# 60 Years of March and Simon's Organizations: An Empirical Examination of its Impact and Influence on Subsequent Research*

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ABSTRACT   We provide an analytic and systematic review of the impact of March and Simon's seminal *Organizations* on management research and discuss the book's value for current research and propose future applications of it. Building on bibliometric and text-mining approaches, our empirical analysis reveals that although *Organizations* was contextually based in the industrial milieu of the 1950s, its concepts have found ongoing resonance with scholars. Further, we find that much of this resonance appears to be driven by the ability of scholars in different 'schools of thought' to find useful insights from March and Simon's generalized theoretical structure. However, we also observe that scholars have been selective in their usage of ideas from the book over the last 60 years. Based our analysis, we propose a particular set of future research areas, including a focus on new organizational forms and extending March and Simon's ideas to multi-level research, which can benefit from more holistically drawing on *Organizations* and connect its original ideas to address current management problems.

**Keywords:** behavioral theory, bibliometrics, Carnegie School, Herbert Simon, innovation, James March, literature review, organizations, text mining

> A classic is a book which has never exhausted all it has to say to its readers.
>                                                  Italo Calvino, Why Read the Classics?

## INTRODUCTION

James March and Herbert Simon's (1958) *Organizations* (hereinafter *M&S*) is one of the most seminal publications in business and management, having been voted the seventh most influential management book of the 20th century (Bedeian and Wren, 2001). The initial publication, along with newer editions, has been cited more than 29,000 times (as of August 2019) according to Google Scholar. Together with Simon's (1947) *Administrative Behavior* and Cyert and March's (1963) *A Behavioral Theory of the Firm*, *M&S* laid the foundation of the Carnegie School (Gavetti et al., 2007). At the same time, similar to other work emerging from the Carnegie School, *M&S* has been criticized for its generality (Gavetti et al., 2007, 2012) and obvious propositions (Weick, 2017). However, despite *M&S*'s perceived and anecdotally discussed impact on subsequent management research, there is a lack of comprehensive and systematic reviews of its content and impact on business research. The various traditional narrative based reviews of *Administrative Behavior* and *A Behavioral Theory of the Firm* (Argote and Greve, 2007; Dosi and Marengo, 2007; Gavetti et al., 2007, 2012) focus largely at looking at the larger impact of the Carnegie School. The only direct review of *M&S* by Weick (2017) is predominantly a personal reflection.

Taking its significant impact on subsequent research into account, while accounting for criticisms as well, we aim to provide a broader, more detailed, and systematic analysis that better encompasses the wide scope of *M&S* and how it has inspired the research that followed its initial publication. In line with Makadok et al. (2018), we offer a critical perspective on the theoretical arguments advanced by *M&S* regarding: levels of analysis (the who?), phenomena (the where?), and boundary conditions (the when?). To do so, we structure our discussion in two parts, beginning with 'taking stock' of *M&S*, followed by our 'moving forward' discussion, in which we outline that *M&S* is still relevant for a significant array of applications in the study of organizations, and how future scholarship can be enhanced by building on *M&S*'s original ideas. In doing so, we attempt to take into account the context and time period in which *M&S* was written, and how its relevance and use by scholars changed as the business and management environment changed in the intervening 60 years.

From a methodological perspective, the diverse nature and wide impact of *M&S* make it difficult to provide an inclusive and transparent review (Denyer and Tranfield, 2009) using a traditional narrative review approach. Traditional narrative reviews are very flexible due to their less formalized method (Hammersley, 2001), but they tend to rely on a more limited number of studies (Rousseau et al., 2008) and are often criticized because of their potential bias and lack of both transparency and reproducibility (Denyer et al., 2008). Furthermore, there is often a bias associated with traditional literature reviews and expert surveys as they are conducted based on the (conscious and subconscious) assumptions and perspectives of the review team (Ramos-Rodriguez and Ruiz-Navarro, 2004). To borrow from *M&S*'s concept of bounded rationality, the sheer volume of relevant publications combined with the diversity of fields from which they originate (spanning management, strategy, psychology, sociology, and economics) exceeds the capabilities of the best review team. Due to the size and diversity of *M&S*'s impact, this limitation would be particularly salient for any traditional narrative review, as a review team would have to focus and limit its analysis to particular aspects. To address concerns of inclusivity and

transparency (Denyer and Tranfield, 2009), we combine two complementary empirical methods. We use bibliometric coupling with network analysis to identify research streams in the form of related publications based on the structure of their references. Further, we apply text mining, which allows us to identify central concepts and themes in each research stream and to map their evolution over the last 60 years. By using text mining, we shift the level of analysis from publications, and their citations, to the actual content of each publication.

Our review is structured as follows. First, we introduce *M&S* by summarizing the book using text mining to identify its conceptual and thematic underpinnings as they are revealed by the words and language used by *M&S*, without any presupposition as to concepts and theories therein. Second, we then focus our attention on the scholarship that has followed on from *M&S*, again without any preconception that might be biased by our imposing a structure on that work. To do so, we use bibliometric coupling analysis to isolate key research streams and their most representative publications followed on from *M&S*, aggregating them into clusters that represent coherent 'schools of thought'. Third, we examine these research streams with text mining to identify the key thematic underpinnings of each research stream, paying particular attention to their evolution. As such, our analytic approach did not focus on a set of key concepts we *a priori* identified as important but rather we derived concepts from the literature's subsequent use of the book. Fourth, we compare how these 60 years of research have built on the themes and concepts that we uncovered in the original manuscript. Finally, building on a discussion of how *M&S* has withstood the test of time, we provide suggestions for future research.

## METHODOLOGY

### Data

Our analysis is based on two main data sources: the book *M&S* itself and the journal publications that cite *M&S*. The core data in the first instance were the text of *M&S*; suitably converted into machine readable format, corrected for consistency and errors, and with the bibliography deleted. In the second step, we created a database of all journal publications that cite *M&S*. This was done by retrieving all publications (known as focal publications) citing the book from the ISI Web of Science (WoS) database in June 2017. We did not limit the search to specific journals or research areas (as frequently done in reviews) as we were interested in the overall impact of the book and its diverse nature. WoS is particularly suitable as it provides accurate and machine-readable bibliographic data on older publications via passive listing. Also, as common practice in most bibliometric reviews (e.g., Randhawa et al., 2016; Vogel and Güttel, 2012), we restricted our search to English-language articles only and excluded books and book chapters from our sample. This selection criteria led to an initial sample of 5168 articles citing *M&S*.

In the next step, we downloaded the abstracts for all citing articles. However, as WoS did not list abstracts for articles before 1988, we had to complement our WoS data with abstracts retrieved through Scopus. Overall, we obtained 99 per cent of abstracts for our analysis. Finally, to enable the bibliometric analysis and to provide a meaningful

analysis of the relatively long analysis period of 60 years, we followed previous empirical reviews (Ramos-Rodriguez and Ruiz-Navarro, 2004; Randhawa et al., 2016) to split the data in four equal 15-year time periods: 1958–72 (324 articles), 1973–87 (1226 articles), 1988–2002 (1417 articles), and 2003–17 (2201 articles).

## Coupling and Network Analysis

We use bibliographic coupling as a quantitative method to map and analyse scientific research, which has shown its usefulness in earlier management reviews (Devinney and Hohberger, 2017; Vogel and Güttel, 2012). Coupling provides a proximity score, which approximates the closeness between two publications by measuring the shared number of references between two documents (Kessler, 1963). We then used the proximity scores to create a network representation of the publications citing *M&S*. The network approach to analysing publications or references has become increasingly popular within bibliometric studies (e.g., Randhawa et al., 2016; Vogel and Güttel, 2012; Wilden et al., 2018). It possesses several advantages compared to classical clustering methods (e.g., clustering or multi-dimensional scaling), including allowing for the direct visualization of the relationships between publications (Randhawa et al., 2016), being more precise and effective (Zupic and Čater, 2015), and offering improved visual depictions for a larger numbers of publications (Vogel and Güttel, 2012).

We visualized the network with the Force Atlas algorithm implemented in the Gephi software (Jacomy et al., 2014). It estimates the position of a publication in the network by the proximity scores of the connections and the path length between publications. Next, we applied the Louvain modularity optimization to detect communities (clusters and streams of research) within the network (Blondel et al., 2008).[1] The number of resulting communities can be modified using a resolution coefficient (Lambiotte et al., 2015). We varied the resolution coefficients in an iterative fashion to optimize the quality of the cluster solutions (we only considered solutions with a modularity above 0.4) and to identify meaningful clusters. We also generated centrality measures for all publications. These are shown and explained in the Online Appendix.

## Text Mining

For the text mining part of our analysis we used the Bayesian learning algorithm implemented in Leximancer (Randhawa et al., 2016; Wilden et al., 2016). This approach allowed us to examine the words used by authors to conduct conceptual (thematic) and relational (semantic) analysis of the book and abstracts (Rooney, 2005). We investigated common text elements (concepts) and groupings of revealed text elements (themes). The algorithm automatically picks the best fitting number of themes contingent on the recognized concepts and permits overlapping of clusters of themes. This approach is especially suitable to our review. Previous research has found the results to be highly reproducible and the concept identifications and the clustering to be reliable, leading to a reduced risk of biases often inherent in manually coded text (Dann, 2010; Smith and Humphreys, 2006). Furthermore, this approach exhibits high face and correlative validity (see, e.g., Grech et al., 2002). We used the scanned and converted version of *M&S* and the respective abstracts of articles citing *M&S* as inputs into our analyses. We opted to merge word

variations (e.g., 'organization' and 'organizational') and used an integrated stop word list (e.g., 'is', 'just'). Subsequently, the algorithm generates concept seeds 'automatically using a ranking algorithm for finding seed words that reflect the themes present in the data. This process looks for words near the center of local maxima in the lexical co-occurrence network' (Smith, 2003, p. 23). The algorithm begins with a concept seed and widens the description to discover additional words (e.g., synonyms and modifiers), which carry comparable meaning. A weighting is then applied to the concept seeds, which is based on the frequency with which the seeds appear in sentences and is compared to how often the concept seeds appear in other parts of the abstracts. We used the standard learning threshold settings, opted to exclude name-like concepts (i.e., words starting with a capital letter) and limited the total number of concepts to be discovered to 60.

