natural experiment for inferring causal relationships.

The first study, by Beaman et al. (2012), uses a standard natural experiment to analyze whether female leadership has an impact on girls’ career aspirations and educational attainment. The authors hypothesize that a female leader will act as a role model for girls and young women, and will thereby affect their career aspirations and educational attainment. The authors argue that analyzing this relationship in laboratory experiments is difficult, because participants are exposed to the role model for a short period of time, whereas in observational studies, people may self-select to certain role models based on observed and unobserved characteristics. Beaman et al. (2012) thus exploit the enactment of a law in India in 1993 that determined that in some randomly selected villages, the position of chief councilor was reserved for women. The law resulted into two treatment groups and a control group. The first treatment group consists of villages in which this position was reserved for women in one election (either 1998 or 2003); in the second treatment group, the position was reserved for women in two elections (in 1998 and 2003); and in the control group, the position was never reserved for women. The authors collected survey data from 15 randomly selected households in each village in 2006 and 2007. Their difference-in-means analyses show that the gender gap in parents’ career aspirations for their children was much lower in villages in which the council positions had been reserved for women twice compared to villages in which the position had been reserved for women once or never. The analyses also indicate that the gap in educational aspirations between boys and girls was much lower in villages with female leaders than in villages with male leaders. Based on some additional analyses, the authors conclude that the effects are mainly caused by a role model effect; that is, female leaders provide a role model both for parents and for girls. Overall, the standard natural experiment by Beaman et al. (2012) provides important insights into the causal effect of female leadership on (female) followers’ aspirations.

In the second study, Matsa and Miller (2013) exploit the introduction of ‘gender quota’ policies in Norway to investigate how female leadership influences strategic choices and outcomes, for example corporate downscaling. The gender quotas forced all publicly listed firms in Norway to increase the proportion of women on the board of directors to 40% within two years. Because the gender quota policy applied to all listed firms, it was not a random variation in the regulatory environment. However, the authors argue that the policy targets companies that are part of a broader population of Scandinavian firms, that is, organizations facing relatively similar cultural and institutional factors. The Norwegian policy may therefore have an as-if-random interpretation. Matsa and Miller (2013) used a matching approach in which they first pair treated (i.e., publicly listed) and untreated (i.e., unlisted) Norwegian firms, and, in the second step, linked Norwegian firms to listed and unlisted firms located in Denmark, Finland, and Sweden. The summary statistics showed that the treatment and control group were similar in terms of most firm characteristics. To analyze the causal effect of female leadership on strategic choices and outcomes, the authors used the difference-in-differences and difference-in-difference-in-differences¹⁰ analytical frameworks. They found that the gender quota had a negative impact on firm profitability. In further analyses, the authors showed that profit differentials were mainly attributable to the fact that companies treated with the quota policy tended to cut less jobs than their counterparts. To back up the causal interpretation of their results, Matsa and Miller (2013) conducted several robustness checks, such as testing for trends before the introduction of the quota and testing whether the effects were stronger for firms with fewer women on their board of directors. Overall, the study provides causal empirical evidence supporting the effect of female leadership on firm performance as mediated by key strategic choices.

¹⁰ The difference-in-difference-in-differences framework is also referred to as the ‘triple diff-in-diffs.’

Table 2
Standard natural experiments — substantive focus.

Study	Salient topics			
	1 st topic		2 nd topic	
	Topic label	Prob.	Topic label	Prob.
Bae and Yi (2008)	Charismatic leadership	0.134	Ethical leadership	0.133
Beaman, Duflo, Pande, and Topalova (2012)	Transformational leadership	0.2	Female leadership	0.165
Belloc, Drago, and Galbiati (2016)	Cognition and leadership	0.143	Development of leadership	0.134
Bhavnani (2017)	Charismatic leadership	0.165	Female leadership	0.148
Breda and Ly (2015)	Female leadership	0.204	Emotions and leadership	0.148
Brockman, Ma, and Ye (2015)	Strategic leadership	0.332	Ethical leadership	0.102
Byrd, Fraser, Scott Lee, and Tartaroglu (2012)	Strategic leadership	0.174	Female leadership	0.165
Bægaard (2011)	Leadership in teams	0.18	Female leadership	0.167
Chauhard (2014)	Female leadership	0.137	Leadership in teams	0.127
Chen, Cumming, Hou, and Lee (2016)	Strategic leadership	0.181	Female leadership	0.171
Cheng, Nagar, and Rajan (2005)	Strategic leadership	0.173	Development of leadership	0.113
Cohen and Wang (2013)	Leadership in teams	0.139	Development of leadership	0.128
Coman (2018)	Development of leadership	0.149	Female leadership	0.131
Cox, Rosenbluth, and Thies (2000)	Strategic leadership	0.155	Leadership in teams	0.14
Cufiat and Guadalupe (2009)	Strategic leadership	0.194	Ethical leadership	0.159
Dahya and McConnell (2005)	Female leadership	0.227	Emotions and leadership	0.108
Dasgupta (2018)	Female leadership	0.123	Charismatic leadership	0.119
de Paola and Scoppa (2015)	Female leadership	0.233	Leadership in teams	0.125
de Paola, Scoppa, and Lombardo (2010)	Female leadership	0.322	Cognition and leadership	0.104
Gittell, Weinberg, Bennett, and Miller (2008)	Dyadic relations	0.18	Emotions and leadership	0.13
Gormley, Matsa, and Milbourn (2012)	Strategic leadership	0.202	Charismatic leadership	0.135
Guadalupe and Wulf (2010)	Strategic leadership	0.179	Ethical leadership	0.127
Han and Zhang (2018)	Female leadership	0.194	Strategic leadership	0.155
Hidalgo, Canello, and Lima-de Oliveira (2016)	Female leadership	0.186	Emotions and leadership	0.126
Huber and Arceneaux (2007)	Charismatic leadership	0.214	Ethical leadership	0.136
Jayaraman and Milbourn (2015)	Strategic leadership	0.274	Emotions and leadership	0.109
Jiraporn and Lee (2018)	Female leadership	0.205	Development of leadership	0.113
Jiraporn, Lee, Park, and Song (2018)	Female leadership	0.19	Ethical leadership	0.128
Kahn, Li, and Zhao (2015)	Cognition and leadership	0.157	Female leadership	0.141
Laustsen and Petersen (2017)	Development of leadership	0.15	Cognition and leadership	0.128
Matsa and Miller (2013)	Female leadership	0.224	Strategic leadership	0.177
Poulos (2019)	Female leadership	0.169	Ethical leadership	0.126
Rickman and Witt (2008)	Transformational leadership	0.128	Strategic leadership	0.122
Shea and Solis (2018)	Ethical leadership	0.127	Female leadership	0.12
Siming (2016)	Female leadership	0.161	Cognition and leadership	0.158
Tabvuma, Bui, and Homberg (2014)	Charismatic leadership	0.138	Female leadership	0.128
Tosun (2016)	Strategic leadership	0.238	Ethical leadership	0.118
Valdini (2012)	Female leadership	0.271	Transformational leadership	0.115
Vo and Canil (2019)	Strategic leadership	0.217	Ethical leadership	0.134
Wyrwich (2015)	Transformational leadership	0.165	Cognition and leadership	0.154

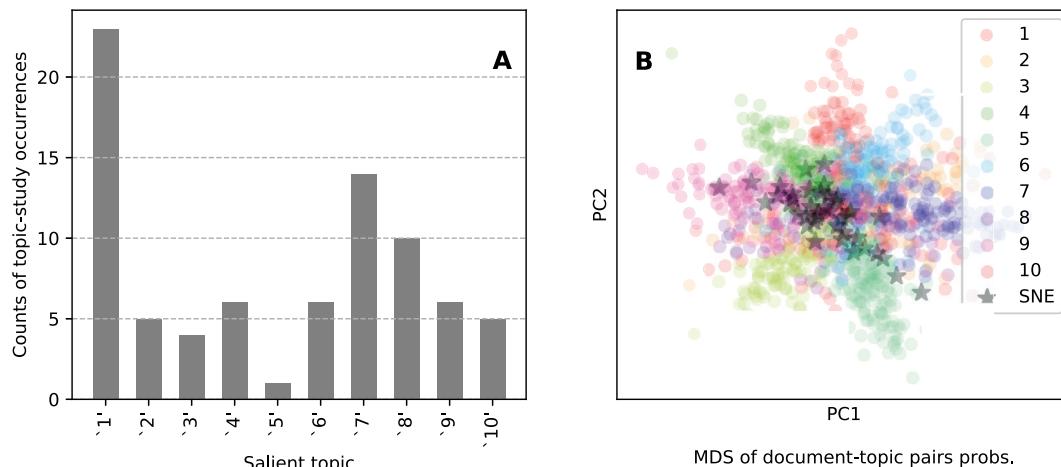


Fig. 3. Standard natural experiments — topic characterization. Notes. Panel A pictorially depicts the information reported in Table 2; Panel B: Data points marked with a star denote natural experiments that are folded in the topic model trained on the 1156 articles published in The Leadership Quarterly; Topic labels: Topic 1 — ‘female leadership’; Topic 2 — ‘emotions and leadership’; Topic 3 — ‘transformational leadership’; Topic 4 — ‘development of leadership’; Topic 5 — ‘(neo-) charismatic leadership’; Topic 6 — ‘cognition and leadership’; Topic 7 — ‘strategic leadership’; Topic 8 — ‘ethical leadership’; Topic 9 — ‘nature of managerial work’; Topic 10 — ‘leadership in teams and decision group.’ ‘MDS’ stands for multidimensional scaling; ‘PC1’ and ‘PC2’ refer to the components returned from the MDS analysis.

The third study, by [Shea and Solis \(2018\)](#), analyzes the relationship between leader tenure and countries' creditworthiness. The authors argue that higher leader tenure will reduce uncertainty in the sovereign credit market and will therefore increase a country's creditworthiness. Since leader tenure is endogenous (e.g., effective leaders tend to have a higher tenure), the authors backup their panel data analysis with a natural experiment in which leader tenure is exogenously determined. They focused on countries characterized by attempts to assassinate the political leader. While such events are not random, as confirmed by the authors' balance tests (see also the discussion in [Jones & Olken, 2005](#)), the outcome is as-if random. The authors provide anecdotal evidence for this claim (e.g., the successful assassination of President Kennedy versus the unsuccessful assassination of President Reagan) and excluded all assassinations in which the success was not determined by chance (e.g., *en coup d'état*). [Shea and Solis \(2018\)](#) used a two-step approach in their analysis. First, they regressed sovereign bond yields on leader tenure, assassination success, and an interaction term. The interaction term was positive and significant, which indicated that assassination success had a stronger effect on bond yields at higher levels of leader tenure. Second, the authors accounted for a potential selection in the assassination sample (i.e., assassination attempts are likelier in poorer, non-democratic states) by applying the Heckman selection model, which supported the findings from the OLS. Overall, the study used an unusual exogenous variation of leader tenure to provide robust evidence that leader tenure influences a country's creditworthiness.

To sum up, the three examples of standard natural experiments explore important leadership topics (e.g., consequences of a leader's tenure and female leadership) and provide robust causal inference. The three studies use very different exogenous variations, such as laws or even assassination attempts, and focus on leadership in the contexts of villages, firms, and states. Thus, the three examples highlight both the potential and the variability of standard natural experiments for leadership research.

