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Do you get the picture?
A review of 'top' American and European journals' embracement of visual research.

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Introduction

This development paper reports work-in-progress at a stage when collection of evidence is less than half-completed. The initial purpose of the research was to examine claims that the conservative nature of American journals stifled innovation and intellectual development in management studies (Colquitt and Zapata-Phelan, 2007). Üsdiken (2010; 2014) identifies five journals from America that he sees as typifying the conservative approaches of the USA in the area of management concerned with organizational studies. These are *Administrative Science Quarterly* (*ASQ*), *Academy of Management Journal* (*AMJ*), *Academy of Management Review* (*AMR*), *Strategic Management Journal* (*SMJ*) and *Organization Science* (*OrgSci*). He contrasts these with four journals in Europe, namely *Organization Studies* (*OS*), *British Journal of Management* (*BJM*), *Human Relations* (*HR*) and *Journal of Management Studies* (*JMS*), that he believes to be more open in their approach. The initial objective of our research was to examine whether American journals appeared any more conservative than European journals in embracing visual methods in the period between 1990-2018. The topic was chosen because there have been claims that in management, as in other social sciences, there has been a "visual turn" whereby researchers operationalize forms of visual communication resulting in visual research in the management area "developing rapidly … [to] a point of maturity" (Bell & Davison, 2013, p. 167).

While the respective, relative conservatism and openness of American and European journals provided our initial question, a second research question emerged in the collection of our evidence to date. The assumption was that the "visual turn" that informed the selection of our empirical focus was recent. It became clear, however, during our research, that there was a history of visual methods being used in a range of ways in business and management research, suggesting a less celebrated history that preceded and continued to accompany the visual turn in business and management research. This gave rise to a second question of what is the exact nature of the 'visual turn', given a less celebrated history of researchers using visual methods?

We organize this development paper to provide tentative answers to these questions in the following way. First we provide a schematic literature review to contextualise the issues of the conservativism of American journals and the linguistic turn. Second, we report our approach to analysing those journals and present some tentative findings on both the relative conservatism of American journals and the nature of any visual turn. Our conclusion reports on our intentions in further developing the paper and what we will seek from colleagues at the conference to assist its ongoing development.

Literature review

Academia has been divided into a centre of America, a second centre made up primarily of the UK, a semi-periphery of Australasia, Canada and a large part of Europe and a periphery of Africa, Asia and South America (Üsdiken, 2010; 2014). Journals from the centre

assume the epistemology of positivism, have a predilection for quantitative methods and the hypothetico-deductive scientific approach, and aspire to develop nomothetic, universal statements similar to those found in the natural sciences (Grey, 2010; Üsdiken, 2014 p 768). The implicit assumptions of commonalties facilitating universality provide a constraint that hinders development of alternative ideas and theories so that knowledge has not progressed in journals at the centre (Colquitt and Zapata-Phelan, 2007). Examples of top journals from the centre are *ASQ* and *AMJ*, *AMR*, *SMJ* and *OrgSci* (Üsdiken, 2014). Development of the second centre saw the emergence of a second wave – or "second tier" (Grey, 2010, p. 683) – of academic journals which emphasized social difference rather than universalism, were more willing to embrace qualitative research methods and adopted interpretive, postmodern, critical and Marxist perspectives found across Europe (Üsdiken, 2010; 2014). Examples of the second wave of journals are *OS*, *BJM*, *JMS* and the broader social science journal *HR* (Üsdiken, 2014). One way of exploring assertions about some journals' negative impact on academic development is by comparing their coverage of a non-conventional approach to research, with coverage of the same topic by journals reported to be more plural. Consequently, the approach to visual methods of the American and European journals identified above will be compared. The reason for this choice is because of recent reports of a visual turn in management (Bell & Davison, 2013) and other disciplines (Callahan, 2015; Carrabine, 2012; Mitchell, 2014; Pauwels, 2000).

It is easy to understand the attractiveness of visual methods. Visual images have many benefits including permitting representation of ideas, capture and presentation of large quantities of information in limited space, easy representation of processes and chronologies, and reproduction of organizational and managerial artefacts (Langley, 1999). Recognition of this has been facilitated by sponsorship of research and training materials by research councils, international institutes organizing workshops, recently commissioned books and special issues of journals across a range of sub-disciplines in the business and management field - with the consequence of their increasing appearance in a range of research strategies (Bell & Davison, 2013). Paulwels (2000, p. 7) provides a by no means extensive summary of reasons why academics have been engaging with the visual:

> "To capture and reduce complex or ephemeral visual phenomena into a more manageable (permanent, detailed) form."

> "To secure the broader context of visual data (e. g. their spatial organization)."

> "To visualize abstract concepts as an aid to insight."

> "To translate non-visual data (e. g. auditory signals) into visual data (representation)."

> "To complement the verbal and numeric transfer of scientific insight using the varied communicative properties of the visual means."

The principle objectives of this research are, thus, twofold. Firstly, to examine whether utilization and dissemination of visual methods is faster in journals outside of the academic centre to indicate evidence of the stifling of new ways of conducting research. Secondly, to examine whether the evidence indicates the existence of a visual turn and marked changes in the conduct of research.

Method and findings

The design of the research entails reviewing the content of the nine journals identified by Üsdiken(2014) over the period from 1990 – when the last two journals to be established, namely *OrgSci* and *BJM*, but before the visual turn – through to the last full publication year of journals in 2018 to identify whether the pattern of dissemination of ideas at journals in the centre and journals elsewhere are apparent. So far, we have been able to examine articles in *OrgSci* and *AMJ* from America and *BJM* and *OS* from Europe to explore the extent to which the journals from one continent were more innovative than the journals from the others around visual methods. We searched those journals from 1990 by keying "visual" into the search engine in their home page. This gave rise to the number of articles shown in the respective years in appendix 1 in the journals analysed so far. We read those articles and, following the approach for a systematic review suggested by Tranfield *et al*. (2003), we prepared a data extraction sheet for each article, the pro forma of which is shown in appendix 2. The sheets were then read to identify the pattern around the ways in which the visual was being used within journals. This gave rise to the second research question about the nature of any prehistory of visual methods. We then wrote summaries of the nature of the development of visual methods in the articles at each journal. These summaries appear in appendix 3.

By comparing patterns between each summary, we developed an opinion of whether American journals were more conservative than European ones around visual methods. Study of commentaries over time provided an opportunity to assess the nature of the visual turn. Length restrictions necessitate that we document only briefly the following observations about the patterns found to date.

Alleged conservativism of American journals
- The term 'visual' has become increasingly commonplace in journals over the period, but often this is not to do with visual methods;
- Journals in Europe may be less conservative than those in the USA in embracing visual methods, as there was more regular evidence of extensive use of these methods in *BJM* than there was in *AMJ*;
- Such a difference should not be overstated, because the focus of *OrgSci* that includes design often involved the use of more visuals.

Nature of the visual turn
- Visual considerations tended to be discussed in all journals studied so far when: conceptualizing ideas through visual representations at any stage of a project; reviewing literature; designing research; collecting evidence; analysing data; and presenting findings. Evidence of 'the visual' being used in this way was found at all of these stages, although never jointly in the same article;
- Visual approaches have always been part of the methodologists' toolbox, with common examples including observations, card-sorting and concept mapping;
- While articles giving coverage to visual research are increasing, the visual turn is partly a consequence of visual moving from being a subterranean component receiving less attention when projects are written up, to a more conscious and celebrated part of enquiries.