The outcome of this process step is the creation of an automatically generated dictionary containing relevant concepts. After close inspection of this list, we deleted concepts that did not carry significant meaning in our setting (e.g., 'respondent', 'publication'). Subsequently, using the text-derived dictionary, the data is marked with the identified concepts to a two-sentence resolution, and a concept is found to appear in a sentence block if sufficient amassed evidence (i.e., the sum of the weights of the keywords) is found. The results are represented as plots of the concepts in a semantic network via the application of an asymmetric scaling algorithm and the concept co-occurrence incidences are used to rank the concepts by their connectedness (map or meaning). Accordingly, both the frequency with which concepts occur, as well as the proximity with which they co-occur in the text, is investigated, resulting in 'entity concepts [being] clustered according to weight and relationship, to create a concept cluster map' (Grech et al., 2002, p. 1719). Themes in the maps are represented by circles, comprising multiple concepts, and their colour indicates the *importance* of the respective theme (i.e., the brighter, redder the circle, the more frequently the grouped concepts are mentioned in the data). The distance of the concepts and themes on the maps represents their degree of semantical relatedness (Campbell et al., 2011; Rooney, 2005). Lastly, we examined the maps of meaning and their statistical information and confirmed their stability by repeating the above procedure multiple times.

## THE ORIGINAL PUBLICATION OF *M&S*

In this section, we analyse the content of *M&S*, which will serve as the benchmark for the subsequent analysis of articles citing the book to identify its influence over the last 60 years. To do so, we do not use our own reading or interpretation but let the book itself 'speak' via machine-based text-mining identification of the core concepts and themes and their relationships.

Figure 1 shows the output for the entire book (excluding the preface and postscript). In the discussion of the text mining results throughout the remainder of this paper, words in italics refer to identified themes, and words in inverted commas represent identified concepts. We can see that *M&S* focused on the interaction between the *individual* (bright red) and the *organization* (red-brown colour), both representing the most central themes. The *organization* theme comprises the concepts 'behaviour', 'problem', and shares the concept
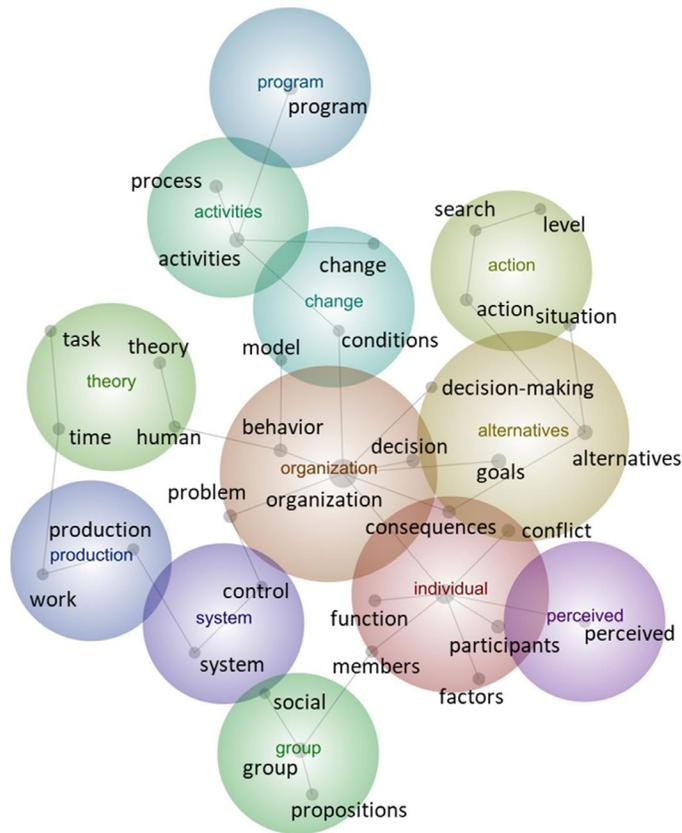
Figure 1. Concept and theme map based on text mining of March and Simon (1958) [Colour figure can be viewed at wileyonlinelibrary.com]

'decision' with the *individual* theme. The *individual* theme overlaps with the *alternative* theme with concepts such as 'consequences' and 'conflict', indicating a discussion about the outcomes of individual decision-making. Notably, individual perceptions (the theme *perceived*) appear to be important in this context. Furthermore, decision-making is an important area, as indicated by the theme decision *alternatives*, which comprises concepts such as 'decision-making', 'goals', and 'alternatives'. Some discussion also revolves around the *action* that results from decision-making. Relatively less attention was given to *group* dynamics (green colour) and *system* aspects of decision-making.

As *M&S* discuss distinct aspects of organizations in different parts of the book, we text-mined the book by chapters. Table I shows the breakdown of themes and concepts by chapter. We can see that Chapter 1 provides an overview of *organizations*, discussing their importance, and ends with the introduction of several propositions, which are further developed in the remainder of the book. The theme *organizations* comprises concepts such as 'behaviour', 'human' and 'influence'. They set out the reason for the book as 'psychology and sociology textbooks do not devote even a short chapter to the subject of formal organizations' (p. 2).

Table I. Themes and concepts by chapters

**Entire book**

| Theme | Con. | Concept | Count | Relev. |
|---|---|---|---|---|
| Individual | 100% | Individual | 386 | 45% |
| | | Participants | 162 | 19% |
| | | Conflict | 160 | 19% |
| | | Factors | 143 | 17% |
| | | Consequences | 126 | 15% |
| | | Function | 117 | 14% |
| | | Members | 106 | 12% |
| Organization | 98% | Organization | 855 | 100% |
| | | Problem | 169 | 20% |
| | | Behavior | 159 | 19% |
| | | Decision | 136 | 16% |
| Alternatives | 42% | Goals | 227 | 27% |
| | | Alternatives | 219 | 26% |
| | | Conflict | 160 | 19% |
| | | Consequences | 126 | 15% |
| | | Decision-making | 81 | 9% |
| Action | 35% | Situation | 136 | 16% |
| | | Level | 126 | 15% |
| | | Action | 120 | 14% |
| | | Search | 105 | 12% |
| Theory | 35% | Theory | 158 | 18% |
| | | Time | 143 | 17% |
| | | Task | 118 | 14% |
| | | Human | 90 | 11% |
| Group | 33% | Group | 268 | 31% |
| | | Propositions | 165 | 19% |
| | | Social | 62 | 7% |
| Activities | 29% | Activities | 236 | 28% |
| | | Process | 188 | 22% |
| Change | 22% | Change | 114 | 13% |
| | | Model | 92 | 11% |
| | | Conditions | 91 | 11% |
| Program | 16% | Program | 278 | 33% |
| Production | 16% | Production | 124 | 15% |
| | | Work | 117 | 14% |
| System | 13% | System | 106 | 12% |
| | | Control | 65 | 8% |
| | | Social | 62 | 7% |
| Perceived | 9% | Perceived | 110 | 13% |

**Chapter 1**

| Theme | Con. | Concept | Count | Relev. |
|---|---|---|---|---|
| Organizations | 100% | Organizations | 81 | 100% |
| | | Behavior | 24 | 30% |
| | | Human | 13 | 16% |
| | | Influence | 12 | 15% |
| | | Social | 10 | 12% |
| | | Environment | 10 | 12% |
| | | Significant | 8 | 10% |
| | | System | 7 | 9% |
| | | Formal | 7 | 9% |
| | | Psychologists | 4 | 5% |
| | | Society | 4 | 5% |
| | | Individual | 3 | 4% |
| Propositions | 13% | Propositions | 25 | 31% |
| | | Members | 4 | 5% |
| Time | 10% | Time | 15 | 19% |
| | | Memory | 8 | 10% |
| Specificity | 5% | Specificity | 7 | 9% |
| | | Degree | 6 | 7% |
| Evoked | 5% | Evoked | 10 | 12% |
| | | Process | 6 | 7% |
| Variable | 5% | Variable | 19 | 23% |
| Theory | 4% | Theory | 12 | 15% |
| Aspects | 3% | Aspects | 7 | 9% |
| Action | 2% | Action | 10 | 12% |

**Chapter 2**

| Theme | Con. | Concept | Count | Relev. |
|---|---|---|---|---|
| Organization | 100% | Organization | 63 | 95% |
| | | Tasks | 51 | 77% |
| | | Process | 26 | 39% |
| | | Purpose | 17 | 26% |
| Theory | 70% | Theory | 41 | 62% |
| | | Problem | 40 | 61% |
| | | Departmentalization | 21 | 32% |
| | | Formal | 17 | 26% |
| Activities | 62% | Activities | 66 | 100% |
| | | Group | 20 | 30% |
| | | Efficient | 17 | 26% |
| | | Fatigue | 12 | 18% |
| Time | 55% | Time | 53 | 80% |
| | | Work | 42 | 64% |
| | | Standard | 15 | 23% |
| Production | 51% | Human | 25 | 38% |
| | | Machine | 19 | 29% |
| | | Production | 17 | 26% |
| | | Methods | 9 | 14% |
| Propositions | 34% | Propositions | 20 | 30% |
| | | Form | 12 | 18% |
| | | Empirical | 12 | 18% |
| | | Coordination | 10 | 15% |
| Management | 18% | Behavior | 15 | 23% |
| | | Management | 14 | 21% |
| Worker | 4% | Worker | 15 | 23% |