Instrumental variable designs

Instrumental variable (IV) designs have already received some attention in management research, as several researchers recommend their use to correct for endogeneity in the relationship between an independent variable and a dependent variable (e.g., [Bascle, 2008](#); [Semadeni, Withers, & Certo, 2014](#)). The basic idea of the IV design is shown in [Fig. 4](#): The treatment variable D is influenced by covariates A , B , and F . Because at least one of the covariates is unobserved, we cannot

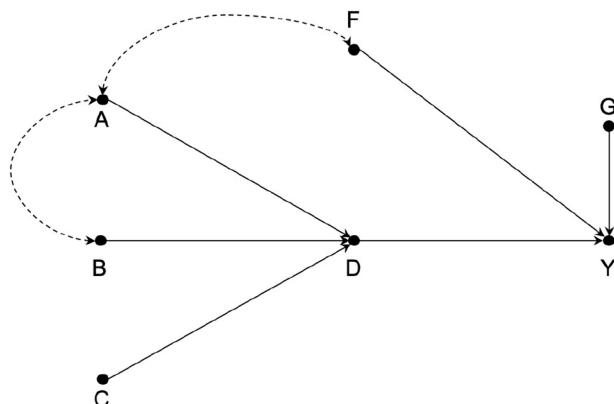


Fig. 4. Visual representation of the instrumental variable framework. *Notes.* Continuous, oriented arrows denote the causal effect linking two variables; Dashed edges denote the presence of a common cause between two variables; C is an instrumental variable for D ; A , B , and F are observables that influence D ; G is a variable that affects the outcome but it is not causally related to D , so it does not affect the presumed causal path linking D to Y .

Source: [Morgan and Winship \(2015, page 30\)](#).

directly estimate the causal effect of the treatment D on the outcome Y . The IV design 'solves' the endogeneity problem, which results from the omitted variable bias, by leveraging an instrument C to which subjects are (as-if) randomly assigned ([Dunning, 2012](#)).

A valid instrument needs to fulfill three conditions ([Angrist & Pischke, 2009](#)). First, it needs to be exogenous, which means that it is uncorrelated with other causes of the dependent variable except for the treatment. Second, the instrument needs to influence the assignment of the treatment (i.e., it influences the probability of receiving the treatment). Third, the instrument has no relationship with the dependent variable except through the treatment. A violation of the conditions can lead to a severe bias in the estimates ([Bound, Jaeger, & Baker, 1995](#); [Semadeni et al., 2014](#)). It is therefore important that researchers thoroughly scrutinize any candidate instrument and check whether and to what extent it fulfills these three conditions.

Instrumental variable designs and leadership research

[Table 3](#) reports the set of studies that draw upon the IV design. Our topic model – whose insights are summarized in [Fig. 5](#), Panel A – reveals that 'female leadership' (Topic 1) and 'strategic leadership' (Topic 7) tend to dominate the focus of attention of this group of studies. In fact, the core topics are even more core in this case than in standard natural experiments, whereas the number of documents that build on the remaining topics is relatively small. Panel B, showing the positioning of IV designs in terms of the articles published in *The Leadership Quarterly*, confirms that the data-points are concentrated in the bottom right of the chart.

Instrumental variable design examples

Our review shows that several studies in leadership research have applied the IV design, but only to address very few topics. In this section, we will focus on three example studies and explain their approach in more detail in order to provide leadership scholars with insights into how the IV design can be applied.

The first study was conducted by [Bennedsen et al. \(2007\)](#). It analyzed the relationship between CEO succession decisions, particularly the decision of family firms to hire a family or an external CEO, and firm performance. Testing the causal effect of CEO succession decisions on firm performance is difficult, because family members have in-depth knowledge regarding the characteristics of other family members (e.g., human capital), which will probably affect their decision to hire an external candidate. To infer a causal relationship, the authors use the gender of the departing family CEO's firstborn child as an instrument. They provide evidence that (i) the instrument is exogenous, because gender is randomly assigned; (ii) the instrument is relevant, because in the case of a family transition, it is about 10% higher when the firstborn child is male; and (iii) the instrument is unlikely to affect firm performance through other channels than CEO succession decisions, because a first child's gender is not related to firm-level attributes (e.g., age, size, and profitability). The authors conducted supplemental statistical analyses (e.g., using CEO deaths as an alternative instrument; ruling out changes in governance structure as alternative explanations) to back up their finding that appointing a family CEO leads to a decline of ca. 4% in firm profitability. Overall, the study adopts a creative instrument to estimate the causal impact of hiring professional managers on firm-level outcomes.

In the second study, [Yang et al. \(2019\)](#) investigated the relationships between students' centrality within a social network, gender, and attainment of leadership positions. The authors apply a two-study design in which they first test their hypotheses based on observational data, then infer the causal relationship by means of an IV design. The correlational study shows that a student's ego-network is related to her or his job placement in leadership positions. Network centrality is positively related to job placement both for male and female students — however, female students especially benefit from more women-dominated networks and from relatively even communication with peers.

Table 3

Instrumental variables designs — substantive focus.

Study	Salient topics			
	1 st topic		2 nd topic	
	Topic label	Prob.	Topic label	Prob.
Adams, Almeida, and Ferreira (2009)	Strategic leadership	0.214	Female leadership	0.113
Adhikari (2018)	Female leadership	0.177	Strategic leadership	0.134
Adkins, Carter, and Simpson (2007)	Strategic leadership	0.162	Female leadership	0.134
Aghion, Van Reenen, and Zingales (2013)	Strategic leadership	0.151	Female leadership	0.148
Akyol and Cohen (2013)	Female leadership	0.186	Strategic leadership	0.181
Amore, Garofalo, and Minichilli (2014)	Female leadership	0.181	Strategic leadership	0.142
Amore, Miller, Le Breton-Miller, and Corbett (2017)	Strategic leadership	0.156	Transformational leadership	0.122
Arora (2018)	Female leadership	0.176	Strategic leadership	0.144
Artz, Goodall, and Oswald (2017)	Transformational leadership	0.185	Dyadic relations	0.163
Azoulay, Liu, and Stuart (2017)	Transformational leadership	0.139	Development of leadership	0.135
Barros and Nunes (2007)	Strategic leadership	0.136	Ethical leadership	0.134
Bennedsen, Nielsen, Perez-Gonzalez, and Wolfenzon (2007)	Strategic leadership	0.283	Transformational leadership	0.181
Bernile, Bhagwat, and Yonker (2018)	Female leadership	0.179	Ethical leadership	0.171
Chen, Leung, and Goergen (2017)	Female leadership	0.226	Development of leadership	0.127
Chintrakarn, Jiraporn, Tong, and Chatjuthamard (2017)	Cognition and leadership	0.156	Strategic leadership	0.144
Conroy and Weiler (2016)	Strategic leadership	0.219	Female leadership	0.14
Conyon and He (2017)	Strategic leadership	0.198	Female leadership	0.191
Dal Bó et al. (2009)	Female leadership	0.208	Development of leadership	0.179
Dasgupta (2018)	Female leadership	0.123	Charismatic leadership	0.119
Delis, Gaganis, Hasan, and Pasiouras (2017)	Female leadership	0.239	Strategic leadership	0.139
Driver and Guedes (2017)	Strategic leadership	0.155	Development of leadership	0.144
Frantz and Stein (2017)	Female leadership	0.151	Strategic leadership	0.138
Gabel and Scheve (2007)	Female leadership	0.141	Development of leadership	0.121
Harjoto and Rossi (2019)	Female leadership	0.15	Strategic leadership	0.124
Hearn and Filatotchev (2019)	Ethical leadership	0.156	Female leadership	0.128
Hooghiemstra, Kuang, and Qin (2017)	Female leadership	0.141	Strategic leadership	0.132
Izgi and Akkas (2012)	Strategic leadership	0.203	Female leadership	0.151
Khwaja (2009)	Strategic leadership	0.17	Female leadership	0.126
Kilic and Kuzey (2016)	Female leadership	0.232	Strategic leadership	0.174
Li, Gong, Zhang, and Koh (2018)	Strategic leadership	0.19	Transformational leadership	0.156
Lin, Lin, Song, and Li (2011)	Strategic leadership	0.189	Cognition and leadership	0.183
Markussen and Røed (2017)	Female leadership	0.196	Transformational leadership	0.148
Nicolosi and Yore (2015)	Strategic leadership	0.203	Female leadership	0.129
Pascal, Mersland, and Mori (2017)	Strategic leadership	0.209	Female leadership	0.172
Rouse (2012)	Transformational leadership	0.167	Strategic leadership	0.128
Sabatier (2015)	Female leadership	0.165	Ethical leadership	0.138
Shue and Townsend (2017)	Strategic leadership	0.172	Emotions and leadership	0.167
Sun and Hovey (2013)	Strategic leadership	0.273	Female leadership	0.115
Yang, Chawla, and Uzzi (2019)	Female leadership	0.186	Emotions and leadership	0.144
Wu (2015)	Female leadership	0.175	Ethical leadership	0.124
de Vries (2012)	Transformational leadership	0.234	Leadership in teams	0.219

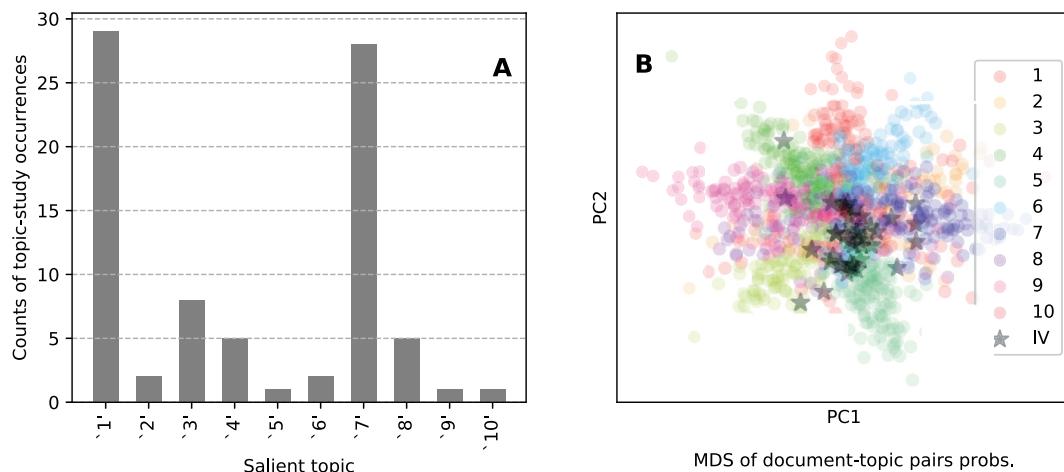


Fig. 5. Instrumental variable designs — topic characterization. Notes. Panel A pictorially depicts the information reported in Table 3; Panel B: Data points marked with a star denote natural experiments that are folded in the topic model trained on the 1156 articles published in The Leadership Quarterly; Topic labels: Topic 1 — ‘female leadership’; Topic 2 — ‘emotions and leadership’; Topic 3 — ‘transformational leadership’; Topic 4 — ‘development of leadership’; Topic 5 — ‘(neo-) charismatic leadership’; Topic 6 — ‘cognition and leadership’; Topic 7 — ‘strategic leadership’; Topic 8 — ‘ethical leadership’; Topic 9 — ‘nature of managerial work’; Topic 10 — ‘leadership in teams and decision groups.’ ‘MDS’ stands for multidimensional scaling; ‘PC1’ and ‘PC2’ refer to the components returned from the MDS analysis.

Because the observational study provides no insights into the causal focal relationship, the authors exploit an exogenous variation in the context. When students start their MBA programme, they are randomly assigned to home sections. Students take their first-quarter classes only with students from their home section, which is why their home-section-mates initially represent their most important friends. Later in their studies, students bid for second-quarter classes. Since the enrollment of students into classes is relatively unpredictable (i.e., many students even end up in classes they did not bid for), students have limited influence on the inter-personal ties they will develop. The authors used a student's degree of exposure to same-gender classmates from other home sections as the instrument. The findings of the IV design mostly support the correlational study. Female students' job placements are influenced by having an inner circle, whereas no effect was found for male students. Overall, the study exploits the as-if random assignment of students to networks as an instrument to estimate the causal effect of networks on attaining leadership positions, particularly for female leaders.

Finally, Chintrakarn et al. (2017) investigated the relationship between managers' religious piety and firms' anti-takeover provisions. For the instrument, the authors used the degree of religious piety from 1971 in the community surrounding a company's headquarters. First, the authors regressed the number of anti-takeover defenses on the non-instrumented current religious piety variable and found a positive effect. In the second step, they analyzed the same relationship based on instrumented values of current religious piety. The two-stage least squares analysis supported the conclusion of the correlational analysis that current religious piety affects corporate governance, although the coefficient of the instrumented treatment variable was smaller ($b = 0.849$) than the coefficient of the non-instrumented treatment variable ($b = 1.256$). As a robustness check, the authors used another instrumental variable — the degree of religious piety in the population in 1952. The result of the two-stage least squares supported the prior findings. Overall, the authors provide evidence that religious piety substitutes for corporate governance and reduces the conflict between managers and shareholders.