- The number of ways of collecting visual evidence are increasing. However, there has been limited development and use in ways of analysing qualitative visual evidence, with the most common being use of timelines and visual mapping. There are rare instances of semantics with visuals seen as a type of symbol;
- Advances in computerization has resulted in more extensive development of visual tools for analysing quantitative, statistical data;
- Advances in publication technology appears to have contributed to increasing use of a variety of visuals in academic articles.

Concluding discussion

Communication between academics often manifests in textual contributions and debates in articles in academic journals. Such records permit sharing ideas across temporal and geographical spaces. However, reliance on text may restrict understanding and other responses, particularly when any empirical phenomena that are reported are multi-dimensional. Visual methods have the potential to capture and convey other dimensions of a phenomenon that cannot be conveyed easily by words - and so there has been a visual turn. . This article reports work-in-progress. Thus, definitive answers are not possible. Nevertheless, journals in Europe appear more open to alternative perspectives than their counterparts in North America. However, the continent of origin may be a weaker influence on the receptiveness to visual studies as the general focus of the journal. In considering the idea of a visual turn, research techniques that require utilisation of visual faculties have been employed for some time. In many instances, this has been either under-reported, or has only taken place at one stage of the research process. Since the visual turn, some articles appear to be simply adopting a more positive celebration of the importance of visual evidence which gives it a greater centrality in the articles. There are, however, some articles that have a more central utilization of visual methods. Given that articles generally take at least three years to prepare and get published, and the visual turn is recent, one may perhaps expect a greater number of articles adopting visual methods in the future.

Our research approach is emergent. We have read only those articles that contain the terms visual. We need to examine all articles in those journals to examine whether they examine visual issues using other terms. By the time of the conference, we would have hoped to have finished analysing the nine journals and considered the way in which this research could be developed, both along disciplinary lines and by sub-dividing regions into countries. We will seek the advice of the conference on the value of the research topic and on how to make further improvements to our method.

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Appendix 1 – Number of articles in journals per year in which keyword of "visual" appeared.

	AMJ	BJM	OrgSci	OS
1990	4	1	0	3
1991	1	3	1	3
1992	1	2	0	2
1993	9	0	0	4
1994	2	6	0	1
1995	5	0	0	3
1996	1	4	0	2
1997	2	2	1	5
1998	2	0	3	3
1999	3	0	6	0
2000	1	0	5	0
2001	0	0	2	3
2002	3	1	1	6
2003	3	3	4	8
2004	4	0	4	10
2005	2	1	4	12
2006	4	0	6	8
2007	8	3	8	12
2008	4	3	3	12
2009	2	2	7	10
2010	8	2	7	14
2011	2	2	18	9
2012	3	4	13	15
2013	10	4	6	18
2014	5	7	11	19
2015	7	10	8	11
2016	10	4	10	20
2017	9	2	11	28
2018	22	6	8	46
Total	**137**	**72**	**147**	**287**

Appendix 2 – Data extraction sheet used

Journal in which article appeared, volume, issue, year and page numbers:	
Whether article appeared in a special issue or regular issue:	
Section of the journal in which the article appeared:	
Location of journal's base: For example, USA, UK, Australia, etc.	
Location(s) of editors-in-chief of journal at the time of publication:	
Title of article:	
Author(s) of article and their location(s):	
Objectives of article:	
Type of article: e.g., empirical, theoretical, methodological of how to use, pedagogical of how to teach visual methods.	
Purpose of use of visual methods: i.e., part of literature review, collection of evidence or analysis of data.	
Particular type of method use: e.g., systematic or narrative literature review documenting visual methods, videos in evidence collection or elicitation in analysis.	
Justification for use – or discussion – of visual methods: e.g., salience of visual data in understanding phenomenon	
Solely visual methods used, or part of broader strategy such as a case study, or whether existing methods – such as story-telling – adapted to include visual:	
Epistemological stance of authors, whether stance stated explicitly or implied and if the latter what is it implied from:	
Comment on generation of technology used: For example, does the technology used in the visual method involve the use of the internet?	
Use of any visual data in paper? what is shown, in which form(s), and why and whether this is part of evidence from study or figures depicting relationships as routine use of visual aids?	
Reference to visual issues in empirics if a non-visual study: For example, reference to notice boards, conveying messages to workers, etc.	

Appendix 3 – Commentaries on the pattern of articles in different journals using the term visual.

For the purpose of the commentary, the analysis is divided into three periods which for simple convenience is divided into decades of 1990-9; 2000-10 and 2011-2018; so the start of the analysis period, the intermediate period and the late period respectively. These analytical timescales are not intended to have any other significance.

<u>**Academy of Management Journal**</u>

According to the Academy of Management Journal (AMJ) website[1], "[t]he mission of *AMJ* is to publish empirical research that tests, extends, or builds management theory and contributes to management practice. All empirical methods including, but not limited to, qualitative, quantitative, field, laboratory, meta-analytic, and mixed methods are welcome. To be published in *AMJ*, the research must make strong empirical and theoretical contributions and the manuscript should highlight the relevance of those contributions to management practice."

Given this emphasis, someone might expect quite a few visual studies in especially the most recent years in this journal, certainly if the so-called 'visual turn' in management studies can be witnessed in AMJ (Bell and Davison, 2013). However, this is not the case. Even though 137 research articles containing (variations on) the expression 'visual' have been published in the journal in the 1990-2018 period, only three of these may be called visual studies[2].

There is a clear preference for statistical and experimental research methods in the journal, as well as for pure theoretical/conceptual contributions. This does not seem to cover all of AMJ's aims as expressed on its website. The number of replication studies is also striking. From approximately 2006 onwards, more qualitative and interpretive studies appear in the journal. An emphasis on theory building and statistical analysis is evident throughout, however, as is an emphasis on research based on a mainstream paradigm, which is infused by realism and positivism (Chua, 1986).

1990-1999

There are 30 research articles containing the word 'visual' (or extensions of it) published in the journal in this period. However, only one of them might have been developed into visual study: an article on speech patterns and cognitive mapping in bargaining negotiations, written by Simons (1993). Like many articles in AMJ, it ultimately turns into a different, quantitative article in which hypotheses are tested, but before that happens, it is asserted that negotiation partners' conceptualization of the notion of 'utility' may be a key constitutive component of their cognitive maps (i.e., their internal representations of these negotiations), influencing their assumptions on how the negotiations may develop. The discussion on cognitive mapping discusses visualizations that people make in their minds. However, the article turns into an analysis of 79 transcripts from two negotiation studies. These show that when utility

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[1] Refer to: http://aom. org/Publications/AMJ/Welcome-to-AMJ.aspx. Accessed on February 7, 2019.
[2] Before 1990, 49 research papers used the word 'visual', but none of these are a visual study.

is conceptualized as a subjective preference, more integrative agreements are reached than in case negotiations partners believe utility is external to their own impressions.

There is also an overview article, using content analysis, by Bartunek, Bobko and Venkatraman (1993) published in AMJ in this particular decade, about innovation in management research methods, but this article does not discuss visual methods in detail either.

2000-2009

31 References to the word 'visual' can be found in AMJ in this particular decade. These mainly refer to visual inspections associated with statistical analyses; data overviews (e.g., in graphs); and flow charts/diagrams depicting the evolution of the research and/or a summary of the main findings. There are quite a few studies that contain visual data, but these are not as frequent as in, for example, Organization Studies (which is discussed below).