**Chapter 3**

| Theme | Con. | Concept | Count | Relev. |
|---|---|---|---|---|
| Organization | 100% | Organization | 185 | 100% |
| | | Goals | 53 | 29% |
| | | Participation | 44 | 24% |
| Consequences | 85% | Consequences | 63 | 34% |
| | | Behavior | 49 | 26% |
| | | System | 48 | 26% |
| | | Model | 47 | 25% |
| | | Human | 16 | 9% |
| Individual | 85% | Individual | 132 | 71% |
| | | Work | 30 | 16% |
| | | Satisfaction | 23 | 12% |
| | | Needs | 21 | 11% |
| Group | 61% | Group | 155 | 84% |
| | | Factors | 54 | 29% |
| Relations | 57% | Relations | 58 | 31% |
| | | Productivity | 52 | 28% |
| | | Perceived | 39 | 21% |
| Identification | 37% | Identification | 69 | 37% |
| | | Norms | 29 | 16% |
| | | Task | 26 | 14% |
| Control | 35% | Control | 38 | 21% |
| | | Decisions | 32 | 17% |
| | | Hierarchy | 20 | 11% |
| Alternatives | 34% | Alternatives | 54 | 29% |
| | | Evoked | 43 | 23% |
| Members | 20% | Members | 47 | 25% |
| Time | 5% | Time | 16 | 9% |

Table I.   *Continued*

**Chapter 4**

| Theme | Con. | Concept | Count | Relev. |
|---|---|---|---|---|
| Perceived | 100% | Perceived | 50 | 34% |
|  |  | Alternatives | 50 | 34% |
|  |  | Movement | 44 | 30% |
|  |  | Factors | 36 | 25% |
|  |  | Search | 24 | 17% |
|  |  | Satisfaction | 19 | 13% |
| Organization | 82% | Organization | 145 | 100% |
|  |  | Participants | 86 | 59% |
|  |  | Behavior | 23 | 16% |
| Individual | 53% | Individual | 74 | 51% |
|  |  | Change | 33 | 23% |
|  |  | Groups | 30 | 21% |
| Inducements | 52% | Inducements | 50 | 34% |
|  |  | Utility | 34 | 23% |
|  |  | Balance | 21 | 14% |
|  |  | Inducements-contrib. | 13 | 9% |
| Job | 40% | Job | 52 | 36% |
|  |  | Satisfaction | 19 | 13% |
|  |  | Workers | 18 | 12% |
|  |  | Conditions | 17 | 12% |
| Employee | 17% | Employee | 53 | 37% |
| Level | 11% | Turnover | 32 | 22% |
|  |  | Level | 24 | 17% |
| Work | 5% | Work | 24 | 17% |
| Business | 3% | Business | 16 | 11% |

**Chapter 5**

| Theme | Con. | Concept | Count | Relev. |
|---|---|---|---|---|
| Organization | 100% | Organization | 140 | 100% |
|  |  | Conflict | 133 | 95% |
|  |  | Individual | 83 | 59% |
|  |  | Problems | 26 | 19% |
|  |  | Decision | 26 | 19% |
|  |  | Participants | 23 | 16% |
| Goals | 22% | Organization | 140 | 100% |
|  |  | Goals | 43 | 31% |
|  |  | Factors | 15 | 11% |
|  |  | Differentiation | 13 | 9% |
|  |  | Reward | 9 | 6% |
| Pressure | 16% | Pressure | 21 | 15% |
|  |  | Time | 14 | 10% |
|  |  | Behavior | 14 | 10% |
|  |  | Information | 10 | 7% |
| Alternatives | 15% | Alternatives | 55 | 39% |
|  |  | Search | 17 | 12% |
| Decision-making | 13% | Decision-making | 35 | 25% |
|  |  | Members | 12 | 9% |
| Bargaining | 9% | Bargaining | 31 | 22% |
|  |  | Game | 13 | 9% |
| Situation | 6% | Situation | 24 | 17% |
| Theory | 4% | Theory | 21 | 15% |

**Chapter 6**

| Theme | Con. | Concept | Count | Relev. |
|---|---|---|---|---|
| Organization | 100% | Organization | 139 | 94% |
|  |  | Individual | 36 | 24% |
|  |  | Tasks | 23 | 16% |
|  |  | Problem | 22 | 15% |
|  |  | Complex | 18 | 12% |
| Program | 75% | Program | 148 | 100% |
|  |  | Performance | 29 | 20% |
|  |  | Stimulus | 15 | 10% |
| Situation | 70% | Process | 56 | 38% |
|  |  | Situation | 52 | 35% |
|  |  | Definition | 22 | 15% |
|  |  | Problem-solving | 15 | 10% |
| Alternatives | 53% | Goals | 37 | 25% |
|  |  | Alternatives | 35 | 24% |
|  |  | Consequences | 25 | 17% |
|  |  | Uncertainty | 13 | 9% |
| Activities | 37% | Activities | 52 | 35% |
|  |  | Function | 20 | 14% |
| Action | 31% | Action | 39 | 26% |
|  |  | Decision | 25 | 17% |
| Rational | 30% | Rational | 45 | 30% |
|  |  | Choice | 21 | 14% |
| Behavior | 22% | Behavior | 26 | 18% |
|  |  | Structure | 19 | 13% |
| Communication | 17% | Communication | 54 | 36% |
| Coordination | 9% | Coordination | 22 | 15% |
| Information | 9% | Information | 24 | 16% |

**Chapter 7**

| Theme | Con. | Concept | Count | Relev. |
|---|---|---|---|---|
| Organization | 100% | Organization | 123 | 100% |
|  |  | Program | 109 | 89% |
|  |  | Innovation | 72 | 59% |
|  |  | Activity | 60 | 49% |
|  |  | Level | 52 | 42% |
|  |  | Change | 45 | 37% |
|  |  | Units | 32 | 26% |
|  |  | Criteria | 23 | 19% |
| Process | 41% | Process | 72 | 59% |
|  |  | Problem | 49 | 40% |
|  |  | Individual | 42 | 34% |
|  |  | Search | 27 | 22% |
|  |  | Time | 20 | 16% |
|  |  | Analysis | 18 | 15% |
| Action | 32% | Action | 42 | 34% |
|  |  | Structure | 27 | 22% |
|  |  | Theory | 26 | 21% |
|  |  | Attention | 24 | 20% |
|  |  | Choice | 18 | 15% |
| Price | 30% | Planning | 60 | 49% |
|  |  | Price | 48 | 39% |
|  |  | Mechanism | 34 | 28% |
|  |  | Conditions | 27 | 22% |
|  |  | Decision-making | 24 | 20% |
| Goals | 27% | Goals | 68 | 55% |
|  |  | Operational | 35 | 28% |
|  |  | Function | 19 | 15% |
| Decision | 22% | Planning | 60 | 49% |
|  |  | Decision | 33 | 27% |
|  |  | Conditions | 27 | 22% |
|  |  | Decision-making | 24 | 20% |
|  |  | Human | 17 | 14% |
| Group | 9% | Group | 37 | 30% |
|  |  | Problem-solving | 21 | 17% |

Connectivity (Con.): indicates the importance of the respective theme relative to the most central theme.
Relevance (Relev.): indicates the importance of the respective concept relative to the most central concept.

In Chapter 2, the discussion remains focused on *organizations*, this time deliberating relevant 'processes' and their purpose. There is also a detailed discussion on the history of organizational *theory*, focusing on Taylor's scientific management (as indicated by concepts such as 'human', 'production', 'fatigue' and 'worker') and, to a lesser extent, theories of departmentalization (as indicated by concepts such as 'departmentalization', 'formal' and 'theory').

Chapters 3 to 5 discuss how motivations and goals influence human behaviour in organizations, thereby adding to 'classical' organizational theory by viewing the employee as more than simply a passive instrument within the organization. In Chapter 3, the discussion focuses on the individual motivation to produce and, to some extent, covers how the environment influences organizations. Consequently, several existing models of *control* such as the Selznick and Merton models are introduced. Furthermore, the *individual* is discussed in more detail, including a discussion about satisfaction, as well as the theme *alternatives* comes up, preparing Chapter 4 'where the decision to participate in (or leave) the organization is discussed' (p. 53).

Chapter 4 concentrates on the individual participant's motivation to contribute to the organization. A detailed discussion is on inducements (as shown by the theme *inducements* and concepts such as 'inducements-contributions'), which are defined as '"payments" made by (or through) the organization to its participants (e.g., wages to a worker, service to a client, income to an investor)' (p. 84). Principal participants influence the equilibrium of the organization and are identified as: employees, investors, suppliers, distributors, and consumers. The emphasis here is on *employees*, with a discussion of the factors that lead to 'satisfaction' and *perceived* ease to move (i.e., 'movement' and 'turnover') and the availability of job *alternatives*.

Chapter 5 discusses 'conflict' in organizations, which are categorized into individual decision-making conflict, conflict within organizations, and interorganizational conflict. This chapter dominantly addresses organizational conflict (see also the bright red colour of the theme *organization* comprising the concept 'conflict'). Accordingly, we see themes such as *decision-making*, *goals*, and *bargaining* mattering more materially. *M&S* also gives a detailed discussion about the difference in *goals* as a contributor to intergroup conflict within an organization. The theme *pressure* appears in this chapter, discussing factors that give 'rise to a pressure toward participation in the relevant decisions made by other participants and thus to pressure toward joint decision-making' (p. 122). In terms of organizational reaction to conflict, four strategies are mentioned: problem-solving, persuasion, bargaining, and 'politics'. 'Game' theory is discussed in the context of *bargaining*.

In Chapter 6, *M&S* elaborates on *rational* decision-making as a limitation to existing organizational theory. Consequently, they discuss satisfactory vs. optimal standards when assessing *alternatives*. They discuss how different environmental *situations* (as perceived by organizational members) lead to different sets of organizational responses, which they term the performance *program*, which may be adaptive to a large number of stimuli. They give attention to the issue of *communication* and *coordination* and state that the 'capacity of an organization to maintain a complex, highly interdependent pattern of activity is limited in part by its capacity to handle the communication required for coordination' (p. 162). In this context, uncertainty absorption through communication is meant to

achieve coordination between units. This final part provides a brief discussion on organizational 'structure' and its impact on *behaviour*.