To sum up, the three examples highlight creative ways of applying instruments to estimate causal relationships involving a variety of leadership topics — including the consequences of leader selection for firms (Bennedsen et al., 2007), leadership development (Yang et al., 2019), and the consequences of culture on strategic leadership (Chintrakarn et al., 2017).

Regression discontinuity design

The regression discontinuity(RD) design was initially developed by Thistlethwaite and Campbell (1960). It capitalizes on the fact that in many settings (e.g., business and education) a unit's score – above or below a certain threshold on a continuous variable – determines the treatment status of the unit. The basic idea of the RD design is shown in Fig. 6. When the assignment variable X is greater than or equal to x^* , which represents the threshold, units receive the treatment; if X is smaller than x^* , units receive no treatment. The RD design builds on the assumption that in the neighborhood of the threshold (x^*) the assignment process is almost random (Dunning, 2012; Lee & Lemieux, 2010). Then, the variance in the outcome variable y across the $X < x^*$ and $X \geq x^*$ regimes is caused by the treatment (Antonakis et al., 2010), represented by the quantity δ .

So far, we have assumed that the probability of treatment assignment changes from 0 to 1 when $X > x^*$. This so-called 'sharp' RD design is probably the most common form in empirical research. However, some studies also apply a 'fuzzy' RD design. Here, the change in the probability of receiving the treatment is much smaller than in the sharp RD design when $X \geq x^*$ (Lee & Lemieux, 2010). For instance, the probability of receiving the treatment may just increase by several percentage points at the threshold (see, e.g., Grönqvist & Lindqvist,

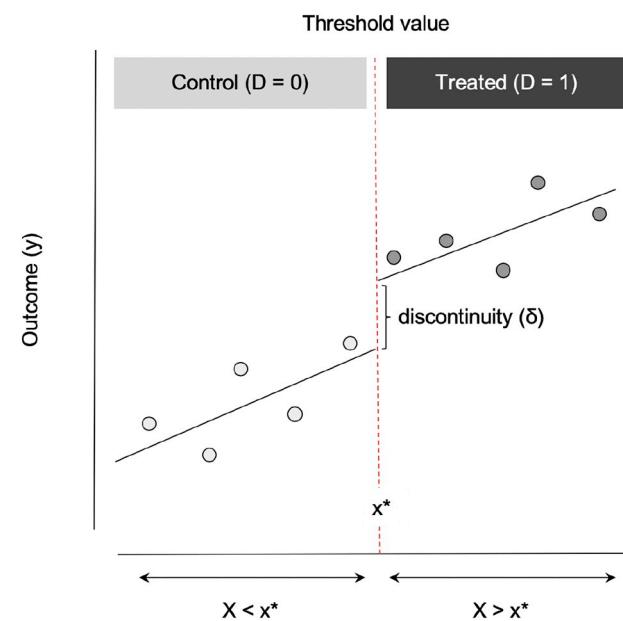


Fig. 6. Visual representation of the regression discontinuity design. Notes. The underlying population regression function is $y = \alpha + \delta D + \beta(X - x^*)$, where y is the response variable, α is the intercept, δ denotes the systematic difference in y across control and treated units, whereas β is the regression slope of the mean centered X scores.

2016). Although the sharp and the fuzzy RD differ to some extent, researchers can use both RD designs to estimate the average causal effect of the treatment.

Regression Discontinuity Designs and Leadership Research

Table 4 shows the set of leadership studies drawing upon an RD design. The distribution of leadership topics across the documents (see Fig. 7, Panel A) confirms causal methods – irrespective the specific estimation framework – are core to the study of female leadership (in fact, Topic 1 has the highest number of occurrences among 'salient topics'). In addition, the RD design seems to associate to another two topics, namely 'nature of managerial work' (Topic 9) and 'leadership in teams and decision groups' (Topic 10).

Regression discontinuity design examples

Our review indicates that to date only a few leadership studies have used the RD design. We will discuss three studies and analyze their approach in more detail in order to provide leadership scholars with insights into applying the RD design for inferring causal relationships.

The first study that we have selected is by Arvate et al. (2018). They adopted a sharp RD design to analyze the 'queen bee' phenomenon (Staines, Tavris, & Jayaratne, 1974), which states that women in leadership positions do not support – and may even penalize – female followers. The authors point out that prior studies on the phenomenon are affected by reverse causality and omitted variable biases, and, therefore, do not have a causal interpretation. To overcome these problems, the authors use an RD design focusing on close-run elections in Brazilian municipalities. Empirical data indicate that those municipalities in which women are elected as mayors over a male candidate by a close margin do not differ from municipalities in which women just lost the election against a male competitor. Thus, near the threshold (i.e., 50% of votes), it is almost random as to whether a woman or a man is assigned to the leadership position. The results do not provide clear evidence for the queen bee hypothesis. In public organizations, which are under the influence of mayors, the ratio of female to male workers is reduced for middle management (anti-women) but increased for top management (pro-women) in municipalities ruled by female

Table 4
Regression discontinuity designs — substantive focus.

Study	Salient topics			
	1 st topic		2 nd topic	
	Topic label	Prob.	Topic label	Prob.
Arvate et al. (2018)	Female leadership	0.373	Charismatic leadership	0.129
Boas and Hidalgo (2011)	Leadership in teams	0.177	Charismatic leadership	0.16
Butler (2009)	Charismatic leadership	0.203	Female leadership	0.127
Dal Bó et al. (2009)	Female leadership	0.208	Development of leadership	0.179
Dunning and Nilekani (2013)	Leadership in teams	0.15	Female leadership	0.148
Grönqvist and Lindqvist (2016)	Transformational leadership	0.14	Leadership in teams	0.123
Heck and Moriyama (2010)	Cognition and leadership	0.129	Ethical leadership	0.123
Lechler and McNamee (2018)	Leadership in teams	0.16	Female leadership	0.132

mayors. Overall, the study applies a sharp RD design to test the causal effect of female leaders on the career opportunities of female followers.

The second study is by Heck and Moriyama (2010), who used a sharp RD design to analyze the indirect relationship between improvement-focused school leadership and student learning outcomes via school instructional practices. The authors exploit the discontinuity which results from a cut-off date for students for starting kindergarten. In the study setting, students who were 5 years old by December 31 were assigned to the treatment (i.e., one year further schooling), whereas students who were 4 years old by December 31 were assigned to the control group (i.e., one year less schooling). Again, we can argue that near the cut-off, the student assignment to the treatment and control groups is as good as random, because parents cannot precisely manipulate the birth date of their children. Due to students' nesting within schools, the authors applied a multilevel RD design. The results provide causal evidence for the benefits of one additional year of schooling (i.e., the added-year of schooling effect). The authors further show that the added-year of schooling effect is influenced by the effect of improvement-focused school leadership on school instructional practices.

Finally, Grönqvist and Lindqvist (2016) used a fuzzy RD design to analyze how receiving military officer training influences the probability of attaining a civil leadership position. Directly testing this relationship is difficult as individuals who receive officer training differ from individuals who do not receive the training with regard to observable and unobservable characteristics (e.g., abilities). To infer the

causal effect of the officer training, Grönqvist and Lindqvist (2016) used discontinuities in test scores as the identification strategy. That is, all individuals who were drafted in the Swedish military had to complete a cognitive ability test in which their abilities were ranked according to four dimensions on a scale from 1 (lowest) to 9 (highest). Although the test score did not determine whether or not a person received the training, it significantly increased the probability of being treated. For instance, receiving the officer training 'jumps' from only 2% of the recruits with a score of 17 to 28% for recruits with a score of 18 (Grönqvist & Lindqvist, 2016). Because of the fuzzy RD design, the authors used two-stage least squares to estimate the relationship between receiving officer training and attaining a civil leadership position after the military service. Their results indicate that officer training clearly influences the attainment of a civil leadership position. Individuals who received the officer training have a 75% higher likelihood of attaining a civil leadership position compared to the controls. Overall, the study provides causal evidence for the effectiveness of general leadership training.

To sum up, the three examples show that both the sharp and the fuzzy RD designs can provide answers to important questions in leadership research. The studies were conducted in a variety of contexts (e.g., schools, military, public administration) and used very different assignment variables (e.g., age, voting margins, test scores). However, all three studies exploited the almost random assignment of units near the cut-off point for causal inference.

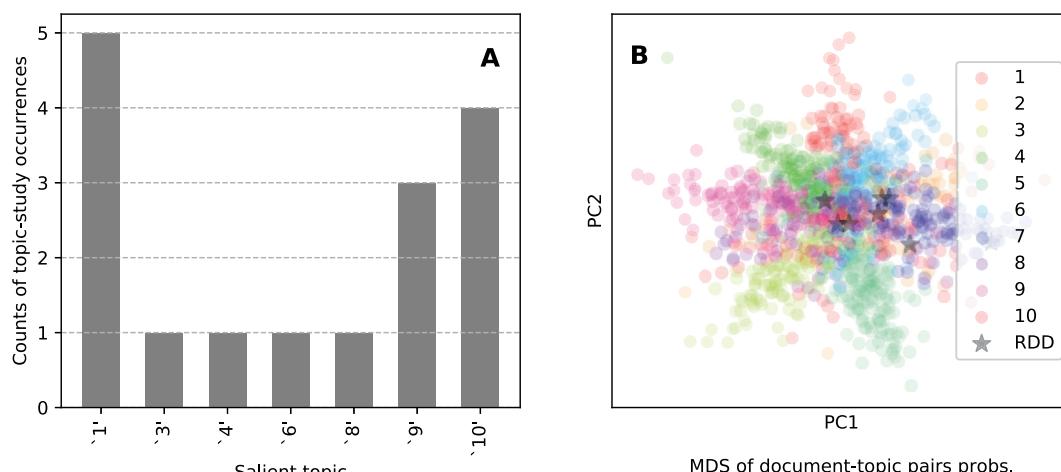


Fig. 7. Regression discontinuity designs — topic characterization. *Notes.* Panel A pictorially depicts the information reported in Table 4; Panel B: Data points marked with a star denote natural experiments that are folded in the topic model trained on the 1156 articles published in The Leadership Quarterly; Topic labels: Topic 1 — 'female leadership'; Topic 2 — 'emotions and leadership'; Topic 3 — 'transformational leadership'; Topic 4 — 'development of leadership'; Topic 5 — '(neo-) charismatic leadership'; Topic 6 — 'cognition and leadership'; Topic 7 — 'strategic leadership'; Topic 8 — 'ethical leadership'; Topic 9 — 'nature of managerial work'; Topic 10 — 'leadership in teams and decision group.' 'MDS' stands for multidimensional scaling; 'PC1' and 'PC2' refer to the components returned from the MDS analysis.

Natural experiments in leadership research: guidelines

Our review of studies from various leadership-related disciplines, including economics, business and management, political sciences, and social sciences, suggests that natural experiments are very effective in identifying causal relationships. This section provides some guidelines on further facilitating the use of natural experiments in leadership research. The key phases of the research design are presented, starting with the discovery of a natural experiment moving on to the actual form of the natural experiment, and then finishing with the statistical analysis.

Discovering natural experiments

A major challenge for leadership scholars is to discover natural experiments. Unlike laboratory and field experiments, researchers cannot actually design natural experiments. Instead, they need to discover contexts in which a random or as-if random variation has taken place. Discovering these contexts is difficult. For instance, Dunning (2012, p. 41) argues that discovering natural experiments is ‘as much art as science.’