There is one visual study published in the journal in this decade: Yakura (2002). This article investigates the use of visual artifacts to represent time, and focuses in particular on so-called "Gantt charts". These are timelines expressed in charts, of which the author surmises that they get to be woven into organizational life by organizational members. The latter manage time prospectively and retrospectively to make sense of these charts as they are being pushed down in their organization. They may be interpreted as temporal boundary objects that are both flexible and robust. Yakura's article offers an insightful illustration and understanding of how these charts are used. The article also discusses several examples of these charts.

2010-2018

This decade has yielded two visual studies so far, while the word 'visual' has been used in 89 articles. Perhaps even more than in the previous decade, there are articles containing visual data, but again these mainly refer to the output of statistical analyses and the presentation of research findings.

Grant, Berg and Cable (2014) analyze what happens in organizations when organizational members are allowed to create their own job titles. These, the authors assume, can subsequently serve as 'identity badges'. Their analysis consists of two parts. In the second part, an experiment is conducted in a health-care organization, but the first part may be interpreted -at least in part- as a visual study illustrating how people react to self-created job titles in the Make-A-Wish Foundation. In this part of the analysis, interviews, observations, and archival documents are combined to identify three explanatory mechanisms through which self-reflective job titles may operate: self-verification, psychological safety, and external rapport[3].

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[3]Helms and Patterson (2014) conduct a qualitative study to assess the positive implications that stigma may have for organizations. They look at audience perceptions of several mixed martial arts (MMA) organizations. They do this through an analysis of interviews, media reports, and texts documenting their experiences. Some of the media reports include visual data. Helms and Patterson conclude that stigmatized organizational members can help persuade audiences to reconsider their

Glaser (2017) describes the outcome of an ethnographic study in which she examined how organizations deliberately design and employ artifacts to change their routines. A law enforcement agency is analyzed, and it is shown how the agency fabricated a game-theoretic artifact to modify its patrolling routines. Based on these insights, a theoretical model is developed that illustrates how organizational members may iteratively engage in a series of design performances to develop and establish new routines.

Relatively speaking, there are far less mentions of the 'visual', or for that matter, of visual studies, in AMJ than in many of the other journals analysed for this article. The mainstream paradigm (Chua, 1986) has clearly dominated AMJ even since it was established in the late 1950s. Statistical analyses and experiments are (still) very much seen as the 'way to go'.

British Journal of Management

1990-1999

The term visual was employed first by Robertson (1990), who used a crude diagram to demonstrate a conceptual or theorized reciprocal relationship between two people in a particular context. Visual representations started to appear frequently in articles by Lee *et al*. (1991), O'Farrell and Moffat (1991) and Proctor (1991). Yet in some ways, visual methods were clearly being underutilized as O'Farrell and Moffat report on the existence of visual phenomena and Proctor reports on a conceptual tool for visual representation. In both instances, this is reported as text. This reporting on visual phenomena in text increased in subsequent years. For example, Ferlie and Bennett (1992) report that posters promoting safe sex were part of the phenomenon that constituted their empirical focus. The use of visual representation increased and could be found in articles such as those by Oliver et al. (1996).

The Ferlie and Bennett (1992) article was also important as it marked early evidence of what may be considered as the pre- or accompanying history of visual methods of where the visual is used as a routine part of the research process, but it is understated. In Ferlie and Bennett's case, observations were used as a subsidiary element of a case study, although the authors did not indicate a visual tool for analysing that evidence. The pre-or accompanying history was also found in Rasheed and Prescott (1992), who use a visual analysis of patterns of plots of variables presenting data collected from a questionnaire to decide what type of statistical techniques to employ. The continuation of this pre- or accompanying history was promoted in part by techniques transplanted from cognate disciplines as two papers (Daniels *et al*., 1994; Elliot, 1994) were informed by psychology and incorporated the logic of visual aids either providing stimuli to the mind or being a tool to help cognition. Ackermann and Belton (1994) also used the visual technique of cognitive mapping that is derived from psychology when conducting their research. This pre- or accompanying history continued throughout the period. Similary, Thomas and Ramaswamy (1996) also used visual methods as a subordinate element in research. They piloted a survey with students and used dendograms or diagrammatic taxonomies to understand the relationships between key variables before

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negative evaluations of MMA. We consider this paper to be a borderline case of a visual study. It has not been tabulated in our summary table.

sending out their questionnaire to their targeted population at the Fortune Top 500 companies.

The Ackermann and Belton (1994) contribution is also significant because this is the first study where there is a report of the use of information and communication technology – in the form of portable computers – to enable the use of utilization of visual methods in the gathering of information by permitting graphical representations to be shown to groups.

There is evidence that authors were becoming increasingly aware of visual methods as some (Hayes and Allinson, 1994; Johnson and Powell, 1994) either made reference to literature discussing visual research, or discussed conceptual issues such as learning styles where the visual was considered important (Hayes and Allinson, 1996). The view of visual methods during this period was not uniformly positive. For example, Oliver et al. (1994) suggest that the visual offers only a superficial understanding of phenomena, indicating that while plants that appeared to exhibit facets of lean production through visual inspection, deeper analysis of their performance suggested a contrary message. To be fair to Oliver et al. , there was an article in a subsequent year (Oliver *et al*. , 1996) where the use of the visual formed a subordinate part of the research. These authors report an empirical study that entailed visits to factories where lean processes were observed which included a number of visual phenomena such as light signals when something was wrong and public displays of other production information. This initial visual gathering of data was then used in the preparation of a questionnaire and it is the research from the questionnaire that is reported.

Towards the end of the period, there was the appearance of shoots of what might be considered to be a conscious attempt to develop visual methods. Hardy and Clegg (1997) prepared a review article in which they discuss the objective of reflexivity and their discussion includes how visual techniques may provide an aid to reflexivity. Linstead (1997) also provided a review article, which focused on how the immersive approach of ethnography found in social anthropology may inform education and research in management and the visual was presented as a form of communication in anthropology that may be used in management.

2000-2009

The work by Hardy and Clegg (1997) and Linstead (1997) may have articulated an overtly positive role for considerations of how to use the visual in management research, but it did not precipitate a flood of articles using such methods. Even when visual phenomena appeared in the empirical focus, any consideration of visual methods remained subterranean. Bowen (2002) provided a rare reference to the visual when discussing environmental issues and how publicly-sited communications technologies of smaller base stations and better-disguised masts were considered to mark ergonomic improvements, but this message was conveyed through text. Another paper where the phenomenon involved the visual, was Mitchell *et al*.'s (2003) examination of the importance of unit price in consumers' behaviour through a simulated task in an experiment which involved the use of visual skills. However, there was no attempt to convey the importance of the visual through visual means in the text. The prominence of visual phenomena in the empirical foci of studies without being captured by

visual methods continued in a number of articles throughout this decade. De Cock et al. (2005) conducted research into print advertisements of companies that formed part of the new internet economies and although some advertisements had visual dimensions, these are neglected and it is only the text in those advertisements that is noted and analysed. Cornellissen *et al.* (2007) studied corporate identities and was aware of visual resources such as logos from the literature review, but this is not followed through into the empirics. Fraser *et al.* (2007) investigated self-generated employment bias and although they suggest that visual prompts could be used to help overcome bias in recall, there is no use of visual methods.

There was some evidence of visual representations being used to represent ideas when writing up research. For example, Butler (2003) uses a figure that depicts the role of receptivity in organizational change. Rueda-Manzanares *et al.* 's (2008) article contains two figures that provide a visual representation of the relationship between variables in their research. Meyer and Stensaker's (2009) article included visual timelines of change. Smith and Sparks (2009) reproduce scatter diagrams from their analysis in their article.