In the final Chapter 7, *Organization* looks at 'innovation' in organizations. *M&S* starts by differentiating between continuation of a program vs. 'change' in a 'program' of action. Change in program, that is, innovation, often creates costs that are difficult to estimate, leading to the tendency of individuals to prefer program continuity. They stress that a 'theory' of 'choice' of persistence vs. change needs to also discuss 'action' vs. inaction, and also consider the environmental 'conditions' in 'decision-making' (see theme *decision*). Then, attention is shifted towards the *process* of innovation, which is linked to 'problem-solving'. After discussing aspects of innovation (e.g., timing and institutionalization of innovation, non-programmed decision-making, *group* problem-solving), *M&S* moves on to consider the various organizational levels and their relationships to innovation. In this context, the authors refer back to *goals*. Finally, the *process* of 'planning' is discussed, referring back to the *price* mechanism to direct decisions.

## THE INFLUENCE AND IMPACT OF *M&S*

We now turn our attention to the research that has built on *M&S*. We start our analysis with a description of the research areas that have drawn on *M&S*. Table II categorizes the publications building on *M&S* across all scientific fields (Panel A), as well as within Business and Economics (Panel B).[2] Overall, the book has had a recognizable impact across a wide range of fields, but, not surprisingly, most research has been published in Business and Economics, followed by Psychology. While the relative number of publications citing *M&S* in Psychology has remained relatively constant (between 10 per cent and 12 per cent), its use in Business and Economics has become more dominant over time, increasing from 38 per cent of all publications in the period 1958–72 to 52 per cent in the period 2003–17. It is also important to note that the absolute number of publications has increased across most all scientific fields – with the notable exceptions of Sociology and Government and Law. However, *M&S* is a book whose appeal was, and remains, dominantly concentrated around Business, Management, Economics, and Psychology. A table highlighting the top 50 publication outlets can be found in the Online Appendix.

## FOCAL CONCEPTS AND THEMES IN WORK CITING *M&S*

Next, we show the results of the coupling and network analyses to identify citing clusters in publications building on *M&S*. We compare four equal-sized time periods to analyse the evolution of the relevant research. Figures 2a, 3a, 4a, and 5a depict the results of the coupling-based network analysis and Table III shows the most cited (i.e., most important publications in each cluster) and the most representative publications for each cluster based on their closeness centrality (a complete list of all publications within each cluster, including the associated network centrality statistics, can be found in the online Appendix). To keep the paper succinct, we show the labels for a number of particularly

Table II. Areas citing March and Simon (1958) by academic field and time period

| Area | Period 1–4:1958–2017 | | Period 1:1958–72 | | Period 2:1973–87 | | Period 3:1988–2002 | | Period 4:2003–17 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *n* | % | *n* | % | *n* | % | *n* | % | *n* | % |
| *Panel A: Across scientific fields* | | | | | | | | | | |
| Business & Economics | 3389 | 46% | 183 | 38% | 667 | 38% | 928 | 45% | 1611 | 52% |
| Psychology | 784 | 11% | 57 | 12% | 192 | 11% | 237 | 12% | 298 | 10% |
| Social Sci. | 394 | 5% | 38 | 8% | 143 | 8% | 101 | 5% | 112 | 4% |
| Public Administration | 367 | 5% | 14 | 3% | 96 | 5% | 93 | 5% | 164 | 5% |
| Sociology | 319 | 4% | 48 | 10% | 110 | 6% | 97 | 5% | 64 | 2% |
| Government & Law | 266 | 4% | 24 | 5% | 113 | 6% | 61 | 3% | 68 | 2% |
| Computer Sci. | 248 | 3% | 5 | 1% | 44 | 3% | 69 | 3% | 130 | 4% |
| Operations & Mgmt. Sci. | 246 | 3% | 14 | 3% | 50 | 3% | 81 | 4% | 101 | 3% |
| Engineering | 219 | 3% | 8 | 2% | 38 | 2% | 73 | 4% | 100 | 3% |
| Inform. & Library Sci. | 184 | 2% | 8 | 2% | 19 | 1% | 38 | 2% | 119 | 4% |
| Education | 182 | 2% | 21 | 4% | | | 52 | 3% | 48 | 2% |
| International Relations | 59 | 1% | 9 | 2% | 29 | 2% | | | | |
| Urban Studies | | | 6 | 1% | 61 | 3% | | | | |
| *Panel B: Within business & economics* | | | | | | | | | | |
| Gen. Mgmt. & Strategy | 1174 | 35% | 76 | 42% | 276 | 41% | 326 | 35% | 496 | 31% |
| Org. Behaviour & HRM | 843 | 25% | 33 | 18% | 150 | 22% | 257 | 28% | 403 | 25% |
| Economics | 262 | 8% | 23 | 13% | 44 | 7% | 73 | 8% | 122 | 8% |
| Mgmt. Sci. & Operations | 234 | 7% | 13 | 7% | 51 | 8% | 65 | 7% | 105 | 7% |
| Marketing | 155 | 5% | 8 | 4% | 37 | 6% | 38 | 4% | 72 | 4% |
| Other | 128 | 4% | 11 | 6% | 24 | 4% | 17 | 2% | 76 | 5% |
| Innovation | 123 | 4% | | | 10 | 1% | 41 | 4% | 72 | 4% |
| Psychology | 109 | 3% | 8 | 4% | 21 | 3% | 32 | 3% | 48 | 3% |
| Int. Business | 102 | 3% | 3 | 2% | 15 | 2% | 15 | 2% | 69 | 4% |
| MIS, KM | 89 | 3% | | | 6 | 1% | 21 | 2% | 62 | 4% |
| Finance & Accounting | 78 | 2% | 8 | 4% | 27 | 4% | 21 | 2% | 22 | 1% |
| Entrepreneurship | 65 | 2% | | | | | 16 | 2% | 49 | 3% |

*Note:* Only areas >1% are included in this table.

relevant publications in the network graphs and only the Top 3 publications in Table III. Based on the coupling results, we use text mining to investigate whether the research using *M&S*'s concepts and themes differed across time periods and across respective clusters of research. To do so, we use the cluster membership of each article as identified in the previous analyses and conduct thematic analysis per period (Figures 2b, 3b, 4b and 5b). Clusters are identified by $\#_t$, where # indicates the cluster and $t$ the time period: 1 = 1958–72, 2 = 1973–87, 3 = 1988–2002, and 4 = 2003–17.
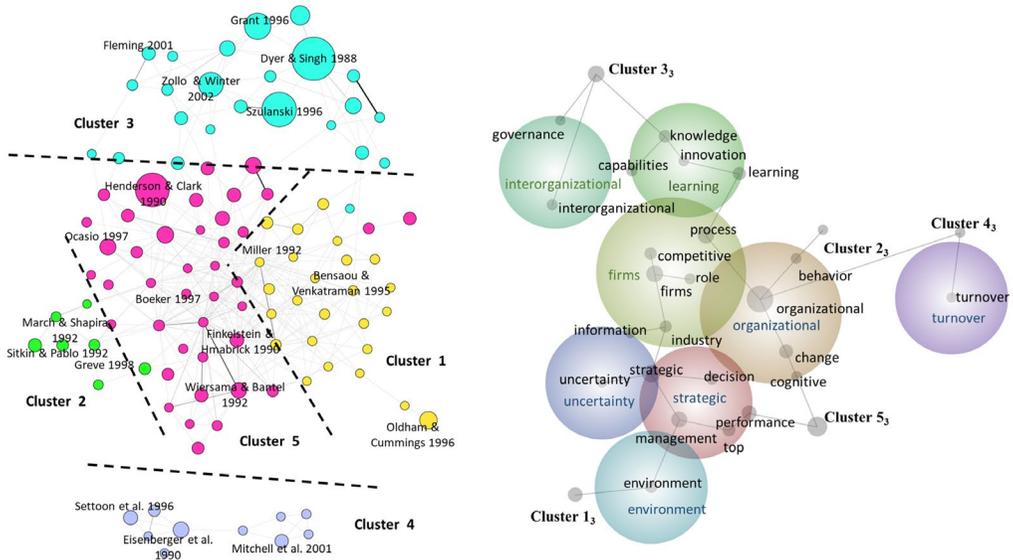
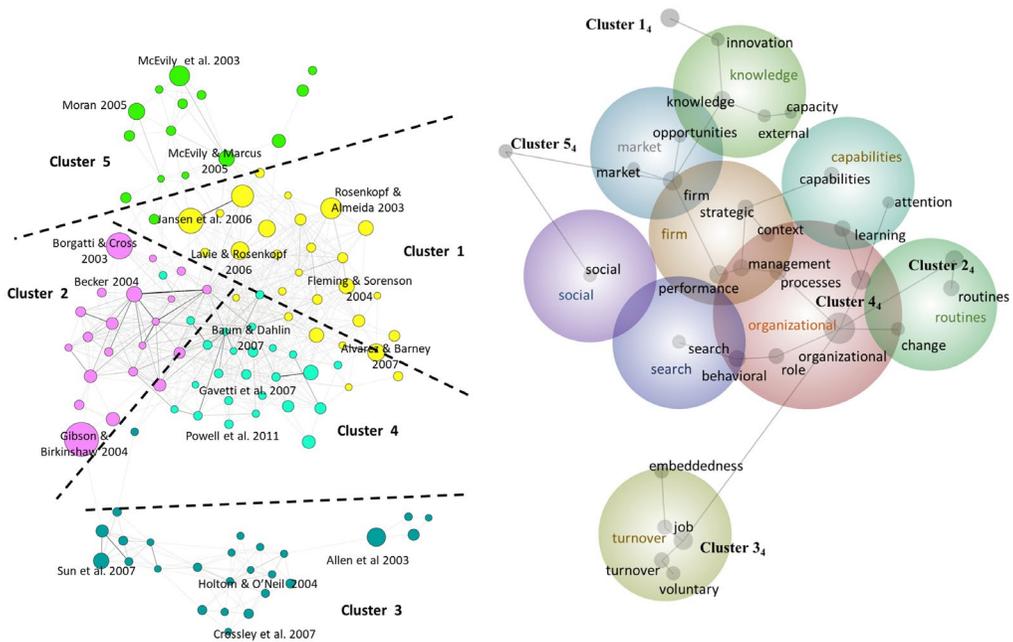Figure 2. (a and b) Coupling and text mining period 1958–72 [Colour figure can be viewed at wileyonlinelibrary. com]