We believe a good way to discover natural experiments is by learning from prior examples. Firstly, novel research questions can often be answered by re-using a known/established natural experiment. For example, the natural experiment of the German reunification has been exploited to analyze several research questions, such as the impact of income on health (e.g., Frijters, Haisken-DeNew, & Shields, 2005), the transmission of preferences for entrepreneurship from parents to children (e.g., Wyrwich, 2015), or the legitimization of inequality (e.g., Haack & Sieweke, 2018). Secondly, even when known/established experiments may not be perfect for addressing a new research question, by analogical reasoning, researchers can be inspired by such experiments and discover more appropriate naturally-occurring events for their research question.

Tables 5, 6, and 7 summarize the research questions, exogenous variations, and treatments of each individual study included in our review. Regarding standard natural experiments (see Table 5), many studies have exploited the introduction of new laws or regulations, such as a legal reform in Sweden that discontinued the conferral of state orders of merit (Siming, 2016), or new anti-takeover legislation (Cheng et al., 2005). Others have used laws that set certain quotas, such as the proportion of women on the boards of Norwegian firms (Matsa & Miller, 2013), or that reserved leadership positions for members of minorities in randomly selected villages (Beaman et al., 2012). Finally, some studies leverage sudden, exogenous events, such as earthquakes (Belloc et al., 2016), the successful assassination of political leaders (Shea & Solis, 2018), or the division of Germany into two states after 1945 (Wyrwich, 2015).

Instrumental variables (see Table 6) can be categorized into four main groups: i) macro-level variables pertaining to cultural, institutional, or societal properties, such as the degree of religious piety within a population (Chintrakarn et al., 2017) or the ratio of voters in favor of divorce within a region (Amore et al., 2017); ii) random or as-if random events, such as the gender of a CEO’s first born child (Bennedsen et al., 2007) or the proportion of a firm’s founders that are dead (Adams et al., 2009); iii) spatial distance or related variables, e.g., the distance of companies from executive recruiting firms (Akyol & Cohen, 2013) or the existence and intensity of one-stop flight connections between the locations of potential director home addresses and firm headquarters (Bernile et al., 2018); and finally iv) personal or team attributes, such as CEO age and tenure (Driver & Guedes, 2017) or board size (Kılıç & Kuzyey, 2016).

Concerning the RD design (see Table 7), the highest number of studies focus on the margin of victory in an election as an assignment variable (e.g., Arvate et al., 2018; Boas & Hidalgo, 2011). These studies exploit the fact that in close elections, the assignment of individuals to

the leader position is almost random.

Ultimately, scholars have discovered natural experiments in a variety of leadership-related contexts and we recommend leadership scholars to analyze whether their research questions can be analyzed using the same natural experiment. Furthermore, leadership scholars may focus on current or historical institutional changes (e.g., the introduction of new laws) or try to identify contexts in which assignment to training, jobs, or ranks are based on or influenced by a unit’s score on an observed variable to identify a new natural experimental context.

Deciding about the form of the natural experiment

Once an exogenous, naturally-occurring variation has been discovered, scholars need to decide the form of natural experiment to adopt. This choice is key to a design’s internal validity as standard natural experiments, IV, and RD designs build on specific assumptions about the mechanisms that are presumed to generate the observed data (Dunning, 2012; Imbens & Wooldridge, 2009). Our decision tree (Fig. 8) is designed to help scholars select the most suitable research design.

The first question leadership scholars need to answer concerns the assignment process: is the assignment of units to the treatment truly random, ‘as-if random’ (i.e., the assignment process resembles a true randomization, Dunning, 2012), or non-random? Although a true randomization is a hallmark of laboratory and field experiments (Podsakoff & Podsakoff, 2019), it is seldom found in natural experiments — except for studies that use lotteries (e.g., Angrist, 1990).

In fact, most natural experiments are characterized by an as-if random assignment. The as-if random assignment poses some challenges for leadership scholars, because they need to evaluate the quality of the as-if randomization; that is, the extent to which it is plausible to assume that the assignment process (closely) resembles a true randomization. Dunning (2012) recommends assessing the quality of the as-if randomization based on three criteria. First, researchers should investigate whether units had *information* that they would or would not receive the treatment. Second, researchers need to check whether units had *incentives* to self-select into the treatment group or control group. Third, researchers should analyze whether not only units had incentives but also *capacity* to self-select into a treatment status. For the assessment, Dunning (2012) suggests using both qualitative evidence (e.g., documents, interviews) and quantitative evidence (e.g., balance tests).

Jones and Olken (2005), for example, jointly used qualitative and quantitative evidence to evaluate the plausibility of as-if randomization. They used qualitative evidence, such as leaders’ biographies, to determine whether the nature of death of political leaders was truly exogenous (e.g., due to health issues or accidents). At the same time, they provide quantitative evidence, such as the result of a logistic regression, to back up the assumption that economic conditions do not predict the death of political leaders.

If the assignment process is random or as-if random, then researchers need to check the second question: are units allowed to change their treatment status, moving from the treatment (control) to the control (treatment) group? This check is important, because units that comply with the assignment (‘compliers’) probably differ from units that do not comply with the assignment (‘non-compliers’). For instance, in Angrist’s (1990) study on the effect of military service on lifetime earnings, subjects were assigned to the treatment (military service) and control group (no military service) based on their date of birth and the result of a draft lottery. However, some subjects who were eligible based on the result of the lottery did not serve in the military, because they went to college or moved outside the U.S. We can assume that these non-compliers differ from the compliers (i.e., those citizens who were eligible and did serve and those who were not eligible and did not serve in the military) regarding knowledge, values, attitudes etc., and that these differences are probably correlated with their lifetime earnings. Therefore, leadership scholars should, if possible, focus

Table 5

Standard natural experiments — research questions, exogenous variations, and treatments.

Authors	Research question	Context	Exogenous variation	Treatment
Bae and Yi (2008)	Do mutual fund managers time the market?	Equity mutual funds	Introduction of the “short-short rule” for mutual funds	The short-short rule hinders mutual fund managers from timing the market
Bækgaard (2011)	Whether and how two different organizational leadership models affect the interaction between politicians and administrators	Danish municipalities	Amalgamation of 232 municipalities into 65 new municipalities	Decision to use different administrative leadership models
Beaman et al. (2012)	Does growing up under female leadership raises aspirations and educational attainment for girls?	Indian Villages	Law that reserves the chief councilor position for women in a random sample of villages	Female leader
Belloc et al. (2016)	Do natural catastrophes impact the stability of institutional regimes?	Medieval Italian cities	Earthquakes	Earthquakes interpreted as manifestation of God's outrage
Bhavnani (2017)	Do the effects of temporary ethnic group quotas persist?	Indian Villages	Quasi-random declaration of reserved seats to be “open” in elections in 1974 and 2008	Discontinuation of ethnic group quotas
Breda and Ly (2015)	Does the level of male-domination influence gender bias?	French higher education	Examiners in oral examinations are aware of the candidate's gender, whereas examiners are unaware of the gender in written exams	Proportion of women among professors within a scientific field
Brockman et al. (2015)	Does CEO compensation risk influences managers' risk-seeking behavior?	U.S. public corporations	Passage of FAS 123R	Reduction in CEO compensation risk level
Byrd et al. (2012)	Which governance mechanisms are associated with firm survival and failure?	U.S. firms	Thrift crisis of the late 1980s	Unitary leadership (single CEO/Chairman) vs. dual leadership (two leaders)
Chauchard (2014)	Can descriptive representation for a stigmatized group change the beliefs and intentions of members of dominant groups?	Indian villages	Discontinuity in the implementation of reservation of political leadership positions for minorities	Members of stigmatized groups hold political leadership positions
Chen et al. (2016)	Do controlling shareholders hold CEOs accountable to corporate fraud behavior?	Chinese companies	Split Share Structure Reform in China	Greater incentive for powerful shareholders to monitor managers
Cheng et al. (2005)	What value do managers place on the control rights conferred by stock ownership?	U.S. companies	Introduction of second-generation anti-takeover legislation	Weakening of outsiders' takeover power
Cohen and Wang (2013)	Do staggered boards negatively affect firm value?	Firms in Delaware	Unexpected court rulings in Delaware that affected for a subset of firms the extent to which staggered boards can impede shareholders seeking to replace a majority of directors	Weakening of the anti-takeover force of staggered boards
Coman (2018)	How does the party affiliation of local elites influence the distribution of central government funds to territorial units?	Romania	2008 Romanian electoral reform	Change from a closed-list proportional system to a system that requires all members of the parliament to run in single-member districts
Cox et al. (2000)	Does politicians' career goals influence their decision to join a faction?	Japanese bicameral parliament	Different electoral rules in the two houses of the Japanese parliament	Lower level of electoral competition when politicians' join a faction
Cuñat and Guadalupe (2009)	Do deregulation and increased product market competition influence the compensation packages that firms offer to their executives?	U.S. financial sector	Deregulation laws that reduced entry barriers into the financial sector	Increased product market competition
Dahya and McConnell (2005)	Do boards with significant outside directors make different decisions than boards dominated by inside directors?	U.K. firms	Publication of the “Cadbury Report” which coerced firms into adding outside directors	Appointment of outside directors
de Paola and Scoppa (2015)	Is gender discrimination affected by the gender of evaluators?	Italian universities	Random assignment of evaluators	Degree of committee gender composition
de Paola et al. (2010)	Do gender quotas influence women involvement in political activity?	Italian local administration	Some municipalities did not vote under the gender quota regime	Gender quotas
Gittell et al. (2008)	Does job design affect the coordination of work?	Massachusetts hospital	Some patients were assigned to hospitalist physicians while others remained under the care of their own private practice physicians	Stage- and site-based specialization
Gormley et al. (2012)	How do boards adjust incentives in response to firms' risk and how do these incentives affect managers' risk-taking?	U.S. listed corporations	Workers being exposed to chemicals that have just been found to be toxic	Increase in left-tail risk (i.e., material risk)
Guadalupe and Wulf (2010)	Does product market competition influence organizational design?	large U.S. firms	Canada-United States Free Trade Agreement of 1989	Increase in competition
Han and Zhang (2018)	What is the net effect of a politically connected board for firms?	Chinese companies	Regulatory change in China	Bureaucrats were forbidden from sitting on the board of public firms
Hidalgo et al. (2016)	Does auditor appointment affect political accountability?	Brazilian state audit courts	Variation in the appointment mechanisms for choosing auditors	Auditors insulated from political influence

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Table 5 (continued)

Authors	Research question	Context	Exogenous variation	Treatment
Huber and Arceneaux (2007)	Do presidential campaign advertisements mobilize, inform, or persuade citizens?	U.S. presidential elections	Some individuals living in non-battleground states accidentally received different advertisement because they resided in a media market adjoining a competitive state. Collapse of Arthur Andersen	High levels or one-sided barrages of campaign advertisements
Jayaraman and Milbourn (2015)	Do CEO equity incentives influence financial misreporting?	U.S. public corporations		Level of auditor expertise
Jiraporn and Lee (2018)	How do co-opted directors affect dividend policy?	U.S. public corporations	Passage of the Sarbanes–Oxley Act	Increase in board independence
Jiraporn et al. (2018)	Do independent directors influence corporate innovation?	U.S. public corporations	Passage of the Sarbanes–Oxley Act	Increase in board independence
Kahn et al. (2015)	Do shifts in evaluating local officials for promotion affect their efforts to reduce water pollution?	Chinese municipalities	Change in the local political promotion criteria	Higher incentives for local political leaders to reduce border pollution
Knott (2001)	Does hierarchy provide a dynamic advantage? Having self-employed parents who encountered a great deal of resistance due to their self-employment	Quick-printing industry	Establishments leave a franchise system	Establishments lose their hierarchical manager
Laustsen and Petersen (2017)	Are political candidates and leaders with dominant, masculine physical features more preferred under conditions of conflict than of cooperation?	Poland and Ukraine	Crimea crisis in 2014	Condition of conflict
Matsa and Miller (2013) Poulos (2019)	Does female leadership affect corporate decision making? Does personal wealth cause individuals to select into public office?	Norwegian listed firms Georgia	Law that sets a quota for women in the board of directors 1805 and 1807 Georgia land lotteries	Increase of female leaders Increase in wealth due to lottery
Rickman and Witt (2008) Shea and Solis (2018) Siming (2016)	Do principals who exercise favouritism towards certain agents harm other agents? Does leader tenure influence country's creditworthiness? Do orders of merit function as an external form of perquisite through which the government can supplement the compensation given by a publicly listed firm to the CEO?	English soccer Cross-country analysis Swedish companies	Introduction of professional referees to the English Premier League Successful executive assassination 1974 legal reform in Sweden	A group of referees was retained for the whole soccer season on a full salary Leader death Discontinuing the conferral of orders of merit to citizens
Tabvuma et al. (2014)	Does change in political leadership influence job satisfaction in the public sector?	British public sector	Change in the political party which is governing at the national level	The ruling political party matches the political preference of the public sector employee
Tosun (2016)	Do CEO option compensation changes influence firm leverage changes?	U.S. public corporations	Internal Revenue Code 162(m) tax law	Increased option compensation for CEOs
Valdini (2012)	Do electoral systems affect candidate selection, especially female political leaders?	Elections in Japan	Electoral reforms of the Japanese House of Representatives in 1994	Move towards a greater orientation towards issues and parties
Vo and Canil (2019)	Is CEO pay disparity due to efficient contracting or CEO power?	U.S. public corporations	Introduction of FASB ASC 718 in 2005	All accounting benefits associated with option grants were removed
Wyrwich (2015)	Do parents transmit preferences for entrepreneurship to their children?	Entrepreneurs in Germany	German divide in 1945 which leads to some parents of entrepreneurs growing up in a socialist country	Having self-employed parents who encountered a great deal of resistance due to their self-employment

Table 6

Instrumental variable designs—research questions, exogenous variations, and treatments.