The existence of the pre- or accompanying history of visual methods was not always evident at this time, even when it might have been expected. For example, Butler (2003) reports a case study approach in an empirical study of organizational change, but there is no mention of visual methods being part of that. Similarly, in Rueda-Manzanares *et al.* (2008) report that visual impact is an important variable in their exploration of ski resorts, but there is no indication of how they operationalised such a variable. Evidence of the pre- or accompanying history of visual methods first appeared in this decade in Tranfield *et al.* 's (2003) article on the conduct of systematic reviews which introduces the visual into an initial stage of work by describing how preparation of data extraction sheets for each work reviewed provides a visual aid when evaluating that literature. Another instance of a pre- or accompanying history was manifest in Smith and Sparks' (2009) study of the redemption behaviour of customers using retailers' loyalty cards using qualitative interviews and statistical analyse of the receipts of transactions, the latter of which are organized into scatter diagrams for visual perception.

Some articles towards the end of this decade appeared to mark the formal advent of visual methods, albeit as studies that consciously sought to design a research study that included visual methods. For example, Oliver and Roos (2007) used photographs and video-recordings as part of their compilation of evidence in case studies that explored organizational identities by getting organizational members to work with three-dimensional toys. In 2008, Kosmala analysed how women are represented at work in the critical practice of a number of female artists. Kosmala's article appeared in a special supplement on gender and is also responsible for visual being alluded to in Broadbridge and Hearn's (2008) introduction to that section. Meyer and Stensaker's (2009) article on the tactics that political leaders used to include or exclude different stakeholders in the course of political reform, included a period of full participation by one author and a temporal bracketing strategy involving a timeline was used in the analysis.

2010-2018

The appearance of articles seeking to make positive use of visual methods appeared continued into this decade. Stensaker and Langley's (2010) empirical investigation into the role played by divisional change agents in the implementation of a planned organization-wide change, used observations in case studies that included interviews and documents in the collection of evidence and then used visual mapping to show sequences in the analysis of interview data. Tanghe *et al*. (2010) conducted two experiments into trust and distrust; in a scenario experiment, participants were shown photographs with a work colleague displaying a particular emotional state to help guide decisions; and in a laboratory experiment, photographs – which had been facilitated by development of digital technology as those photographs were taken as participants entered the building - of other work colleagues with whom the participant had been grouped were used to increase emotion at a time when decisions were being made. By the time of Conway's (2014) article, BJM had introduced a new section - Methodology Corner - and this article appears there and contains literature that reviews the history of mapping of networks and provides a critique of network visualization software as well as a number of diagrams providing different ways of portraying networks. Fujimoto *et al*. (2014) also included visual – alongside textual – methods of analysis in the form of visual mapping techniques to show relationships that had been established through textual data gathered in interviews and from documents. Illia *et al*. 's (2014) article in the Methodology Corner section used a computerised text analysis program, ALCESTE, to generate a number of visual representations – including distance trees, ascending hierarchical diagrams and longitudinal and correspondence matrixes. Ogbonna and Harris's (2014) study of enduring organizational culture at a football club draws on empirical evidence through extensive non-participant observation and archival research that included scrutiny of videos and photographs as part of a case study that also utilized interviews and focus groups. However, like other studies, the visual dimensions of the evidence appear to be reduced to text at the analysis stage. Demir's (2015) conducted an in-depth qualitative case study of a bank that included periods of observation and participant-observation to collect evidence and which also entailed an iterative abductive approach to analysis which included practice mapping of how different actors' actions were linked. Jarzabkowski *et al*. (2015) conducted a video-ethnographic study of the application of strategy in a financial trading context in which visual evidence was collected through observations and videos which were used to analyse the sequence of events which included the use of material resources that had a visual dimension such as spreadsheets and computer screens. Paroutis *et al*. (2015) studied how strategic knowledge was produced through in workshops and collected empirical evidence through observations and video recordings which were then analysed and organized temporally using photos and diagrams. Werle and Seidl's (2015) longitudinal case study included observation of a strategizing process which led to the generation or collection of material artefacts including photographs, technical drawings and sketches that had a visual dimension. Both textual and pictorial artefacts were analysed in an iterative, inductive form of theory building. Garreau *et al*. (2015) explored how practitioners perform strategic sense-making through visual representation and their empirical evidence included observations while visual artefacts were used to facilitate discussions of strategy. Knights and McCabe's (2015) research included the study of corporate videos as part of a study of a discourse of leadership in a building society. Notably, this paper provides a justification for using a method for collection of visual evidence, but for only offering a textual analysis of the evidence. Kaufman *et al*. (2016) utilized the development of the internet to conduct an on-

line experiment into age discrimination and they used either the date of birth or a photograph with a CV to assess the impact of act on potential recruitment. Chatzidakis and Shaw (2018) build the use of visual methods into their evidence collection stage by asking interview participants to prepare by selecting 8-12 images that represented their thoughts about the empirical focus of sustainability.

There was also evidence of awareness of visual issues through reviews of literature that had conducted visual research (Broadbridge and Simpson, 2011; Brewis, 2014; Dameron *et al.* , 2015; Belmondo and Sargis-Roussel, 2015; Paroutis *et al.* , 2015; Garreau *et al.* , 2015; Wells and Nieuwenhuis, 2017).

Other studies in the period continued to use visual methods as a subsidiary method of either data collection or analysis. Davenport and Daellenbach (2011) supplemented their interviews by observations in a study of a virtual research centre. Hotho *et al.* 's (2012) comparative case studies of two subsidiaries of a Fortune Top 500 company investigated how individual behaviour translated into absorptive capacity and utilized a week long period of participant-observation at the evidence collection stage although was only a small part of the fieldwork and analysis appeared to be primarily of the textual information. Miozzo *et al.* (2012) conducted interview-based case studies, but the analysis included face-to-face meetings and email discussions that involved PowerPoint plots sent as attachments that suggested visual methods were part of the analysis stage, although this was not explained. Muurlink *et al.* 's (2012) case studies into how new firms responded to internal and external threats included observations alongside interviews and collection of documents while visual methods in the form of concept mapping were also used at the analysis stage. Rocha (2012) conducted statistical analysis of financial data but used social network tools of maps and hierarchical clustering to analyse interlocking directorships. Arnaud *et al.* (2016) used non-participant observation as part of a case study that also involved interviews and collection of documents and which were analysed together to identify the sequence of strategy formulation. Nicolini *et al.* (2016) used a number of visual methods – most notably, a time-ordered matrix, a content analytic table and a scatter plot – to analyse textual information that they had gathered from interviews and historical documents. Nyberg *et al.* (2018) identify discourse analysis – which they use – as a way of interpreting visual representations as well as text, although in their analysis of four public enquiries into fracking, they only analyse the oral and textual information in reports. Papazu and Nelund (2018) used participant-observation, but there does not appear to have been any meaningful analysis of the visual evidence. Visual dimensions being subsidiary parts of other evidence were also apparent in two articles that appeared on-line in 2018, but were yet to be published in hard copy. Tregaskis and Almond (forthcoming) use a software assisted package to generate network visuals from information that had been obtained about networks in interviews. Damanpour *et al.* (forthcoming) also provide an example of the way in which numerical or statistical data is translated into a visual image.