Figure 3. (a and b) Coupling and text mining period 1973–87 [Colour figure can be viewed at wileyonlinelibrary. com]

In the first time period, 1958–72, the coupling analysis identified 7 clusters. However, given the small number of publications in two of these clusters (n < 3), we only analysed the text of five clusters. Cluster $1_1$ is closely related to research on 'individual' career development and how individuals identify their *role* in commitment to the organization (e.g., Hall et al., 1970; Hrebiniak and Alutto, 1972), whereas the work of Katzell and colleagues

Figure 4. (a and b) Coupling and text mining period 1988–2002 [Colour figure can be viewed at wileyonlinelibrary.com]



Figure 5. (a and b) Coupling and text mining period 2003–17 [Colour figure can be viewed at wileyonlinelibrary.com]

(1961) (Cluster $5_1$) discusses *job* satisfaction and employee turnover. Cluster $4_1$ discusses topics of *conflict* (Pondy, 1967; Schmidt and Kochan, 1972; Walton and Dutton, 1969) and the contingency strategy approach to organizational theory (Hickson et al., 1971),

Table III. Clusters and central publications by time period

| Period 1:1958–72 | | | | | Period 2:1972–87 | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cl. | Cit. | Publication | Centr. | Publication | Cl. | Cit. | Publication | Centr. | Publication |
| 0 | 324 | Hrebiniak and Alutto (1972) | 0.83 | Hrebiniak and Alutto (1972) | 0 | 2476 | Daft and Lengel (1986) | 0.84 | Hart (1992) |
| 0 | 198 | Hall et al. (1970) | 0.71 | Hall (1971) | 0 | 1575 | Daft and Weick (1984) | 0.84 | Daft and Macintosh (1981) |
| 0 | 150 | Hall (1971) | 0.71 | Hall et al. (1970) | 0 | 613 | Milliken (1987) | 0.80 | Daft and Lengel (1986) |
| 2 | 818 | Simon (1959) | 1.00 | Simon (1959) | 1 | 9219 | Dimaggio and Powell (1983) | 0.86 | Miller (1987) |
| 2 | 13 | Isard and Dacey (1962) | 0.75 | Shubik (1961) | 1 | 2651 | Hambrick and Mason (1984) | 0.73 | Fredrickson (1986) |
| 2 | 13 | Dahl (1959) | 0.75 | Isard and Dacey (1962) | 1 | 1148 | Dess and Beard (1984) | 0.73 | Hambrick and Finkelstein (1987) |
| 3 | 1024 | Perrow (1967) | 0.56 | Perrow (1967) | 2 | 6090 | Meyer and Rowan (1977) | 0.81 | Cook (1977) |
| 3 | 313 | Collins (1971) | 0.50 | Hage and Aiken (1969) | 2 | 332 | Ouchi (1977) | 0.65 | Comstock and Scott (1977) |
| 3 | 270 | Hage and Aiken (1969) | 0.41 | Pugh et al. (1963) | 2 | 327 | Cook (1977) | 0.65 | Hrebiniak (1974) |
| 4 | 617 | Hickson et al. (1971) | 0.89 | Hickson et al. (1971) | 3 | 2158 | Mowday et al. (1979) | 0.76 | Steel and Ovalle (1984) |
| 4 | 385 | Pondy (1967) | 0.67 | Walton and Dutton (1969) | 3 | 1831 | Eisenberger et al. (1986) | 0.76 | Farrell and Rusbult (1981) |
| 4 | 117 | Walton and Dutton (1969) | 0.67 | Pondy (1967) | 3 | 807 | Mobley et al. (1979) | 0.72 | Mobley et al. (1979) |
| 6 | 85 | Katzell et al. (1961) | 0.75 | Parker (1963) | 4 | 1438 | Williamson (1981) | 0.52 | Kiesler and Sproull (1982) |

Table III.   (Continued)

**Period 1: 1958–72**

| Cl. | Cit. | Publication | Centr. | Publication |
|---|---|---|---|---|
| 6 | 46 | Indik (1963) | 0.75 | Katzell (1962) |
| 6 | 26 | Parker (1963) | 0.50 | Indik (1963) |

**Period 2: 1972–87**

| Cl. | Cit. | Publication | Centr. | Publication |
|---|---|---|---|---|
| 4 | 954 | March and Olsen (1983) | 0.51 | Schoemaker (1982) |
| 4 | 896 | March and Shapira (1987) | 0.47 | Williamson (1981) |

**Period 3: 1988–2002**

| Cl. | Cit. | Publication | Centr. | Publication |
|---|---|---|---|---|
| 0 | 915 | Oldham and Cummings (1996) | 0.77 | Miller (1992) |
| 0 | 409 | Eisenhardt and Zbaracki (1992) | 0.63 | Bensaou and Venkatraman (1995) |
| 0 | 333 | Dean and Bowen (1994) | 0.63 | Smith et al. (1991) |
| 1 | 530 | Sitkin and Pablo (1992) | 0.75 | Greve (1998) |
| 1 | 419 | Haunschild and Miner (1997) | 0.67 | March and Shapira (1992) |
| 1 | 404 | Bromiley (1991) | 0.67 | Bromiley (1991) |
| 2 | 3243 | Dyer and Singh (1998) | 0.58 | Rosenkopf and Nerkar (2001) |
| 2 | 2460 | Szulanski (1996) | 0.53 | Zollo and Winter (2002) |

**Period 4: 2003–17**

| Cl. | Cit. | Publication | Centr. | Publication |
|---|---|---|---|---|
| 0 | 551 | Jansen et al. (2006) | 0.73 | Agarwal et al. (2007) |
| 0 | 472 | Jansen et al. (2005) | 0.71 | Phene et al. (2006) |
| 0 | 440 | Rosenkopf and Almeida (2003) | 0.69 | Afuah and Tucci (2012) |
| 1 | 792 | Gibson and Birkinshaw (2004) | 0.87 | Becker (2004) |
| 1 | 582 | Borgatti and Cross (2003) | 0.87 | Lewin et al. (2011) |
| 1 | 291 | Becker (2004) | 0.83 | Parmigiani and Howard-Grenville (2011) |
| 2 | 374 | Allen et al. (2003) | 0.60 | Griffeth et al. (2005) |
| 2 | 294 | Sun et al. (2007) | 0.57 | Lee et al. (2008) |

Table III. (Continued)

| Period 3:1988–2002 | | | | | Period 4:2003–2017 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Cl. | Cit. | Publication | Centr. | Publication | Cl. | Cit. | Publication | Centr. | Publication |
| 2 | 1719 | Grant (1996) | 0.52 | Dyer and Singh (1998) | 2 | 211 | Takeuchi et al. (2007) | 0.53 | Trevor and Nyberg (2008) |
| 3 | 751 | Eisenberger et al. (1990) | 0.60 | Jaros et al. (1993) | 3 | 271 | Gilbert (2005) | 0.86 | Gavetti et al. (2012) |
| 3 | 620 | Settoon et al. (1996) | 0.60 | Eisenberger et al. (1990) | 3 | 229 | Ethiraj and Levinthal (2004) | 0.80 | Gavetti (2012) |
| 3 | 548 | Mitchell et al. (2001) | 0.50 | Mitchell et al. (2001)/ Chen et al. (1998) | 3 | 187 | Gavetti et al. (2005) | 0.77 | Gavetti et al. (2007) |
| 4 | 2392 | Henderson and Clark (1990) | 0.66 | Miller (1993) | 4 | 418 | Mcevily et al. (2003) | 0.64 | Mcevily and Marcus (2005) |
| 4 | 856 | Walsh and Ungson (1991) | 0.66 | Lant et al. (1992) | 4 | 318 | Moran (2005) | 0.61 | Villena et al. (2011) |
| 4 | 799 | Van de Ven and Poole (1995) | 0.63 | Boeker (1997) | 4 | 298 | Mcevily and Marcus (2005) | 0.58 | Lee (2007) |

as indicated by the concept 'contextual'. Finally, Cluster $3_1$ is dominated by the work of Perrow (1967), with its well cited comparative analysis of organizations, and Hage and Aiken's (1969) early discussion of routines and their link to organizational 'structures' and goal setting.