Authors	Research question	Context	Exogenous variation	Treatment
Adams et al. (2009)	Do founder-CEOs influence firm performance?	Family firms	(1) proportion of the firm's founders that are dead; (2) number of people who founded the company	Founder-CEO
Adhikari (2018)	Do firms led by female top executives hold more cash?	U.S. listed companies	Fraction of registered men between the ages of 18 and 44 who were drafted or enlisted for WWII in a state	Number of female executives
Adkins et al. (2007)	Do managerial compensation and ownership influence the use of foreign-exchange derivatives by U.S. bank holding companies	Large bank holding companies	(1) number of employees, (2) number of subsidiaries; (3) number of offices; (4) CEO age; (5) 12 month maturity mismatch; (6) market-to-book ratio; (7) foreign interest income dummy	Managerial compensation and ownership
Aghion et al. (2013)	Does institutional ownership influence firm innovation?	S&P 500 firms	Firms' addition to the S&P 500 index	Institutional ownership
Akyol and Cohen (2013)	Does the use of executive search firms for board member search influence corporate governance?	U.S. public corporations	Geographic distance of companies to executive search firms	Use of executive search firms
Amore et al. (2017)	Does leadership by couples affect the profitability of family firms?	Italian family firms	Regional ratio of voters in favor of divorce	Leadership by couples
Amore et al. (2014)	Do gender interactions at the top of the corporate hierarchy affect firm performance?	Italian family firms	(1) gender composition of the pool of potential family heirs; (2) geographic variations in gender stereotypes	Gender interactions
Arora (2018)	Does the effort of financially linked independent directors enable firms to reemerge from bankruptcy?	U.S. firms	(1) Board meeting fees; (2) prime interest rate movement; (3) board size	Effort of financially linked independent directors
Artz et al. (2017)	Does the competence of supervisors influence the quality of employees' lives?	U.S. and U.K. employees	(1) whether the supervisor has a college degree; (2) whether the supervisor worked his or her way up in the organization	Supervisor competence
Azoulay et al. (2017)	Do young scientists adopt their advisers' orientations towards commercial science?	Academics from the U.S.	(1) proximity between scholars' undergraduate institutions and the universities where they might become postdoctoral fellows; (2) shared nationality between the scholar and a potential mentor	Social matching
Barros and Nunes (2007)	Which factors influence pay and performance of CEOs?	Portuguese non-profit organizations	(1) number of stockholders in the company; (2) father's education	Board composition
Bennedsen et al. (2007)	Does the appointment of family CEOs negatively affect firm performance?	Danish family firms	Gender of CEO's first born child	Hiring of an external CEO
Bernile et al. (2018)	Does board diversity influence corporate policies and risk?	North American listed companies	Existence and intensity of one-stop flight connections between the locations of potential director home addresses and firm headquarters	Board diversity
Chen et al. (2017)	Does gender diversity in boardrooms influence dividend payouts?	S&P 1500	(1) fraction of male directors linked to female directors; (2) female to male labor force participation ratio	Board gender diversity
Chintrakarn et al. (2017)	Does religious piety substitute for corporate governance?	U.S. firms	degree of religious piety in the past in the population surrounding a corporate headquarter	Current religious piety in the population surrounding a corporate headquarter
Conroy and Weiler (2016)	Does female ownership influence firm performance?	U.S. startups	(1) change in divorce rate; (2) growth in female labor force participation	Female owner
Conyon and He (2017)	Does gender diversity in boardrooms influence firm performance?	U.S. firms	Percentage of female residents in the U.S. state where the given company has its headquarter	Board gender diversity
Dal Bó et al. (2009)	Why do political dynasties persist?	U.S. congress	Successful first reelection attempt	Long tenure in power
Dasgupta (2018)	Does technological change contribute to political turnover?	Indian agriculture	Share of district land with a naturally occurring aquifer interacted with a dummy variable that "switches on" for all districts with the introduction of HYV crops	Technological change
Delis et al. (2017)	Do board members from countries with different genetic diversity levels influence corporate performance?	North American and U.K. listed companies	(1) migratory distance from East Africa; (2) the level of ultraviolet exposure in the directors' country of nationality	Genetic diversity within a country
(Driver & Guedes, 2017)	Is R&D expenditure reduced in cases of imminent departure of the CEO?	U.K. service and manufacturing firms	(1) CEO age; (2) CEO tenure; (3) profit shock	CEO departure
Frantz and Stein (2017)	Do institutionalized leadership succession rules influence the likelihood that dictators confront coups?	Dictatorships	A regime took power at independence	Institutionalized leadership succession rules
Gabel and Scheve (2007)	To what extent does elite opinion about policy shape public opinion?	European countries	Change in electoral laws	Elite polarization
Harjoto and Rossi (2019)	Do religiosity and female representation on the board influence corporate social responsibility?	Italian listed companies	(1) number of words in the encyclicals and other writings that are related to "religiosity"; (2) number of words in the encyclicals that are related to gender diversity	Religiosity in the population and women on the board of directors
Hearn and Filatotchev (2019)	Does private equity ownership influence the probability of the founder's retention as CEO?	IPOs in emerging markets	Numbers of private equity investors	Private equity ownership

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Table 6 (continued)

Authors	Research question	Context	Exogenous variation	Treatment
Hooghiemstra et al. (2017)	Does 'readability' of a remuneration report influence the level of shareholder say-on-pay voting?	U.K.-listed firms	Readability of CEO letter	Readability of remuneration report
Izgi and Akkaş (2012)	Does top management gender diversity influence firm performance?	Turkish firms	(1) CEO MBA; (2) Big 4 Audit	Female CEO
Khwaja (2009)	Can project design compensate for community-specific constraints in social capital?	Community-maintained infrastructure projects in Northern Pakistan	Characteristics of hereditary leader households (e.g., does the leader household has a young and healthy male member?)	Having a project leader
Kılıç and Kuzey (2016)	Does gender diversity in boardrooms improve firms' economic performance?	Turkish listed companies	(1) board size; (2) board independence; (3) firm size; (4) leverage	Board gender diversity
Li et al. (2018)	Does superior environmental, social and corporate governance disclosure affect firm value?	FTSE 350 firms	Firm-level initial value of the ESG disclosure score	Environmental, social and corporate governance disclosure
Lin et al. (2011)	Do managerial incentives and CEO characteristics influence a firm's innovation activities?	Chinese manufacturing firms	Industry-location averages	Provision of managerial incentive schemes
Markussen and Røed (2017)	Do gendered peer influences affect early career entrepreneurship?	Norwegian entrepreneurs	Entrepreneurship activity among the schoolmates' parents	Peer influences
Nicolosi and Yore (2015)	Does a CEO's marital status influence their firm's investment and compensation policies	S&P 1500	Religious CEO	CEO marital status
Pascal et al. (2017)	Does a CEO's business education influence the financial and social performance of microfinance institutions?	Global microfinance institutions	Microfinance institution age	CEO business education
Rouse (2012)	Does high school leadership affect subsequent educational attainment?	U.S. high schools	(1) school-level measure of leadership opportunities; (2) oldest child in the family	High school leadership
Sabatier (2015)	Does gender diversity in boardrooms improve firms' economic performance?	French publicly listed companies	Average ratio of women in connected boardrooms	Board gender diversity
Shue and Townsend (2017)	Does an increase in stock option grants affect CEO risk-taking?	North American listed companies	(1) whether each CEO-year is predicted to be the first year of a new fixed-value cycle; (2) variation in the value of options granted within fixed-number and fixed-value cycles	Increase in stock option grants
Sun and Hovey (2013)	Does executive compensation influence management discretionary behavior over financial reporting?	Australian Securities Exchange (ASX) listed companies	Median value of discretionary accruals for a portfolio of firms	Executive compensation
de Vries (2012)	Does personality influence leadership styles?	Large municipality organization	Different-source personality ratings	Leader personality
Wu (2015)	Does inequality influence trade openness in authoritarian regimes?	Authoritarian regimes	Ratio between two age groups	Income inequality
Yang et al. (2019)	Do networks influence persons' placement into leadership positions of varying levels of authority	MBA programme	degree of expose to same-gender classmates from other home sections	Composition of students' inner circle

Table 7
Regression discontinuity designs — research questions, exogenous variations, and treatments.

Authors	Research question	Context	Exogenous variation	Treatment
Arvate et al. (2018)	Do female leaders harm the career of female followers?	Mayoral elections in Brazil	Margin of victory in election	Female leader
Boas and Hidalgo (2011)	Does incumbency influence politicians' ability to control the media and does media control affect their future electoral prospects?	Elections in Brazil	Margin of victory in election	Incumbency
Butler (2009)	Does the incumbency advantage enjoyed by freshmen differ from the incumbency advantage enjoyed by non-freshmen incumbents?	U.S. house elections	Margin of victory in previous election	Incumbency
Dal Bó et al. (2009)	Why do political dynasties persist?	U.S. congress elections	Margin of victory in election	Long tenure in power
Dunning and Nilekani (2013)	Do ethnic quotas induce distribution of material benefits to members of disadvantaged groups?	Elections in India	Proportion of the local population comprised of marginalized castes or tribes	Reserved seats in the council for members of minorities
Grönqvist and Lindqvist (2016)	Does training during the Swedish military service influence the probability of attaining a civil leadership position?	Swedish army	Score on a cognitive ability test	Received military officer training
Heck and Moriyama (2010)	Does school leadership influence students' educational performance?	School	Student age	Additional year of schooling
Lechner and McNamee (2018)	Does colonial rule influence support for democracy?	Namibia	Location of the Police Zone boundary	Form of colonial rule

on the compliers in their analysis (Dunning, 2012) or should try to estimate the ratio of compliers within a population (see, e.g., Angrist, 1990).

If researchers answer the first question positively (i.e., random or as-if random assignment) while negatively answering the second one (i.e., change of treatment status), then the natural experiment at hand represents a standard natural experiment, whose data can be analyzed either using Neyman's potential outcome framework or by adopting model-based adjustments (we discuss the analysis in more detail below). If both answers are positive, then the natural experiment is an IV design.

If the assignment to the treatment is neither random nor as-if random, then leadership researchers need to check whether a unit's score on an observed variable influences the assignment. An assignment based on a unit's score on a covariate is a hallmark of the RD design. The assignment may take two forms (Lee & Lemieux, 2010). First, in the sharp RD design, a unit's score on a covariate determines the assignment. For instance, in the study by Arvate et al. (2018), the assignment of women to political leadership positions was determined by their share of votes in mayoral elections. Second, in the fuzzy RD design, a unit's score on a covariate affects the probability of receiving the treatment. For instance, in Grönqvist and Lindqvist's (2016) study, a person's score on a cognitive test influenced the probability of receiving leadership training.