There was also an increasing use of visual aids in the reporting of research. Davenport and Daellenbach's (2011) article contains diagrams showing co-publication relationships of members of a virtual organization. Pascal *et al.* 's (2013) article developed a novel approach to design which is shown as a visual representation in the article. Aalbers *et al.* 's (2014) case study was of networks and diagrams showing networks appear in the article. Fujimoto *et al.* (2014) provided a visual map representing the relationship between different sources of data

in a study. Illia *et al.* (2014) have a number of visual representations – including distance trees, ascending hierarchical diagrams and longitudinal and correspondence matrixes – that show the co-occurrence of text, generated by a computerised text analysis programme, ALCESTE. Paroutis et al. (2015) included photos and diagrams that showed interactions in workshops. Healey *et al.* (2015) utilized a diagram to show the relationship between their hypotheses. Garreau et al. (2015) included pictures of artefacts. Arnaud *et al.* (2016) represented the sequence of strategy formulation which was their empirical focus, in diagrams in the article. Dolfsma and van der Eijk (2016) provide a visual representation of a network. Kaufman et al. (2016) reproduced photos of headshots that they used in an on-line experiment. Chatzidakis and Shaw (2018) use diagrams to portray the relationships between the factors surrounding sustainability in which the authors were interested. Tregaskis and Almond (forthcoming) included network visuals that were generated by a software assisted package. Damanpour et al. (forthcoming) also use a diagram representing the relationship between variables in numerical or statistical data.

In some articles, references were made to visual dimensions of the empirical focus, although there is no attempt to capture that visually. Akbar and Tzokas (2013) analyse various new product development projects and although the article reports that one of those projects entailed visual phenomena manifest in perceptions and social media spaces, no visual methods were used. Similarly, Tregaskis *et al.* (2013) report on how a safety video in their study of high performance work practices had an emotional effect on the workforce although there is no attempt to collect or analyse evidence of this. Mavin *et al.* 's (2014) article exploring women's relationships includes literature that reports that micro-aggression can involve visual insults. Purchase *et al.* (2018) report on visual dimensions of presenting a religious identity, but they do not report on any methods of collecting and analysing that visual data. Akbar *et al.* (2018) report on the empirical focus of a marketing project that included visual dimensions, but there is no clear indication of whether evidence of these dimensions were collected.

Organization Science

1990-1999

The focus of Organization Science as a journal means that one of its central features is the way in which different environments are constructed and their impact. As a consequence, ideas about artefacts – and the visual dimensions of artefacts feature prominently. It is, thus not surprising, that what may be consider a trail-blazer in terms of the range of documents with visual dimensions that were reported to be useful appeared in Meyer (1991). This trail-blazer article included a map, schematic faces, a drawing of clerical work before and after computerization, an executive's drawing representing his organization through the metaphor of a vehicle, a CEO's diagram representing the enacted environment of the hospital which he led, a flowchart representing a budgetary system, diagrams showing computer-generated schemes of industry environments and a written illustration of a Chinese word.

The rest of the period tends to contrast markedly with this trailblazer article. There was one article by Kraut *et al.* (1998) in which the empirical focus involved visual dimensions as the use of two video-telephony systems was studied in an organization over time, although this

was not by visual methods. There were also two articles that appeared in the period by Dooley and Van de Ven (1999) and Levinthal and Warglien (1999) where the objective was simply to develop concepts and theories and they utilized diagrams in the text to help convey the ideas. In this sense, the articles may be considered part of the broader pre- or accompanying history to visual studies. The first – and only – article in the period that consciously and deliberately draws on visual methods was prepared by two UK-based authors, namely David Webb and Andrew Pettigrew (1999). They used visual methods in their analysis which involved different forms of temporal mapping of strategies by firms in the UK insurance industry.

There was an instance of potential opposition to visual dimensions while suggesting their importance in an inverted way. DeSanctis and Monge (1999, p. 696) provide a discussion of visual phenomena that argues not only that visual phenomena do not disrupt the functioning of communication in virtual organizations – where there is no face-to-face contact – but also that "removal of visual cues may actually improve the quality of message understanding, at least in some cases, by removing the distraction of irrelevant stimuli". There was only other article that used the term visual in this period, but it had no visual dimension whatsoever (Hatch, 1998).

2000-2009

There are a small number of articles in this period that consciously and deliberately operationalised visual dimensions in their research. Rafaeli, Sagy and Derfler-Rozin (2008) conducted a fieldwork study to observe whether there was a variation in the level of trust of people when accepting food in the street from distributors wearing a familiar brand logo, an unfamiliar brand logo and no brand logo. Katz and Te'eni (2007) conducted an experiment involving dyads of students who are situated in different places to examine the impact of contextualization in computer-mediated collaboration. The experiment entailed simulation of visual, experiential and textual information. Although there are visual slides in the article, the results are analysed statistically. Barry and Rerup (2006) is interesting because it is one of the most visual of visual methods studies to date, using both observations and participant observation to collective evidence on two disparate phenomena, although the analysis is more textual than visual. Yoo, Boland Jr. and Lyytinen (2006) conducted a case study of four organizational structures from one architectural agency and collected a lot of visual information. The authors attempted to analyse the visual dimensions of that information in a meaningful way. Dodgson, Gann & Salter (2007) report their case study in which participant-observation is used to collect evidence and diagrammatic floor plans are used to analyse interactions.

Visual evidence being used in a way that is consistent with the idea of pre-or accompanying history of visual methods, without there being strong centralization and articulation of their merits, was found in a large number of articles. Montealegre (2001) reports that as part of case study, on-site observations were used alongside interviews and collection of documents, although it is the textual information rather than the observations that are reported as analysed. Similarly, Bechky (2003) conducts a year-long ethnography involving participant-observation and collects important artefacts that have a visual dimension such as engineering drawings and product prototypes, although there is no indication that they were analysed

systematically. Bechky (2006) conducts another ethnographic study of film sets which again involves participant-observation. Analysis of observational data was not articulated. Brusoni and Tronchetti (2006) appear to have used visual methods at both the stages of collecting evidence and analysing data, although these are not explained. The ambiguity in methods is even more evident in the case study reported by Kellogg, Orlikowski and Yates (2006) because use of visual data was not explained. Pitsis, Clegg, Marosszeky and Rura-Polley (2003) also uses observation, but the visual dimensions are not analysed. Chiles, Meyer and Hench (2004) conduct a case study which collects photographs and includes observations and they use visual or chronological mapping in the analysis, but there does not appear to be a complete correspondence between the methods of data collection and analysis. Tschang (2007) entails an ethnography involving observations, but these are not articulated as being part of the analysis. Salvato's (2009) research is effectively a case study of an organization that had 90 innovations which provided the empirical focus. The collection of evidence included archival documents that showed pictures of products, etc. Part of the analysis also involved preparation of a visual image of the innovation process, although this appears to be subsidiary to the use of algorithms to identify statistical relationships.

A number of articles appeared in this period that used visual methods as a subsidiary part of research where the substantive component entailed statistical analysis. Owen-Smith & Powell (2004) used visualization maps in the analysis of contractual relationships between different organizations but the strength of those relationships were defined using regressions. Fleming, King and Juda (2007) use visual analysis and representations of networks as expressions of quantitative measures of data calculated using a hierarchical clustering technique. Sidhu, Commandeur and Volberda (2007) used graphs to interpret statistical information and to represent those relationships in the article. Rothaermel and Alexandre (2009) convert statistical relationships into computer-generated three dimensional figures to provide a visual image.

There are other articles where visual methods may be seen as part of a pre- or accompanying history because although the visual dimensions were used consciously and deliberately, the information could not be gathered through other ways in a more traditional study. For example, Thomas, Sussman and Henderson (2001) collected training videos from archives and used videoconferencing for some interviews. However, this was not done because this approach had a particular visual dimension, but simply because it facilitated a traditional method of interviewing people who are remote and because the broader archives included videos. The information generated is not analysed for its visual representations. Similarly, Phillips & Kim (2009) conducted a quantitative study about the music industry – and particularly jazz – in the early twentieth century and used race as an independent variable. A pictorial catalogue was their only means available to identify the race of the groups.