In the second time period, 1973–87, we can see that the publications in Cluster $1_2$ relate to communication and R&D in an innovation setting. This includes discussions on organizational *structure* and influential work on boundary spanning (Tushman, 1977), but also more general work on *information* processing, which is closely connected to the centre of the network (e.g., Daft and Lengel, 1986; Daft and Weick, 1984). Additionally, in the text mining results, we see that this research also emphasizes the role and the characteristics of individuals. Cluster $2_2$ comprises publications that focused on process-oriented organization theory (e.g., Burgelman, 1983; Fredrickson, 1984; Ireland et al., 1987), work that revolves around topics such as *organizational structure* (e.g., Miller, 1987) and 'decision'-making (e.g., Huber and McDaniel, 1986; Shrivastava and Grant, 1985) in the context of organizational 'change' and evolution. It is also noteworthy that seminal work on institutional theory (DiMaggio and Powell, 1983) and upper echelon theory (Hambrick and Mason, 1984) are located in this cluster. What is interesting to note is that while these papers have been influential – i.e., well cited – they are less representative of the overall cluster – they possess low centrality. Similarly, in Cluster $3_2$, the most cited article is Meyer and Rowan (1977), which discusses organizational structures as myths and ceremony, but it is not actually representative of this very diverse cluster. Cluster $4_2$ is similar to Cluster $5_1$, with its concentration of research on 'employees' role in the organization, including *job* 'satisfaction' and 'turnover' (e.g., Mowday et al., 1979; Steel and Ovalle, 1984) and 'commitment' (e.g., Angle and Perry, 1981; Bateman and Strasser, 1984; Eisenberger et al., 1986); themes which also clearly appear in the text mining analysis. While Cluster $5_2$ is relatively diverse, and importantly includes work on transaction cost economics (e.g., Williamson, 1981) and 'decision' 'process' (e.g., Simon, 1979), it is largely centred around 'behavior', most obviously culminating in the behavioural theory of the firm. This group includes work on managerial risk taking (March and Shapira, 1987), organizational 'change' (March, 1981), control (Lord and Kernan, 1987), and rational 'decision' making (Simon, 1979). Overall, it should be noted that Clusters $1_2$, $2_2$ and $5_2$ are connected, with significant conceptual overlaps. On the other hand, Cluster $4_2$ is clearly separated and quite distinct from the other research utilizing *M&S*. This is mirrored by the text mining results, where cluster $4_2$ with its focus on 'turnover', 'commitment', and 'satisfaction', is distant from the remaining network and the concepts 'organizational', 'information', 'performance', and 'decision' are most central.

In the third time period, 1988–2002, publications in Cluster $1_3$ largely centre on issues around 'environmental fit' and contingency approaches in the context of competitive *strategy* (Miller, 1992, 1993), configurations of inter-organizational relationships (Bensaou and Venkatraman, 1995), environmental munificence (Castrogiovanni, 1991), and strategic fit at the business unit level (Govindarajan, 1988). Cluster $1_3$ represents an *organizational* 'behavior' cluster with a relatively strong focus on 'risk'-taking, including Greve's (1998) work on aspiration and risk, March and Shapira's (1987) research on risk preferences and attention, Sitkin and Pablo's (1992) publication on the determinants of risk taking, and Bromiley's (1991) study on the relationship between risk taking and corporate

performance. We see also that Cluster $2_3$ is closely related to Cluster $5_3$, which includes research on 'top' 'managements' team 'decision', such as upper echelon research and demographics (Finkelstein and Hambrick, 1990; Wiersema and Bantel, 1992), extending the work by Hambrick and Mason (1984) that appeared in time period 2. This cluster also includes research on search, innovation and 'change' (Gavetti and Levinthal, 2000; Henderson and Clark, 1990; Van de Ven and Poole, 1995). The text mining analysis also shows the close colocation of Clusters $1_3$ and $4_3$, with the associated concepts of 'top', 'management', 'decision', 'cognitive', 'change', and 'behavior'. Cluster $5_3$ is connected to Cluster $3_3$, where we see 'innovation', *learning*, 'search', and respective 'capabilities' forming the core concepts and themes. This cluster includes research on search and non-local search (Fleming, 2001; Fleming and Sorenson, 2001; Rosenkopf and Nerkar, 2001) and *learning* specific capabilities and dynamic capabilities (Zollo and Winter, 2002) – often in the context of *interorganizational* relationships (Dyer and Singh, 1998; Zollo and Winter, 2002) – and studies on the challenges of *knowledge* transfer (Szulanski, 1996). At the centre of this cluster is research on evolution and change; for example, on the topics of renewal (Barr et al., 1992; Boeker, 1997; Huff et al., 1992), reorientation (Lant et al., 1992), and transformation (Miner et al., 1990). In the text mining graph, Clusters $5_3$ and $3_3$ are less connected. However, the text mining results of Cluster $3_3$ are very representative of the associated articles ('knowledge', 'interorganizational', 'innovation', 'capabilities' and 'governance'). Finally, Cluster $4_3$ represents the continuation of scholarship on job *turnover* and commitment (Einsenberger et al., 1997; Mitchell et al., 2001; Settoon et al., 1996). Overall, it is worth noting that based on the text mining results, 'strategic' concepts became more dominant during the period 1988–2002.

In the most recent time period, 2003–17, the coupling analysis identifies five clusters. In Cluster $1_4$, we find publications that relate to innovation, knowledge, and search, as evidenced not only by the Top 3 articles but also in the other relevant work (Fleming and Sorenson, 2004; Nerkar, 2003; Rosenkopf and Almeida, 2003). We can see that Cluster $1_4$ is closely linked to the concepts 'innovation', 'knowledge' and 'external' 'capacity', indicating that the papers in this cluster discuss the themes of *market* opportunities and *knowledge*. Publications in Cluster $2_4$ focus on routines and change (Becker, 2004), absorptive capacity routines (Lewin et al., 2011), and routines (Parmigiani and Howard-Grenville, 2011). Accordingly, the text mining results show the key theme as *routines*, together with the concept 'change'. Cluster $2_4$ is closely related to Cluster $4_4$, which comprises publications related to the Neo-Carnegie School (Gavetti et al., 2007; Powell et al., 2011), as well as research on inertia (Gilbert, 2006), aspiration (Baum and Dahlin, 2007), and slack (Daniel et al., 2004). Cluster $4_4$ is also related to the *capabilities*, *routines*, and *organizational* themes, which share the 'learning' and 'change' concepts. The *organizational* theme further comprises the concepts 'behavioral', 'process', 'management', and 'performance', the latter ones sharing with the *firm* theme. Cluster $3_4$ represents a general human resource management cluster (Allen et al., 2003; Felps et al., 2009; Holtom and O'Neill, 2004) and has again a strong emphasis on turnover and motivation related publications. This is also reflected in the cluster's location within the *job* theme, which comprises the concepts 'voluntary', 'turnover', and 'embeddedness'. Finally, Cluster $5_4$ is closely linked to the *firms* and *search* themes (McEvily and Marcus, 2005; McEvily et al., 2003; Moran, 2005) and *social* capital (De Carolis and Saparito, 2006; Villena et al., 2011).

## DISCUSSION: HOW RELEVANT IS *M&S* TODAY?

We structure our discussion in two parts. First, we 'take stock' of our findings and highlight some areas where scholars have made limited use of *M&S*. We then 'move forward' by providing suggestions about how ideas from *M&S* could contribute to future research in areas such as organizational structure and control; individuals; and change and innovation. Thus, our discussion is grounded in and extends the preceding empirical analysis.

### Taking Stock

*M&S* not only has a continuing and sustaining influence but even a growing influence, receiving four times more citations over the period 2003–17 than over the period 1958–72. A reason for this appeal is that the book combines diverse and fundamental conceptual insights within management, including human motivations, decision-making, and organizational imperatives – all topics that have been at the core of business and management scholarship, with varying degrees of emphasis, over the last six decades. *M&S* has the ability to speak to scholars from many disciplines in management – from organizational theory and behaviour, strategy, and supply chain management – as well as other social sciences, particularly psychologists and economists. In addition, the work has spoken to different generations of scholars, albeit in different forms as topical areas waxed, waned, and were reborn. It is, therefore, no surprise that we find the book's widespread influence on several research fields in our coupling analysis (as seen in Figures 2a, 3a, 4a, and 5a). Our findings are in line with Weick (2017, p. 1), who states that '[t]he context in which "Organizations" first appeared was one of diffuse social science that was being consolidated and gaining momentum'. At a time when scholarly journals were not well developed yet, the book synthesized many ideas about organizations.

To add precision to these observations, we conducted analysis of the complete text of *M&S*, which shows that around the core theme of *M&S* we see three groupings of ideas. The first concentrates on the themes of *group*, *system*, and *production*. The second is related to the themes of *action*, *alternative* and *individual*. The third is associated with the themes of *change*, *activity* and *program*. It is interesting how the subsequent literature has only peripherally picked up on these distinctions, as nearly all of the coupling clusters link back to a limited number of narrow themes and concepts. Examining Figures 2b, 3b, 4b, and 5b, we see that only four of the clusters – $1_1$, $5_3$, $0_4$, and $5_4$ – meaningfully link to more than one thematic area. This is reflective of scholars using *M&S* to build on relatively narrow areas of research; having then selected specific concepts from *M&S* to provide weight to their theorizing and justification. While some scholars used *M&S* in its totality, it has been more likely that scholars chose those parts of *M&S* that assisted them in their existing or emerging area of work. One proposition that follows from this is that, perhaps, *M&S* has served primarily as an evolutionary impetus that helped scholars do what they were going to do anyway, but do it better, faster, and more parsimoniously.

Matching the book's content with how citing publications have used these ideas over time, our analysis shows that while some concepts and themes emerging from *M&S* have increased in attention over time, others have become less important, lending support to the view that *M&S* were not just describing a current context but where sufficiently robust in their conceptualization to incorporate potentially new and evolving ideas that

they anticipated might be important in the future. The first period (1958–72) following the publication of $M\&S$ saw work relating to industrial jobs (Cluster $5_1$), technology and industry structure (Cluster $3_1$), subunits of organizations and conflict (Cluster $4_1$) and much more general work on the role of the individual as more than just a tool of the organization (Cluster $1_1$). By the final time period (2003–17), we see a very different pattern. Clusters $2_4$ and $4_4$ reflect related work on routines, with the former addressing routines and change and the latter routines, learning and organizational structure. Cluster $1_4$ and $5_4$ relate to knowledge, with the latter linking social search to firms, while the former concentrates on scholarship linking knowledge to innovation and opportunities. The intermediate time periods (1973–87 and 1988–2002) are interesting in that they reveal how $M\&S$ was used to support and buttress research relating to strategy, structure, effectiveness, performance, and fit (Clusters $3_2$ and $5_2$ in the second period and cluster $1_3$ in the third period), the rising importance of cognition and its relationship to change (Clusters $2_3$ and $5_3$), and the emerging work on top management teams (Cluster $2_2$) and later that on governance (Cluster $3_3$). As highlighted by the coupling and text-mining analyses, the only real area of work that consistently utilized $M\&S$ over the 60-year period was that relating to employment and jobs. This analysis further highlights how subsequent research has built on and borrowed ideas from $M\&S$ even though their key ideas were not part of $M\&S$. For example, the terms routine and capabilities did not appear as central themes or concepts in $M\&S$ in our analysis; however, research within the capability view of the firm are relevant in Cluster $4_4$. On the other hand, some themes and concepts central to the book became less relevant to the later discussion. For example, the theme/concept of conflict, while central to the book and Period 1, does not appear in the later periods in our analysis.