Finally, if the assignment to the treatment is not based on a unit's score on an observed variable, then leadership researchers need to determine whether they exploit an exogenous source of variation that they can use to approximate an as-if random treatment. If they answer 'yes' to the questions, then this exogenous source of variation represents an instrument and the natural experiment can be classified as an IV design. For instance, in the study by Bennedsen et al. (2007), the hiring of a family CEO versus an external CEO is neither random nor as-if random. However, the authors use an exogenous source of variation — the gender of the firstborn child as an instrument to estimate the causal effect of hiring professional managers on firm performance. If researchers cannot exploit such an exogenous source of variation, then their context represents a correlational design, which does not support causal inference.

Analyzing natural experiments

After leadership scholars have determined the form of the natural experiment, they need to analyze the experiment. Although the different forms may require different types of data analysis, simplicity and transparency are the underlying factors (Dunning, 2012). Simplicity means that leadership scholars do not necessarily need to apply complex statistical techniques to analyze natural experiment data. A simple difference-of-means or difference-of-proportions test is often sufficient to estimate the average causal effect of the treatment. Simplicity in data analysis also generally implies greater transparency. For instance, difference-of-means or difference-of-percentages tests provide a more transparent estimate of the average causal effect than multivariate regression models that contain several covariates. Although researchers cannot always follow these principles due to the specific circumstances of a natural experiment and they need to use model-based adjustments, such as including covariates or adjusting standard errors, we believe that they should consider the general principles and prefer 'simpler' models over more complex ones.

Analyzing standard natural experiments

Estimation of the average causal effect in the standard natural experiment. The analysis of standard natural experiments is reasonably simple. Since the assignment of units to the treatment is random or as-if random, it is possible to infer a causal effect within

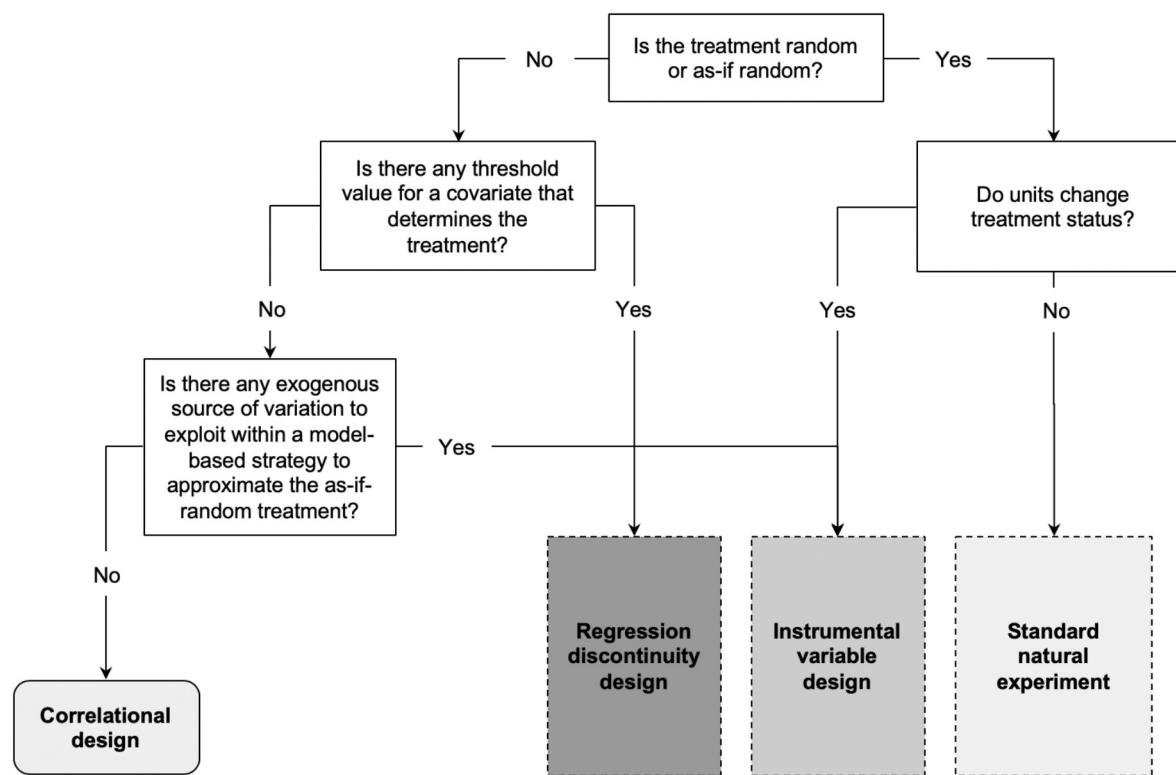


Fig. 8. Decision tree linking treatment attributes, assumptions, and forms of natural experiments.

Neyman's potential outcome framework (also called the Neyman-Rubin model; see Rubin, 2005). Neyman's framework is both simple and transparent (Dunning, 2012). Scholars may want to use the difference-of-means or difference-of-proportion tests that are widely applied in laboratory experiments. Therefore, either a *t*-test(for smaller sample sizes) or *z*-test(for larger sample sizes, see Dunning, 2012) could suffice to conduct causal research with observational data.

Alternatively, a regression-based approach could be desirable when qualitative evidence and/or institutional knowledge on the part of the researchers indicate the treatment may not be random or as-if random. Such an analytical strategy would enable a comparison between the findings from the difference-of-means or difference-of-percentages test with the estimates obtained through a multivariate regression containing the covariates that are presumed to correlate with the treatment. In the regression-based approach, the population regression function is:

$$y = \beta X + \gamma t + \lambda D + \delta tD + u \quad (1)$$

In Eq. (1), β represents the coefficient for a vector of covariates X ; γ represents the coefficient for the time trend common for treatment and control group; λ represents the systematic difference in the outcome across the treated and the control cases (group-specific time-invariant difference); and δ represents the coefficient for the interaction of the group and time variable, which estimates the average causal effect of the treatment on the outcome y ; and u represents the error term (Imbens & Wooldridge, 2009).

Plausibility of the assumptions of the standard natural experiment. The analysis of the standard natural experiment using the Neyman framework builds on two assumptions. First, units are randomly or as-if randomly assigned to the treatment. In order to provide evidence of the quality of the (as-if) randomization, Dunning (2012) recommends

conducting balance tests. Currently, many researchers use mean-difference tests (*t*-tests) to analyze variations between units in the treatment and control group along relevant pre-treatment covariates. However, this approach is sensitive to the sample size, i.e., even small differences become statistically significant if the sample size is large. To reduce this problem, scholars can use normalized differences, which are unaffected by sample size (for a detailed discussion of how to calculate the normalized differences, see Imbens & Wooldridge, 2009). A further disadvantage of mean-difference tests is that it is difficult to determine whether the control and treatment groups are balanced. For instance, if researchers conduct *t*-tests for 20 covariates, we would expect to find at least one statistically significant difference simply as the result of chance. Therefore, we suggest conducting joint hypothesis tests, for example by regressing the binary treatment variable on the covariates and using a χ^2 test to analyze whether the coefficient of the covariates differs from zero (McKenzie, 2015).

Second, the Neyman framework builds on the assumption that the outcomes of a unit are only influenced by the unit's treatment-assignment status. This assumption is also called the noninterference assumption or the "stable unit treatment value assumption (SUTVA)" (Imbens & Rubin, 2015). SUTVA refers to a situation in which the treatment status of other units affects a unit's outcome. For instance, a company aims to analyze whether leadership training increases the effectiveness of their leaders. For this reason, the company assigns some leaders to a leadership training programme (treatment group), whereas other leaders receive no training (control group). However, because leaders work together within the same company and interact with each other, leaders in the treatment group may share some of the knowledge they learned in the training programme with leaders in the control group. This spillover violates the SUTVA and leads to an underestimated average causal effect (Morgan & Winship, 2015). Unfortunately, there is currently no clear solution to SUTVA violations,

though [Belloc et al. \(2016\)](#) used corrected standard errors to deal with such possible violations, and [Selb and Munzert \(2018\)](#) excluded units in the control group which were in close spatial proximity to treated units, because these units were particularly likely to be treated by accident.

Since there is no ‘solution’ to the SUTVA violation, we recommend that (i) both the statistically adjusted and unadjusted estimation results are reported, as this may provide insights into the extent to which a possible SUTVA violation affects the results, and (ii) the role of social interactions needs to be explicitly taken into account, which could reveal important boundary conditions for the effect under examination (see [Sinclair, 2011](#)).

Testing the robustness of the results of the standard natural experiment. There are several options to test the robustness of the results of a standard natural experiment. Firstly, the results can be tested for robustness if they include pre-treatment covariates in the analysis. For instance, [Beaman et al. \(2012\)](#) showed the results of both difference-in-means tests and ordinary least squares coefficients adjusted for covariates despite random assignment of women to a leadership position. Although the inclusion of covariates is unlikely to have a high impact on the average causal effect in a natural experiment with high plausibility of as-if random assignment, adding covariates – especially those that are unbalanced between the treatment and control group – increases the transparency and credibility of the results in the eyes of other researchers. Therefore, the best approach is to estimate the average causal effect with and without covariates and if there are significant differences then potential reasons for these differences should be explored in more detail.

Secondly, if the passing of a new law, regulation or quota is at the basis of the experiment, then [Matsa and Miller's \(2013\)](#) approach should be followed, i.e., by conducting additional tests for different types of units — e.g., units that almost complied with a quota or law before the inception, and units that had a large distance from compliance. Matsa and Miller argue that they would expect greater effects for firms with a greater distance from compliance with the gender quota than for firms that almost complied with the quota. Such an additional test is important because it can provide further evidence that the observed effect is caused by the new law, regulation, or quota and not by an unrecognized event that affected the units in the treatment group.

Thirdly, [Matsa and Miller \(2013\)](#) also use matching methods (e.g., propensity score matching). Matching methods should be used if units in the treatment and control group differ from each other with regard to several (observable) covariates. The covariates can be used to match treated units with control units that are highly similar with regard to the observed covariates. Although matching methods are no replacement for an as-if randomization, because they do not ensure that units in the treatment and control groups do not differ with regard to observed and unobserved covariates, these methods can provide further insights into the robustness of the initial results.

Analyzing instrumental variable designs

Estimation of the average causal effect in the IV design. In the IV design (see [Fig. 4](#)), we estimate the causal effect of an endogenous treatment variable D by identifying an instrument Z that affects D but is otherwise unrelated to the outcome y ([Abadie & Cattaneo, 2018](#)). The key idea of the IV design is that we only retain the variation in the treatment that is caused by an exogenous variation in the instrument, while ruling out the association between the treatment and possible covariates A and B (see [Fig. 4](#)). For instance, in his study on the effects of military service on future earnings, [Angrist \(1990\)](#) isolates the variation in the treatment (i.e., military service) that was caused by an exogenous variation (i.e., Vietnam draft lottery) of the instrument (i.e., eligibility of being drafted for military service).

The Wald estimator is the simplest and most transparent way to

estimate the average causal effect in the IV design ([Dunning, 2012](#)):

$$\rho = \frac{E[Y_i|Z_i = 1] - E[Y_i|Z_i = 0]}{E[D_i|Z_i = 1] - E[D_i|Z_i = 0]} \quad (2)$$

The IV estimate ρ in Eq. (2) equals the difference in the outcome variable between treated $E[Y_i|Z_i = 1]$ and $E[Y_i|Z_i = 0]$ controls divided by the ratio between treated $E[D_i|Z_i = 1]$ and controls $E[D_i|Z_i = 0]$. Such an equation provides some first insights into the IV estimate ρ .