Barry and Crant (2000), Romanelli and Khessina (2005), Romme and Endenburg (2006) all use visual images of different descriptions to demonstrate concepts or theoretical relationships in non-empirical papers and – in that regard – may be considered to be part of the pre- or accompanying history of visual methods. To a large extent, this is also the case with Winter, Cattani and Dorsch (2007) as they illustrate a model that produces landscapes with computer simulations. The same holds for Rindova and Petkova (2007), where a model is built of how product design – including visual dimensions – affects emotional responses. There is a diagram of that model in the article. This is also the case with Pérez-Nordtvedt *et*

al. (2008). In a similar vein, Sanchez-Burks and Huy (2009) develop a theory that a leader's emotional aperture will affect a team's emotional response and the article contains two photos one with a smiling leader and clear images of a team in the background and the same photo with the smiling leader, but with the background involving the team blurred, to illustrate this. Tsoukas (2009) is also not an empirical paper, but provides a theory about a dialogical approach to new knowledge creation in organizations. It has a diagram depicting that approach.

There are also a number of other papers that use visual images to represent ideas. Katz and Te'eni (2007) reproduce visual slides involved in their research. Adair and Brett (2005) is interesting because although it is not a visual study – using neither visual methods of data collection or analysis – a form of temporal bracketing is used to show changes in relationships over time after the analysis has been conducted using other means. This raises the question of whether articles where there are visuals, but which are not visual methods studies, are actually using visuals at a later stage of the research process of representation, dissemination and reporting. The same observation can be made of the Hinds and Mortensen (2005) study. Similarly, Vera and Crossan (2005) show the relationship between improvisation and other variables that have been calculated statistically, in simple diagrams. Barry and Rerup (2006) contains a lot of different visuals. Bechky (2006) includes a diagram in the article showing the relationships between roles on film sets from an ethnography that provided the empirical evidence. Yoo, Boland Jr. and Lyytinen (2006) use a range of visual aids to represent different organizational structures from one architectural agency. Tschang (2007) uses diagrams to show the impact of creativity on product innovation. Salvato's (2009) article included a visual image of the innovation process. Sidhu, Commandeur and Volberda (2007) used graphs to represent statistical relationships. Plambeck and Weber (2009) also use diagrams to show relationships between different variables. Rothaermel and Alexandre (2009) include computer-generated three dimensional figures to provide a visual image of statistical relationships.

Some authors' articles either had a focus where some important dimensions were visual. For example, Wijnberg and Gemser (2000) illustrate their argument about methods of selection with illustrations from the visual arts industry in general and the impressionists in particular. Baum and Dahlin (2007) discuss flaws in wheels that may be detected by visual inspection are an important consideration, but these are not explored using visual techniques. Wasserman (2008) makes reference to face-to-face meetings as best for exchanging knowledge because they permit the picking up on visual cues, etc. , although visual methods are not used in the remainder of the analysis.

The exact opposite issue to visual cues providing a distraction, but instead helping, is suggested by Cramton (2001), Hinds and Bailey (2003) and Hinds and Mortensen (2005), while Kock (2004) reports on a range of media, some of which would have the qualities of more natural interaction.

Weiss (2000) is also not a visual methods article in any sense; its only use of the term visual comes in an article that is reviewed where it asks the rhetorical question of: "In what way can words be matched against visual images, sounds, and the like?" Other studies in which the term visual appears, but are not visual in any sense are: Gibson (2003); Hinds and Bailey (2003); Kock (2004); Adair and Brett (2005); Hinds and Mortensen (2005); Romanelli and

Khessina (2005); Vera and Crossan (2005); Kellogg, Orlikowski and Yates (2006); and Sonenshein (2009).

2010-2018

There were a number of studies where visual methods were a conscious, substantive part of the research. Bailey *et al.* 's (2010) fieldwork study involved shadowing – and the collection of a number of visual documents – of structural and hardware engineers to understand different ways in which they dealt with gaps in the capability of machines used in a process. Mannucci's (2017) research involved a strong visual component as people were asked to watch and rank animated films, although the analysis carried out was statistical, exploring the relationship between those rankings to variables such as size of budget or whether the film is a sequel for statistical analysis. In Bailey and Barley's (2011) case study, visual methods are used extensively as shadowing and different types of visual documents are the main sources of evidence. Also, the learning episodes are used as the unit of analysis – and these are what were observed – and diagrams of who were involved in those learning episodes appear in the text, even if the main form of analysis is of text, using AtlasTi. Kaplan (2011) conducted an ethnography of how Powerpoint contributes to strategy in an organization and the information is analysed using grounded theory, although the Powerpoint slides are also analysed using AtlasTi. Zilber (2011) used observations of interactions and performances in a physical context – in addition to other methods of collecting evidence – and then analysed visual interactions along with linguistic elements using semiotic analysis. Hence, the visual interactions were seen as signs from which meaning may be derived. Wasserman and Frankel (2011) provide a case study of movement to a new building. A DVD produced for staff moving into the building and observations of use of the building are part of the evidence collection. They also report on analysis which involves looking at all data hermeneutically, looking for patterns. Austin, Devin & Sullivan's (2012) case study utilise observations, artefacts and videotaping of interviews in the evidence collection stage and all of the different forms of information are read together in the analysis stage, although there is not a clear terminology given to explain how it is done. Bailey, Leonardi and Barley (2012) used observation techniques that included seeing physical products, tests of those products and simulations that all involved a visual dimension. Groleau *et al.* (2012) used observation techniques extensively in their case study. Leonardi, Neeley and Gerber's (2012) study relies wholly on observation for evidence collection, but observations are translated immediately into textual data that is then analysed using AtlasTi. Schultz and Hernes (2013) utilize participant-observation in a case study of memory and identity at an organization. There is quite extensive documentation of the observations. Beck and Plowman's (2014) case study used observation in the data collection and a timeline of events in the analysis. De Vaujany and Vaast's (2014) research uses a lot of visual sources including participant observation, photographs of different types and artefacts from an audio-visual institute in its evidence collection. It analyses these using a timeline and representations of how space use is different from that conceived and how it changes over time. Gal, Blegind Jensen and Lyytinen (2014) conduct case studies of the use of artefacts in inter-organizational collaboration and collects those artefacts and observes people at work in those collaborations. , although no form of visual analysis is reported. Seidel and O'Mahony (2014) use both visual methods of evidence collection and an ad hoc method for analysing visual data. Tuertscher, Garud and

Kumaraswamy (2014) use visual methods extensively for collecting and analysing evidence collection. This is also the case in Barley (2015). Beane and Orlikowski's (2015) study includes the use of visual methods of evidence collection and analysis of visual images using conventional method where the visual appear to be another form of symbol. Patriotta and Gruber's (2015) case study include observations and shadowing of news journalists to explore management of unexpected events in news reporting and these observations were analysed through conventional forms such as grounded theory. Bertels, Howard-Grenville and Pek's (2016) case study uses observation and participant-observation but articulate what appear as quite conventional methods of analysis that could also capture visual data. Cohendet and Simon's (2016) research used observation and participant-observation in addition to analysing evidence using visual mapping. Schakel, van Fenema and Faraj's (2016) study examines changes to operational functioning in the fast-moving incident of a fatal shooting of a suspect. These researchers had access to police films of the incident, although they used computer packages to code and analyse text. Sele and Grand's (2016) case study uses participant-observation as an important part of the evidence collection and the analysis involved visual mapping of the routines that were observed. Sonenshein (2016) also uses participant observation and although there is not a specific method of analysis used for analysing visual data, there are references to how ideas were developed by moving iteratively between the data and theoretical ideas. Oliveira and Lumineau (2017) provides a study of seven cases of coordination in building projects, in which visual timelines are part of the collection of evidence and different forms of mapping exercise are used as part of a sociometric technique in its analysis. They also use some useful visuals in their article. Biscaro and Comacchio (2018) collect a considerable amount of visual information including different images and observations. They also used images in the interviews that they conducted. They report that they analysed pictures, but they do not really explain how. Waisberg and Nelson (2018) provides another really interesting case in which observations and participation are used to collect evidence collection, but it is not wholly clear from the description how evidence collected through visual methods were translated in the analysis, although they do discuss creation of templates for each stage in the research process and the use of tracking procedures, so these clearly implied contours and divisions that could be constructed visually.