Interestingly, our analysis of the forward citations led to the impression that research on global, service-oriented, internet-enabled, social media driven features of business activities, with its reliance on looser organizational forms and more individual-by-individual labour structures (e.g., Cirillo et al., 2018), has tended to not pick up on $M\&S$. In addition, new technologies have changed the way individuals and organizations interact and contract with each other and given rise to greater economic representation of entrepreneurial firms supported by private equity and venture capital structures. To further investigate this observation, we collected various publication samples related to new organizational forms and compared the citation ratio of $M\&S$ in theses samples to the citation rate in two control samples. We used five samples to approximate the very diverse research around new organizational forms: 1) business model innovation, 2) ecosystems, 3) platforms, 4) blockchain, and 5) industry 4.0. While none of these samples individually can provide a complete picture on the use of $M\&S$ within recent research on new organizational forms, the combination of the different samples provides an overall indication of its use related to new organizational forms. To control for the citation rates, we generated samples in research on 'industrial organization' and in 'general management'. In each case, we focused on publications within management and business journals and the most cited publications (max. 2000 publications). The results shown in Table IV clearly indicate that $M\&S$ is far less cited in the area of new organizational forms than in our general management sample. The fractional citation rates ($M\&S$ citation rate per overall references) for the new organizational forms ranges from 0.000 per cent to a maximum

Table IV. Citation statistics for M&S in selected research areas

| Sample | New organizational forms | | | | | Control sample | |
|---|---|---|---|---|---|---|---|
| Topic | Business model innovation | Ecosystems | Platforms | Block-chain | Industry 4.0 | Industrial organization | General management |
| Journal base | Business & management | Business & management | Business & management | Business & management | Business & management | Business & management | Business & management |
| Time restriction | None | None | None | None | None | None | Last 10 years |
| Journal restriction | None | None | None | None | None | None | High reputation journals[a] |
| N. of publications | 475 | 2000[b] | 2000[b] | 180 | 234 | 1089 | 2000[b] |
| N. of references | 26,234 | 108,656 | 102,656 | 6096 | 9028 | 42,119 | 191,079 |
| M&S references | 2 | 8 | 15 | 0 | 0 | 9 | 138 |
| M&S cit. /articles | 0.421% | 0.400% | 0.750% | 0.000% | 0.000% | 0.826% | 6.900% |
| M&S cit. / references | 0.008% | 0.007% | 0.015% | 0.000% | 0.000% | 0.021% | 0.072% |
| 3 most cited references | Teece (2010), Zott et al. (2011), Chesbrough (2010) | Iansiti and Levien (2004), Adner and Kapoor (2010), Moore (1996) | Chesbrough (2003), Barney (1991), Kaplan and Heanlein (2010) | Nakamoto (2008), Swan (2015), Tapscott and Tapscott (2016) | Brettel et al. (2014), Kagermann et al. (2013), Stock and Seliger (2016) | Porter (1980), Barney (1991), Porter (1985) | Barney (1991), Cyert and March (1963), March (1991) |

[a]Selection of high reputation journals include: Academy of Management Journal, Academy of Management Review, Administrative Science Quarterly, Journal of Management, Journal of Management Studies, Organization Science, Strategic Management Journal.
[b]Limited to the 2000 most cited publications. We removed the Eisenhardt (1989) publication from the general management and platform samples, as it is a method article.

of 0.015 per cent for the platform sample. In comparison, the fractional citation rate for the control sample (general management) is 0.72 per cent; nearly five times higher as the in the most citing sample for new organizational forms.

Thus, we believe that research on new forms of organizing, such as internet and network-based organizations, ecosystems, as well as the rise of decentralized ledgers supporting smart contracts as seen with blockchains, could benefit from integrating some of *M&S*'s propositions. *M&S*'s underlying logic of individuals having employment contracts and working within a clearly and formally defined hierarchical structure can be rethought to suit the importance of emergent organizations, such as communities of practice and open source software development (Puranam et al., 2014) and the greater importance of systems integration (Hobday et al., 2005)

## Moving Forward

Based on our analysis, we find that *M&S* has been, and still remains to this day, a critical source for any management scholar. As noted earlier, there are three major concentrations of ideas in *M&S*: (1) Organizational structure and control (*Production*, *System* and *Group*), (2) Individuals (*Perceived*, *Individual*, *Alternatives*, and *Action*), and (3) Change and innovation (*Change*, *Activities* and *Program*); therefore, we structure our discussion along these three issues. For *M&S*, these were what the organization organized via the 'problems' it faced, the 'decisions' it made, and the 'behaviors' that it fostered. For *M&S*, it was these interactions, not our separate understanding of each dimension, that was key to understanding the organization. Hence, future research could benefit from revisiting *M&S*'s foundational ideas but perhaps by doing so more holistically as we believe that a strength of *M&S* relates precisely to its integrative approach. Thus, we believe that there are several ways forward to extend *M&S*'s original ideas and its relevance to today's business environments.

Given that our findings highlight the limited impact of *M&S* on some contemporary research fields, we outline some suggestions for future research in regard to new organizational forms, innovation, and to extend *M&S*'s ideas to multi-level research (i.e., widen the level of analysis) (see Table V for sample research questions).

*Organizational structure and control.* In line with Makadok et al.'s (2018) lever 3 of advancing theory ('Where'), we suggest that *M&S*'s ideas should be extended to the context of new organizational forms. For these phenomena, research can draw on important insights developed in the book that relate to the role of organizational structures and how they can help overcome the problems of division of labour and/or integration of effort. The importance of structure is especially relevant given the emerging new organizational form, such as the platform economy, which raises the question around value co-creation between platform or ecosystem partners (Wilden et al., 2017). Looking back at two of the core ideas in *M&S*, namely compensation and incentives, raises important questions about how systems of compensation and incentives in ecosystems and platform-based economies should be structured and controlled. For example, platform organizations such as Uber do not employ the drivers directly, but rather provide employment contracts without fixed salaries. Conceptually, the nature of organizational structures

Table V. Sample future research questions

| | Research gap | Possible research questions |
|---|---|---|
| 1 | Organizational structure & control | How should organizations best design structures and incentivization systems that comprise ecosystem partners – who may be considered as being employees – and make them fulfil important roles in the value creation and delivery processes? |
| | | Given employees can now receive instant feedback on their performance from external stakeholders (e.g., through online ratings), how should organizations design performance evaluation systems? |
| | | How do the division and allocation of tasks, the provision of rewards and information, or the nature of goal setting and performance feedback influence how individuals recognize and notice potential issues (i.e., focus of attention), diagnose situations (i.e., problem representation and formulation), and search for solutions (i.e., deliberation and reflection) in the intrafirm and interfirm contexts? |
| 2 | Individuals | How do we need to rethink individual motivation when the individual is committed to several stakeholders? |
| | | Given the increasing importance of middle-level managers, how do their motivations and incentives differ from top management teams? |
| | | How can organizations still support boundaryless employees in their career development and advancement? |
| 3 | Innovation & change | What are the optimal organizational structures to motivate and incentivize employees to share and absorb innovation across organizational boundaries? |
| | | How can external crowds as employee substitutes be motivated and incentivized to act in the best interest of the organization? |
| | | How can organizations motivate and incentivize employees to engage with external stakeholders to foster innovation and accept external ideas? |

is still paramount to understand these platform organizations but the structures and mechanisms that need to be put in place are very different from what is described by *M&S*. For example, performance evaluation in such organizations has often become very open with public feedback contributing to the driver's (i.e., employee's) reputation. Similarly, websites such as Yelp provide public performance feedback mechanisms for organizations and their employees. Thus, future research is needed to understand the role of customers in the performance evaluation process. Consequently, *M&S*'s ideas may thus help to extend consumer-related research on access-based consumption and platforms enabling these services (e.g., Zipcar). Such research has found that besides formal control mechanisms to guide behaviour, such as penalty systems and formal rules,

the organization uses social control mechanisms 'enforced' by the brand community (Bardhi and Eckhardt, 2012).

The locus of competition and value creation has shifted from the individual organization to an ecosystem of organizations. Therefore, Boudreau and Lakhani (2013, p. 69) called researchers and industry alike to 'put as much energy and intelligence into designing systems for organizing work outside company walls as we do for work within them'. Our analysis shows that *M&S*'s ideas have continually been extended by citing authors to suit their research area. For example, research addressing new forms of organizing have extended the initial ideas to the context of alliances and inter-organizational collaborations, although these organizational forms were not part of the book. Along these lines, we see many opportunities for future research to update and extend *M&S* beyond the scope of the single organization; in particular to encompass new organizational forms and the challenges of Industry 4.0. The current trend of automation and data exchange, the 'Internet of Things', cloud computing, and cognitive computing invites to revisit some of *M&S*'s insights. Sako and Chondrakis (2015, p. 3), for instance, state that 'the two strands of research, one on firm boundary and the other on intra-firm organization design, have been conducted in parallel without much connection between the two'.