While the Wald estimator should be applied for estimations with a single instrument without any covariates, researchers recommend using the two-staged least squares (2SLS) estimator for multiple instruments or when covariates are added ([Angrist & Pischke, 2009](#)). In the latter case, we use two steps to estimate the causal effect of the treatment. In the first-stage (Eq. (3)), we regress the treatment variable D on a vector of covariates X and on the exogenous instrument Z :

$$D = \gamma_1 X + \gamma_2 Z + v \quad (3)$$

In the second-stage (Eq. (4)), we regress the outcome variable (Y) on the covariates (X) and predicted values of the treatment from the first-stage regression:

$$y = \beta_1 X + \beta_2 \hat{D} + u \quad (4)$$

where β_2 denotes the average causal effect of the treatment.

Evaluation of the plausibility of the assumptions of the IV design. The IV design relies on several assumptions. In line with [Angrist and Pischke \(2009\)](#), we emphasize the following elements: (i) exogeneity of the instrument; (ii) relevance of the instrument; and (iii) the exclusion restriction.¹¹ The first assumption – exogeneity of the instrument – means that the instrument is uncorrelated with the error term u , included in Eq. (4). In other words, the instrument is assumed not to be related to the causes of the dependent variable ([Sovey & Green, 2011](#)). Arguing this assumption is consistent with a target population regression function, and the dataset at hand is particularly problematic. In fact, it is not possible to empirically test the exogeneity of an instrument ([Wooldridge, 2009](#)). Furthermore, recent simulation studies indicate that endogenous instruments produce causal effect estimates “that are inferior to those reported by OLS regression” ([Semadeni et al., 2014](#), p. 1071). These concerns become less accentuated when units are randomly assigned to the instrument ([Dunning, 2012](#)), as in the case of lotteries ([Angrist, 1990](#)). Even if the assignment is not truly random, one can still argue for the exogeneity of the instrument. For instance, [Bennedsen et al. \(2007\)](#) point out that their instrument – the gender of the firstborn child – is as-if random and they expand on qualitative evidence by observing that technologies to identify the child's gender before the birth were not widespread at the time, so that abortion due to the child's gender was unlikely. These arguments provide convincing evidence for the exogeneity of the instrument, despite the lack of a direct test.

The second assumption – the relevance of the instrument – implies that Z and D are correlated. Specifically, instruments can be categorized into weak, moderate and strong according to the magnitude of the Z - D correlation. In order to assess an instrument's strength, the canonical test can be used which is based on the F-statistic of the first-stage regression ([Semadeni et al., 2014](#)).¹² Exploiting the canonical test, [Olea and Pflueger \(2013\)](#) developed a weak-instrument test, which is robust to heteroscedasticity, autocorrelation, and clustering, and which is more efficient than the standard [Stock and Yogo \(2005\)](#) test. Strong instruments should be the norm in the IV design, because weak and

¹¹ Please note that assumptions(i) and (iii) are often combined. In the interest of clarity, we follow [Angrist and Pischke \(2009\)](#) and separately consider each assumption.

¹² Interested readers find an overview of critical values for the weak instrument test in [Stock and Yogo \(2005\)](#).

moderate instruments lead to inflated standard errors, although the estimated regression slopes are unbiased (Semadeni et al., 2014).

The third assumption – exclusion restriction – means that Z has no influence on y apart from the effect that is conveyed through D (Sovey & Green, 2011). Similarly to the exogeneity assumption, the exclusion restriction cannot be assessed based on the available data. In fact, it cannot be proved that the instrument – even when it results from a true randomization – does not affect the dependent variable through alternative causal pathways (Morgan & Winship, 2015). Instead, the best approach would be to: (i) critically analyze possible theoretical mechanisms through which the instrument may be related to the dependent variable, and (ii) provide both logical arguments and qualitative evidence that help to rule those mechanisms out (Sovey & Green, 2011).

Testing the robustness of the results of the IV design. Leadership scholars have at least two alternatives to assess the robustness of an IV design's results. First, estimated regression slopes could be compared across models building on alternative instruments. For instance, Chintrakarn et al. (2017) use the degree of religious adherence in the population surrounding a firm's corporate headquarters in 1971 as instrument in their main analyses; then, they provide a second model using a twenty-year lag of the original instrument.

Second, sometimes the instrument influences the assignment to the treatment, whereas it does not capture the timing of the treatment. For instance, Bennedsen et al. (2007) explained that observed differences in firm performance between firms with a family CEO and firms with an outside CEO may also result from differences in the timing of CEO succession (e.g., CEOs may retire at a different age). Therefore, the authors check their initial results by estimating the model on a sub-sample of the data — i.e., the instances in which the CEO transition occurred while the incumbent CEO is in the 'normal' retirement age. They even identified an additional instrument, CEO death, to test whether their findings are robust when the timing of CEO succession is credibly exogenous. These rigorous robustness checks help to rule out alternative explanations for the observed relationships and strengthen the causal inference.

Analyzing regression discontinuity designs

Estimation of the average causal effect. Before starting to analyze the regression discontinuity design, leadership researchers need to check whether the natural experiment represents a sharp or a fuzzy regression discontinuity design. The sharp RD design is characterized by a perfect compliance of the units; that is, all units above the threshold receive the treatment and all units below the threshold are assigned to the control group (or vice versa). In the fuzzy RD design, not all units with a score above the threshold receive the treatment; instead, a score above the threshold merely influences the probability that a unit will receive the treatment (Lee & Lemieux, 2010). Our discussion in this section focuses on the sharp RD design, because the fuzzy RD design has already been discussed in the section "Analyzing instrumental variable designs".¹³

The analysis of the sharp RD design follows the principles of simplicity and transparency (Dunning, 2012). As shown in Fig. 6, we require two variables for the analysis: X and x^* . X represents the assignment variable and X_i represents the score of unit i on the assignment variable; x^* denotes the threshold or cut-off point for the assignment of the treatment. Based on X_i and x^* , we can create a binary treatment variable, tD , that equals 1 if $X_i >= x^*$ and 0 if $X_i < x^*$ (please note that whether the treatment is assigned if $X_i >= x^*$ or $X_i <= x^*$ depends on the empirical context; we assume here that the treatment is assigned if the score on the assignment variable exceeds the threshold). The treatment variable is crucial for determining the discontinuity. The

regression model for the RD design is shown in Eq. (5):

$$y_i = \alpha + \delta tD + \beta(X_i - x^*) + u \quad (5)$$

The crucial quantity of interest is the treatment effect, tD . The coefficient δ indicates the discontinuity at the threshold (x^*), which represents the average causal effect of the treatment (Dunning, 2012). The coefficient β represents the continuous effect of the assignment variable, which is centered around the value of the threshold x^* . Researchers suggested that the slope of the regression should be allowed to differ between the control group and the treatment group (e.g., Antonakis et al., 2010; Lee & Lemieux, 2010) by including an interaction between the treatment variable and the assignment variable as shown in Eq. (6):

$$y_i = \alpha + \delta tD + \beta(X_i - x^*) + \tau tD(X_i - x^*) + u \quad (6)$$

The coefficient τ represents the interaction between the assignment variable and the treatment assignment and indicates whether the slope differs between the control group and the treatment group.

Evaluation the plausibility of the assumptions of the RD design. Compared to the instrumental variable design and the standard natural experiment design, the RD design is based on mild assumptions (Lee & Lemieux, 2010). The crucial assumption underlying the RD design is that units cannot precisely manipulate their score on the assignment variable (Lee & Lemieux, 2010), because it ensures that units close to the threshold are almost randomly assigned to the treatment and the control condition. This assumption cannot be directly validated. However, leadership scholars can conduct various tests that may falsify the assumption. For instance, Arvate et al. (2018) tested (i) the balance on covariates between units closely below and above the threshold, and (ii) the density of the assignment variable.

Firstly, testing the balance on pre-treatment covariates between units closely below and above the threshold provides insights into the quality of the as-if randomization. If units cannot precisely manipulate their score on the assignment variable, we would expect that units closely above the threshold do not systematically differ from units closely below the threshold with regard to pre-treatment covariates (Gattaneo, Idrobo, & Titiunik, 2019). The balance test as described for the standard natural experiment can be used to test the plausibility of the as-if randomization. Although we suggest using different bandwidths around the threshold to check the robustness of the test, leadership scholars should consider that observations in the treatment and control group with a greater distance from the threshold will be more likely to differ from each other than observations close to the threshold.

Secondly, to further check the assumption that units were not able to precisely manipulate their score on the assignment variable, McCrary's (2008) test can be carried out. The test assumes that if units have imprecise control over their score, we would expect to find that the density of the assignment variable would be continuous. Conversely, a jump in the density around the threshold could be a sign of a unit's ability to manipulate the assignment variable (McCrary, 2008). Together, the results of these two tests can help leadership scholars to provide evidence for the validity of the identifying assumption in the RD design.

Testing the robustness of the results of the RD design. A further important step in the RD design is to check the robustness of the results given that various decisions may affect the size of the average causal effect. Specifically, three decisions have received considerable attention in the literature: (i) the inclusion of covariates; (ii) the selection of the bandwidth; and (iii) the inclusion of higher-order polynomials.

First, leadership researchers need to decide whether they should include covariates in the analysis. In RD designs, the inclusion of covariates is not as straightforward as in correlational studies. Due to the as-if random assignment of units into treatment and control groups near the threshold, a consistent estimate of the discontinuity can still be

¹³ Please note that the fuzzy RD design resembles an instrumental variable design in which the assignment variable is the instrument (Lee & Lemieux, 2010).

obtained without including covariates (Lee & Lemieux, 2010). Nevertheless, the current consensus is that covariates should be included in RD designs – especially if covariates are discontinuously distributed at the cut-off of the assignment variable – because they may reduce variance and eliminate bias in the average causal effect (Frölich & Huber, 2019).

We recommend scholars to estimate the average causal effect both with and without covariates. In a ‘strong’ RD design, the difference in the average causal effect in both settings should be minimal given the as-if random assignment. Yet, including covariates may provide insights into the robustness of the results and is especially recommended if the whole range of observations is included, i.e. even observations far away from the threshold (Imbens & Lemieux, 2008).

Second, leadership researchers need to select a bandwidth, i.e., a range of values around the threshold that should be included in the analysis. Selecting the bandwidth is a crucial decision, because the results are often sensitive to the bandwidth (Cattaneo et al., 2019; Imbens & Lemieux, 2008). Larger bandwidths have the advantage of reducing the variance in the coefficient of the discontinuity, because of the use of more observations, whereas smaller bandwidths reduce the likelihood of mis-specifying the local polynomial (Cattaneo et al., 2019).

Although in most empirical contexts there is no ‘objective’ bandwidth, there are, however, several statistical approaches for selecting an optimal bandwidth (e.g., Cattaneo & Vazquez-Bare, 2016; Imbens & Kalyanaraman, 2012). Whatever statistical approach or bandwidth selection criteria, we strongly recommend following Imbens and Lemieux (2008) and testing the sensitivity of findings in relation to different bandwidth choices (e.g., twice and half the size of the original bandwidth). This approach will reveal the level of robustness of the average causal effect and may increase the credibility of the findings (see, e.g., Arvate et al., 2018).

Thirdly, researchers debate the use of higher order polynomials of the assignment variable in RD designs. Some studies include high-order polynomials (e.g., fourth- or fifth-order polynomials) of the assignment variable in the regression to smoothen the regression function (Lee & Lemieux, 2010). However, Gelman and Imbens (2019) argue against this practice – unless there are strong theory-based reasons – because estimates become noisier and the results are sensitive to the choice of the high-order polynomials. Instead, they recommend using local low-order polynomials (linear or quadratic) in RD designs, which have a much lower variation in the estimates. We recommend the approach described by Lee and Lemieux (2010), who suggest analyzing the robustness of the average causal effect to changes in the inclusion of higher order polynomials both for a small and wide window around the threshold. Again, this approach provides further insights into the robustness of the findings and may increase the credibility of the RD design.