There were also a number of studies where visual dimensions were a subordinate part of qualitative or mixed methods studies. Etzioni and Ferraro's (2010) research includes participant-observation in the collection of evidence, although this is only a minor part of the evidence collected with textual information that is analysed using codes derived from discourse analysis techniques. Ansari and Phillips (2011) provide a case study that used observations amongst other methods of data collection and a timeline of change as part of its analysis. Vaara and Tienari (2011) utilised participant-observation as part of a case study to collect additional relevant information about sense-making and to validate information collected through other means. Dodgson, Gann and Phillips (2013) used visual inspection of the technology in IBM's development of virtual reality as a limited part of its evidence collection. Aoki and Wilhelm (2017) use observations at plant visits as part of their evidence collection strategy, although there is not a clear explanation of how this visual information is analysed. Marino *et al.* (2015) contains a mixed methods approach, so although quantitative measurements of performance in formula one racing figure prominently, the archival methods used includes many that have visual dimensions including videos. The analysis also appears

to have included a map of events. Quintane and Carnabuci (2016) study a brokerage firm and their main source of data involves regression analysis of email exchanges, but this research was preceded by one of the authors working at the firm where contextual knowledge was built up through observations and interviews. Cornelissen (2012) gathered evidence using interviews. Metaphors were used for the analysis of these interviews, but one of the categories that came out of the metaphoric analysis was one that portrayed visual dimensions, so the visual was a peripheral part of the analysis.

There were a number of articles where visual studies were a subordinate part of quantitative research. Lee (2010) used a computerized algorithm to generate evidence, to link patents to inventors, but the complexity of details of inventors meant that there was the need for some "visual inspection" to remedy problems in the links. Faraj and Johnson (2011) analysed a large volume of interactions using exponential random graph models that provided graphics of the interactions. Elfenbein and Zenger (2017) is another study reliant on algorithms but visual inspection was used to check spellings in the construction of the database. Bartel, Wrzesniewski and Wiesenfeld (2012) administered a web-based questionnaire which was analysed using statistical techniques, but one of the questions in the questionnaire includes a Venn diagram. Turner, Mitchell and Bettis's (2010) research involves a statistical analysis of quantitative data from different databases, but visual analysis of trajectories was used to decide whether or not to include certain years of data in the analysis. Pentland, Hærem and Hillison (2011) use a range of different visualization forms of inspection of sequences, clusters and networks in its analysis of a large database of invoices. Lomi *et al.* (2014) collect quantitative data through questionnaires and adopt a technique for providing a visual representation of distance in a network. Ramarajan, Berger and Greenspan (2017) conducts four empirical studies to identify issues around conflicting identities in one of the four studies, a visual method of overlapping circles is used in the analysis to identify different configurations of identities. Ferraro and Beunza (2018/forthcoming) uses visual mapping to analyse incidents of stakeholder dialogue. Brands, Menges and Kilduff (2015) employ questionnaires and statistical analysis of relationships, but one of the questions into issues of gender and leadership, involve the use of a visual representations of the extent to which a leader and the respondent completing the questionnaire are central. Lee (2013) utilised statistical techniques to analyse evidence about mergers and acquisitions from a database, but also involved "visual examination of residuals indicated possible heteroscedasticity" (p. 1247). Elfenbein and Zenger (2014) analysed information in a database statistically, but found the need for a visual inspection of information in databases to ensure that names of suppliers were spelt consistently before the analysis of relationships. Although Obloj and Zenger's (2017) main method of analysis is statistical, they do use a scatter graph for visual comparisons.

There were a number of articles that were not empirical – i.e. , they were either conceptual or theoretical – so they did not use any research methods, but they did use visual aids to explain their argument and could, thus be considered visual. This is the case with Fang, Lee and Schilling (2010). Millhiser, Coen and Solow (2011) is also a conceptual paper that contains diagrams showing the impact of different policies. Senior, Lee and Butler (2011) is also a conceptual paper on how organizational cognitive neuroscience involves visual cues and it provides a visual overview of the methods that might be used, although the explanation of the visual does not appear in that diagram. Another conceptual article that used visuals is by

Bothner, Kim and Smith who used simulation to investigate and illustrate the change in status of a golfer and a driver and the impact of status on their respective performance. Gavetti and Warglien (2015) is also a conceptual paper with some simulations and a considerable number of diagrams. Fremeth, Holburn and Richter (2016) is similar because it aims to outline a synthetic control methodology which would involve the generation of graphs for visual examination and when illustrating the approach, it generates numerous graphs. Gary *et al.* (2017) is also a conceptual paper, supported by experiments and it contains a number of figures.

A number of non-empirical/ conceptual articles did not use visual aids – other than standard tables – to explain argument were also found through the search of "visual". Behfar and Okhuysen (2018) is an interesting example because it is a so-called 'Perspectives' piece on abductive logic, but includes using visually sensory experiences to develop logic and concept mapping as a visual technique to enhance people's understanding.

There were a number of articles that were not visual studies, but they did contain visual representations. Graffin and Ward (2010) makes reference to performance of baseball players that has a visual dimension and it contains one graph that is based on prior statistical calculations. Petkova, Rindova and Gupta (2013) show relationships between variables and expressions of the associated statistics in a visual figure. Sosa, Gargiulo and Rowles (2015) makes extensive use of figures in its presentation of its findings. Piazza and Perretti (2015) also utilise a number of figures illustrating relationships visually in the article. Jancsary *et al.* (2017) use a number of figures to represent their main ideas. Jang (2017) contains five figures from which one can get the gist of the content of the article. Clark, Kuppuswamy and Staats (2018) use a number of figurative illustrations. Steigenberger and Wilhelm (2018) have a figure to explain their model and the relationship between its hypotheses. Baker and Bulkley (2014) show relationships between ideas in diagrams. Orlikowski and Scott (2014) collect data from AA and Trip Advisor websites and they have a figure that shows a screenshot from an AA website, but they do not indicate that they used visual methods of evidence collection or analysis.