An important idea suggested by *M&S*, and further developed by later publications of the Carnegie School, relates to the importance of the relationship between organizational structures and decision-making. It has led many scholars to study how organizational structures guide the way information is processed and, in turn, how decisions are made. Many important research streams such as behavioural strategy, theories of attention, and cognitive perspectives have been influenced by this work and are influential in contemporary business research. *M&S*'s conceptual insights about the influence of organizational structures bear very important implications to understand the pattern of communications and relations both within and across firms. A recent example drawing upon this information-processing view of organizational structures is the study by Lumineau (2017) who applies this logic to the influence of contracts on trust development. He argues that the type of contract design – through its respective focus on controlling and coordinating aspects – induce specific calculative and non-calculative mechanisms behind the development of trust. We see and encourage future studies to extend this line of enquiry to further analyse, for instance, how the division and allocation of tasks, the provision of rewards and information, or the nature of goal setting and performance feedback influence how individuals recognize and notice potential issues (i.e., focus of attention), diagnose situations (i.e., problem representation and formulation), and search for solutions (i.e., deliberation and reflection) in the intrafirm and interfirm contexts.

*Individuals.* In line with Makadok et al.'s (2018) lever 2 of advancing theory ('Who'), we stress the importance of future research addressing the above issue of new forms of organizing by bringing together different levels of analysis; that is, linking the micro-level (individuals) with the meso-level (organizations). Thereby, we believe that research can benefit from continuing to draw from, and thereby extending some of *M&S*'s ideas. New technologies continue to change the nature of work, and thus motivation and incentivization. Much of *M&S* focuses on individuals in organizational context who make decisions and engage in social behaviour. However, limited research has

used a *M&S* perspective to focus on the individuals in these new forms of organizing. Organizational design aspects influence how boundedly rational individuals focus their scarce attention and interpret informational cues. Judgment and decision-making are influenced by organizational structures that guide selective attention to organizational issues. Organizational structures shape the nature of the actions taken by individuals to gather information when making decisions. That is why it seems particularly relevant to further combine the individual and organizational levels (Puranam et al., 2014).

An example of how *M&S* can inform multilevel issues is the impact of new organizational forms on the behaviour of and consequences for the individual employee (Randhawa et al., 2019). Opening firm boundaries has also affected traditional employment models, which requires reinterpretation of some of *M&S's* core concepts, such as individuals' motivations, goals, decisions to contribute to or leave the organization, as well as employee turnover. For example, General Electric's Geniuslink enables organizations to implement tech-enabled and crowd-powered work models by providing them with experts when needed, thereby implementing project-based organizing (Biesenthal and Wilden, 2014). Related, the responsibility for careers has shifted from organizations to workers, leading to a more individualized career orientation (Gubler et al., 2014b). The concept of boundaryless careers stresses individual's careers as being independent of traditional organizational career structures (Arthur and Rousseau, 2001), given that employees move across organizational boundaries of separate employers; seek and find validation and marketability from outside markets; and break away from existing ways of hierarchy and career advancement (Gubler et al., 2014a).

The changing nature of industries towards the importance of ecosystems and platforms also affects the nature of psychological contracts between organizations and employees. Much of previous research on psychological contracts has largely focused on the individual employee level of analysis (Baruch and Rousseau, 2019). For example, Baruch and Rousseau (2019, p. 3) stress the importance to 'assess employment-related exchange arrangements beyond the individual worker and an employer, where participants (workers, managers, employers, clients, team members, network partners, etc.) develop multi-faceted psychological contracts across several stakeholders', which also operate across different organizational levels. In platform organizations such as Uber, *M&S's* concepts of inducement-motivation, satisfaction, and search can be adapted to be given a 'second youth.'

Finally, we showed that in time periods 2 and 3 upper echelon research drew on *M&S*. Related, and building on *M&S*, the micro-foundations research stream in strategy has provided us with valuable insights into senior managers and their decision-making, including dynamic managerial capabilities with their focus on cognition (Adner and Helfat, 2003; Helfat and Martin, 2015). However, less research has looked at the role of middle managers in organizations, although these employees play an important role in implementing strategies (Balogun and Johnson, 2005; Wooldridge et al., 2008). Notable exceptions are studies by Glaser et al. (2016) and Heyden et al. (2018) who show that lower-level managers initiate and implement change. This is due to these managers more directly being closer to technological and market developments (Fourné et al., 2014). Thus, we suggest that future research should investigate these managers' decision-making processes, their motivations, and how organizations can best design incentives that

align with these motivations, as well as how they design their decisions to exit the organization and pursue future opportunities.

*Innovation and change.* Related to Makadok et al.'s (2018) lever 6 of advancing theory ('When'), we believe that *M&S*'s assumptions need to be more critically applied to the today's context of innovation and change. Linked to the idea of co-creation, today's business environments have also led to core business processes, such as innovation, being distributed across the ecosystem, thereby indicating a need for permeable firm boundaries (Randhawa et al., 2016). Our data have shown that current research citing *M&S* is skewed toward innovation-related topics. Innovation-related research identifies the inability of organizations to organize, control, and conduct all the value chain activities necessary to achieve innovation success in-house as one of the core 'problems' facing firms today. For example, research on open innovation proposes that in order to drive innovation-related activities, organizational boundaries should open up moving to a relational system with external partners (Bogers and West, 2012; Chesbrough, 2006). Consequently, research has looked at innovation as the result of intentional and planned inflows and outflows of knowledge between partners (Chesbrough, 2003; Enkel et al., 2009). This research stream is yet to resolve questions around optimal organizational structures to motivate and incentivize employees to share and absorb innovation across organizational boundaries (Randhawa et al., 2019), for which it could draw on some of *M&S*'s key ideas.

Picking up on the above point of looking at multi-level phenomena, future research could build on *M&S* to better reflect the complexity of the role of the individual in open innovation and strategy perspectives. Even though these concepts are situated at the organizational level, organizations rely deeply on individual actions; for example, firms deploy crowdsourcing by engaging an external voluntary crowd of individuals to gather innovative ideas and solutions (Afuah and Tucci, 2012; Boudreau and Lakhani, 2009; Howe, 2006). Only limited research has investigated the relationships between organizations and open innovation communities and platforms (Dahlander and Wallin, 2006). More specifically, previous research has been critical of the fact that little research has investigated the individual's role and personal motivations in open innovation related activities (Randhawa et al., 2016; Almeida et al., 2011; Hohberger et al., 2015).

An open system of innovation necessarily requires a change in behaviour at the individual level fostered and coordinated by organizational structure, routines, and activities. In *M&S*, internal employees are assumed to conduct all innovation-related processes, and thus need to be incentivized accordingly. However, nowadays organizations complement or even substitute internal employees with external crowds to drive innovation. In this context, Lifshitz-Assaf (2018), investigating NASA, found that engaging in open innovation can only lead to breakthrough innovation when R&D employees adjust their own professional identity. That is, only when employees are able to truly adopt external knowledge and share internal knowledge through refocusing their identity, external solutions will be incorporated. On the other hand, when R&D employees try to implement open innovation without changing their own identity, R&D processes will not change. Related, Randhawa et al. (2019) find that organizational open innovation success depends on the degree of project team motivation to implement crowdsourcing. More

specifically, motivated employees feel a sense of 'reciprocal responsibility' (Hamel et al., 1989), inspires 'organizational members to higher levels of achievement' (Hart, 1992, p. 337), in turn leading to better engagement in open innovation and positive innovation outcomes. Thus, future research is needed to extend the discussions about motivation and incentives to both external crowds as employee substitutes as well as how employees can be motivated to engage with external stakeholders to foster innovation and accept external ideas. While the basic idea of *M&S*'s inducement-motivation can be applied to this context, the intricacies of this relationship are significantly more complex.

## CONCLUSION

In this paper, (1) we provided an empirically grounded *summary* of *M&S*; (2) we empirically *explicated* the impact of *M&S* over time and discussed the influence of *M&S* on current research; and (3) we *envisioned* suggestions for future research. Despite the validity and strengths of the multi-methodological approach we have used, there are limitations to our study. Some are procedural. For example, we opted to exclude books, book chapters, and conference proceedings, thereby limiting ourselves to work that the review process may have forced to conform more to traditional perspectives. This is noteworthy as, particularly during the initial periods of our analysis, books had a more prominent stance in the business field than in later periods. By looking at specific time periods, we also may have lost sight of when critical changes in thinking occurred and erroneously report more stability than was present. Due to the large number of articles included in this study, we conducted the text mining on the abstracts of articles only. Although this is in line with previous research (Huber et al., 2014), future research could identify relevant subsamples of interest, and then run the presented analyses on the full text of the articles. We have attempted to address many of these issues in an Online Appendix.

Our results reveal that *M&S* has had significant influence on academic scholarship, with this effect having arisen in an evolutionary fashion. Scholars have integrated their ideas, concepts, themes and structures to facilitate and enhance their own work across a variety of fields. What is most remarkable is not that this tendency existed but that it appears to be accelerating as more and more scholars are looking to *M&S* for ideas an inspiration (see Table II). Indeed, what makes *M&S* influence so long lasting is the fact that each generation of scholars and each disciplinary variety of scholars still find new and helpful insights when reading the book from their own perspective. Indeed, to echo our introductory quote, *M&S* represents a classic in the sense that it has never exhausted all it has to say to its readers with more and more readers seeming to look to it for inspiration.

## NOTES

[1]  The Louvain algorithm is a greed optimization technique, which tries to optimize the so-called 'modularity' of communities in each network (Fortunato and Barthelemy, 2007). Thereby, modularity is a quantitative measure for the quality of the division of a network into sub-groups (communities) (Newman, 2004); in our case, groups of related research, which are based on the underlying network structure.

[2]  The classification of scientific fields is based on the publication classification by WoS and the classification with Business and Economics is based on the 59th edition of the meta-journal ranking by Harzing (2018).

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