In addition to checking the robustness of the RD results for the three decisions, two types of placebo tests are also worth conducting. First, placebo cut-off tests check for a discontinuity at cut-off points where no treatment should have been assigned. Finding a discontinuity at a placebo cut-off may indicate confounding effects in the RD design. To test for the presence of multiple treatments, Imbens and Lemieux

(2008) found a good approach by splitting their sample into two subsamples: sub-sample 1 includes all observations on the left of the initial cut-off point (x^*); sub-sample 2 includes all observations on the right of x^* . In each sub-sample, scholars should use the median value of the assignment variable as the placebo cut-off, as this approach maximizes statistical power. The same regression function can be used to run the placebo test as shown in equation 6. In this case, however, tD , which represents the placebo treatment variable, ideally does not differ from zero in either of the sub-samples, which would indicate that no discontinuity is found at the placebo cut-off point.

Concluding remarks

Identifying causal relationships is becoming increasingly important for leadership scholars and experimental designs play a key role in this endeavor (Antonakis, 2017; Antonakis et al., 2010; Podsakoff & Podsakoff, 2019). The aim of this paper was to complement the recent experimental turn in leadership research by introducing natural experimental designs and discussing their potential for inferring causal relationships in leadership research.

Although this paper focuses on the potential of natural experiments and their implementation, it is also important to discuss some limitations (see also Harrison & List, 2004; Sekhon & Titiunik, 2012). First, a natural experiment is only as good as the plausibility of the as-if randomization. If the as-if randomization is plausible, we can assume that the internal validity of a natural experiment is almost as high as the internal validity of a laboratory or field experiment. However, if the as-if randomization is not plausible, then the internal validity of a natural experiment is rather low. Therefore, leadership scholars need to critically evaluate the quality of the as-if randomization — based on quantitative and qualitative evidence (Dunning, 2012).

Second, although natural experiments take place in a natural field setting, which guarantees their ecological validity, the external validity of natural experiments could be open to question. Often, the setting of a natural experiment is unique, or the interventions apply to a very specific group, which poses the question as to whether the findings can be generalized to other populations in other contexts (Dunning, 2012). To overcome this limitation, natural experiments can be combined with observational studies.

Finally, we need to emphasize that a ‘good’ natural experiment is no replacement for a ‘good’ research question. That is, leadership scholars need to consider that a natural experiment is just a tool to infer causal relationships; it is not an end in itself.

To sum up, the aim of this paper was to introduce the natural experimental design to leadership research. Although we have tried to cover important parts of the literature regarding natural experiments, we urge scholars interested in applying a natural experiment to additionally consult the literature on the specific design (i.e., standard natural experiment, IV design, RD design). We hope that this paper will stimulate the use of natural experiments in leadership research and will be a useful addition to the ‘experimental tool box’ of leadership scholars.

Appendix A. Retrieved set of studies

The set of exhibits included in this Appendix A provides some descriptive information on the reviewed articles. Specifically, Fig. 9 illustrates the distribution of the studies with respect to the disciplinary domain (as per the Scopus categories) and time. Table 8 details the source of the studies.

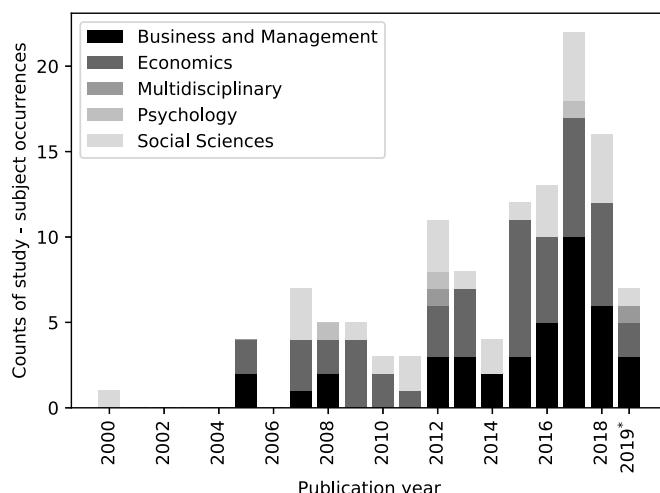


Fig. 9. Counts of retrieved studies — disciplinary subjects occurrences over time. Notes. Disciplinary subjects as per the Scopus database. * '2019' data concern the first quarter of the year only.

Table 8
Counts of retrieved studies by journal (alphabetical order).

Journal	Count of studies
Accounting Review	1
Accounting and Business Research	1
Accounting and Finance	1
Advances in Financial Economics	1
American Economic Journal: Applied Economics	4
American Economic Journal: Economic Policy	1
American Economic Review	1
American Journal of Political Science	4
American Journal of Sociology	1
American Political Science Review	3
Applied Economics	1
Applied Economics Letters	2
British Accounting Review	1
Comparative Political Studies	3
Corporate Governance: An International Review	1
Corporate Ownership and Control	1
Economica	2
Electoral Studies	3
European Journal of Economics, Finance and Administrative Science	1
Financial Management	2
Financial Review	1
Gender in Management	1
Human Resource Management	1
Industrial and Corporate Change	1
Industrial and Labor Relations Review	1
International Interactions	1
International Journal of Social Economics	1
International Studies Quarterly	1
Journal of Accounting and Economics	1
Journal of Banking and Finance	2
Journal of Business Ethics	2
Journal of Business Finance and Accounting	2
Journal of Business Research	2
Journal of Business Venturing	1
Journal of Comparative Economics	1
Journal of Corporate Finance	4
Journal of Economic Behavior and Organization	1
Journal of Empirical Finance	1
Journal of Finance	1
Journal of Financial Economics	2
Journal of Financial Research	1
Journal of Labor Economics	1
Journal of Management	1
Journal of Public Economics	2
Leadership Quarterly	2
Management Science	2
Political Psychology	1

(continued on next page)

Table 8 (continued)

Journal	Count of studies
Proceedings of the National Academy of Sciences	1
Public Administration	1
Public Administration Review	1
Public Choice	1
Quarterly Journal of Economics	2
Review of Economic Studies	1
Review of Financial Studies	1
School Effectiveness and School Improvement	1
Science	1
Small Business Economics	3
Social Science Quarterly	1

Appendix B. Topic modeling of abstracts

The natural language processing pipeline behind our topic model comprises several steps (see the Jupyter notebook attached to the submission as Supplemental material). In the first step, we use the Python library `spaCy` to pre-process the data. Specifically, we perform the following set of string manipulations:

- tokenization — sentences involved in the 1156 abstracts are segmented into words, numbers, punctuation;
- lemmatization — base form of a word are applied. For example, the lemma of ‘had’ is ‘have’;
- token removal — numbers and stop words (i.e., words that provide limited information about the meanings conveyed by a piece of text) are filtered-out.

In the second step, we leverage the Python library `Gensim` to create the input for the topic model, namely the *dictionary* (i.e., the set of unique tokens involved in the corpus of abstracts) and the *corpus* (i.e., a matrix containing the numeric transformation of each individual abstract in terms of the set of unique tokens included in the dictionary).

In the third step, we use `Mallet` software to estimate a set of competing topic models, each of which retains a unique number of topics (ranging from 10 to 29). We set the maximum number of topics equal to the number of categories included in [Gardner et al. \(2010\)](#). Considering the internal validity of the various models ([DiMaggio, Nag, & Blei, 2013](#)) and the coherence score – a statistical metrics that expresses the face validity of the inductively derived topics (see [Mimmo, Wallach, Talley, Leenders, & McCallum, 2011](#)) – we retain the model with ten topics. The pattern of topics associated with the best fitting model is shown in [Fig. 10](#). The left-hand side of the chart employs multidimensional scaling to offer a low-dimensional representation of the relationships among the eleven topics. The right-hand side of the visualization reports the set of the thirty most salient terms involved in the topic model. The live version of this visualization – available in html format as Supplemental materials – provides additional insights regarding the pairing structure linking terms and topics. For example, the set of the most salient terms changes as one moves the cursor over the bullets associated with the topics.

Finally, we use the topic model trained with Mallet to characterize each of the 87 studies included in the review along the various topics. This enables us to see how natural experiment methods map onto the space of leadership phenomena and theories (at least as represented in *The Leadership Quarterly*).

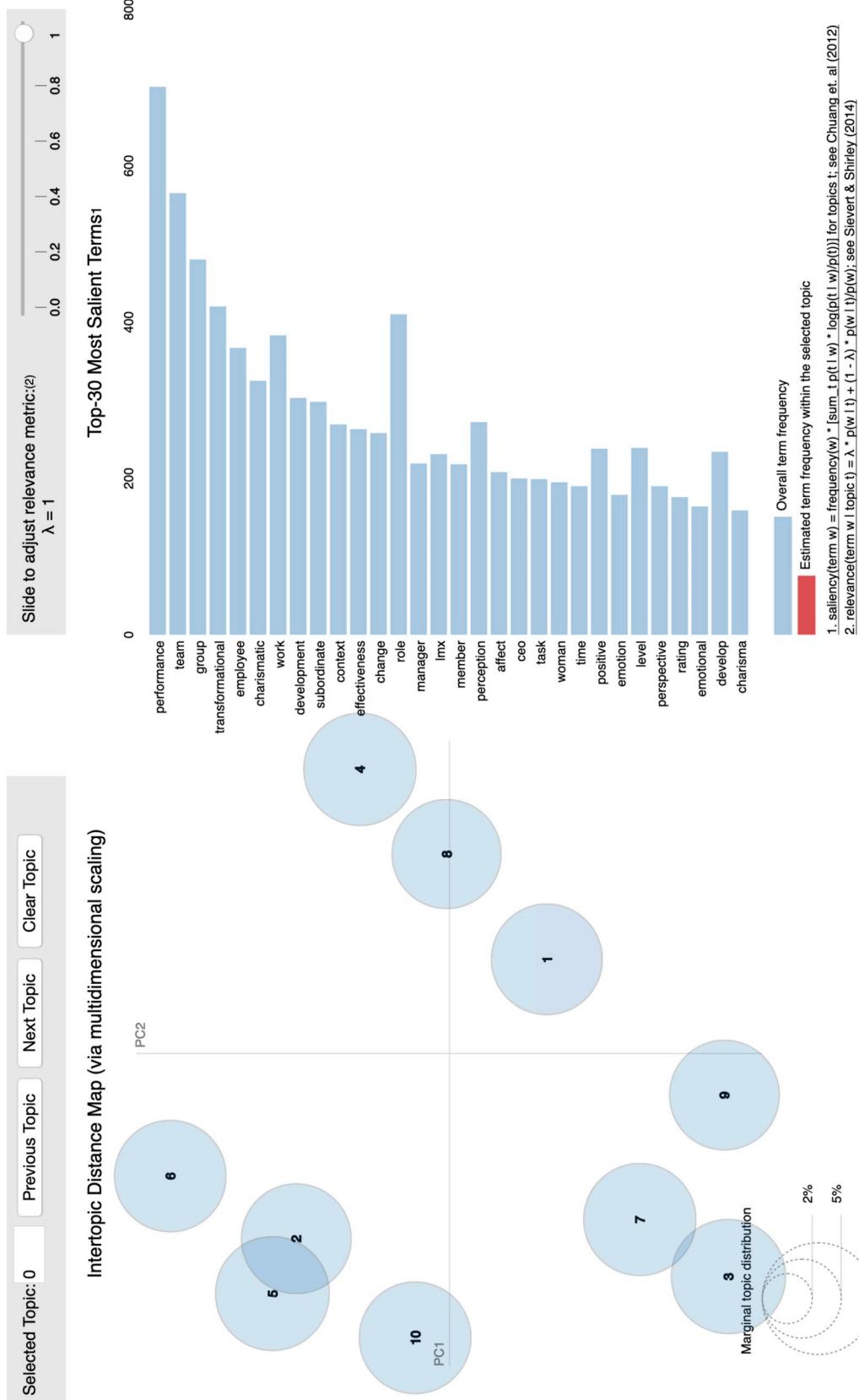


Fig. 10. Visualization of the topic modeling outcome.

Appendix C. Supplementary data and Python code

Supplementary data and Python code to this article can be found online at <https://doi.org/10.1016/j.lequa.2019.101338>.

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