Many of the studies that used visual methods included visual elements when reporting their work, including: Faraj and Johnson's (2011), who had graphics of interactions studied; Wasserman and Frankel (2011), who included photographs relating to the building in their case study; Bailey, Leonardi and Barley (2012), who included photos, graphs and other relevant images; de Vaujany and Vaast (2014) who include a range of different types of visual resources. Tuertscher, Garud and Kumaraswamy (2014) utilise visuals in the presentation of the research; Barley (2015) also contains visual images; Beane and Orlikowski (2015) includes visual image; Patriotta and Gruber (2015) also contains a good number of helpful diagrams; Schakel, van Fenema and Faraj (2016) includes useful graphics in the text to illustrate the fast-moving incident involved in their research; Sele and Grand (2016) produce diagrammatic images of the different routines their research observed; Oliveira and Lumineau (2017) also has some useful visuals; Biscaro and Comacchio (2018) include a number of relevant images; Waisberg and Nelson (2018) have a number of interesting diagrams and pictures; Lomi *et al.* (2014) include diagrams of networks; Ferraro and Beunza (2018/forthcoming) include a number of highly illustrative diagrams;

There were studies that had a visual focus, but visual methods were either not used, or not explained. Rindova, Dalpiaz and Ravasi (2011) is a study that focuses on a company that makes metal art, but these are not demonstrated through visual means. Cattani, Dunbar and Shapira's (2013) empirical focus includes stringed instruments that had a strong visual dimension, but visual methods are not used. Godart, Shipilov and Claes's (2014) empirical focus is creativity in fashion houses but there is no use of visual methods. Sgourev's research (2013) is about acceptance of a new genre of art but explanation of any visual dimensions of the research methods are not explained extensively. There was also one article that drew attention to the importance of the visual without using visual aids. That was by Fayard and Metiu (2014) who discussed a study of collaborations without visual contact, but who makes the point about how knowledge of collaboration through letters and similar correspondence can add to understanding of when visual interactions may take place in the course of collaborations.

There were also a number of articles during this period that, while using the term visual, did not engage with visual dimensions in any way, other than carrying standard tables. These included: Kirsch, Ko and Haney (2010); Cameron and Webster (2011); Feldman and Orlikowski (2011); Gibson *et al.* (2011); Howard-Grenville *et al.* (2011); McKay *et al.* (2011); Weber and Dacin (2011); Waguespack and Sorensen (2011); Boudreau (2012); Adams, Fontana and Malerba (2016); Hohnisch *et al.* (2016); Szulanski, Ringov and Jensen (2016); Gartenberg and Wulf (2017); Hoogendoorn, Parker and van Praag (2017); Durand and Georgallis (2018); and Liu *et al.* (2018/forthcoming).

Organization Studies

1990-1999

Interestingly, although there are 20 references to the word 'visual' (or adaptations of this expression) in articles published in Organization Studies in the 1990-1999 period, none of these refer to visual studies or the use visual imagery in the articles' analysis. Sometimes, the word is merely mentioned in passing (e.g., Angus, 1993; Bloor and Dawson, 1994, Child and Lu, 1990; Hambrick et al., 1998; Reed, 1997; Vince and Broussine, 1996; Wolfram Cox, 1997). Other articles use the word contextually (albeit not necessarily very often), in relation to one or more of the main themes or concepts of a study (e.g. when discussing the use of self-image in management studies – cf. Tsoukas and Cummings, 1997; the role of stories, fantasies and subjectivity in the [un]manageability of organizations – cf. Gabriel, 1995; the relation between interpretation and representation in organizational analysis – cf. Jeffcutt, 1994). Some of the articles (e.g., Butler, 1997; Child and Lu, 1990; Hambrick et al., 1998; Ulf and Johanssen, 1997; Sobrero and Schroeder, 1998; Üsdiken and Pasadeos, 1995) contain diagrams or graphical depictions (of, for instance, the political nature of decision-making processes, the influence of someone's nationality on in-group behaviour; the application of case stories or experimentation in social inquiry, or co-citation networks). Such diagrams typically either offer an overview of the analyses the authors conduct; the theoretical framing(s) they apply; and/or of the article's main results. Most frequently, however, the expression is used to describe and discuss the outcomes of statistical analyses the authors conduct (e.g., Barkema and Pennings, 1998; Drory, 1993; Preisendörfer and Voss, 1990; Weisberg, 1990). Whenever this happens, the authors refer to the fact that they resorted to the visual inspection of their data or of graphs to draw or sustain particular conclusions.

By and large, however, it seems that the use of 'the visual' (in the widest possible sense) is fairly limited in the 1990-1990 period in the journal, despite the wide variety in theoretical frames used by the authors. Sandelands (1993) does call for more visually tinged studies of organizations and organizational life (and the use of visual maps in particular), but as we shall see, this view did not receive much follow-up in the journal until approximately 15 years later ... although there are some notable exceptions.

2000-2009

This particular era saw a sharp increase in the number of articles containing (adaptations of) the word 'visual'. The number rose from 20, between 1990-1999, to 73 between 2000-2009. The first article that actually labels itself as a visual study is also published in this particular decade, in 2007 (Hindmarsh and Pilnick, 2007). However, there are several earlier articles that may be labelled as such as well, although the authors did not indicate this.

The 20th volume of Organization Studies was published in the year 2000. To celebrate the occasion, a special "edition 0" of the journal was published, edited by one of the journal's former editors-in-chief, Arndt Sorge. Apart from a picture of a sleeping former editor, which probably has been added as a joke, the "edition 0" contains two articles that show extensive visual imagery, attempting to support the relevance of 'the visual' in organization studies. Both articles are personal accounts, written in the "I" form, in which the authors lament the lack of visually based organization studies and reflect on some of the difficulties involved in getting them published.

Strati (2000) puts forward the view that the study of organizational life may be approached aesthetically, and could hence involve conceptual art photography. He asserts that greater tolerance for this position would allow him to combine his sociological (and professional) background with one of his passions: arts photography. Strati describes how he sometimes searches the Internet to look for pictures … and how he might use these in his sociological research. The article aims to generate sympathy among Organization Studies' readers for an empathic-aesthetic understanding of interaction in organizational contexts. The other special issue article, by de Monthoux (2000), is more conceptual and philosophical in nature, and contains eleven drawings that the author commissioned three well-known performance artists (whom he calls 'managers') to prepare for the article. Based on specific insights from the work of Arthur Schopenhauer, de Monthoux claims that pictures, texts and other artefacts can be interpreted as spin-offs of an artist's main function: to perform the absolute. This article illustrates this particular philosophical position and exemplifies the value that may be created through drawings as the author tries to express his views in a way that transcends text (since the absolute needs to transcend text).

In 2002, three articles were published that do not call themselves visual studies, and also do not refer to the aforementioned studies, but which may count as (reflections on) such studies nevertheless. Daniels, Johnson and de Chernatony (2002) apply insights from institutional theory to managers' cognition of competition, and derive a series of competing propositions whose importance they rank using a sample of 32 managers from the UK personal financial services industry. The authors resort to two cognitive mapping methods when doing so. The elicitation of cognitive maps is facilitated through their visualization via cards (the authors call this approach 'visual card sorting'). A visual image of competitors in the financial services industry is created by the selected managers, using cards with company names the authors have prepared. Their explanations of the image they make form the input for a series of statistical analyses that are conducted subsequently, in order to test specific hypotheses.

The authors conclude their analysis by underlining the usefulness of distinguishing between task and institutional environments in management cognition and strategic management research. However, it is unclear how the stories managers provided got to be translated into numbers precisely. It is only stated that this has been done, and a few example questions that participants were asked in the process are listed. Partially therefore, the article is criticized by Hodgkinson (2002), who also doubts the objectivity of the authors' analysis. He does not use the expression 'visual card sorting' at all (in fact, the expression 'visual' is not featured in his contribution), but calls the method Daniel, Johnson and de Chernatony (2002) apply 'card sorting'. Daniels and Johnson (2002) provide a rejoinder to Hodgkinson (2002), in which they say that given the type of research questions asked, their research methods were appropriate and their conclusions valid. One of the aforementioned authors was also involved in the Balogun and Johnson (2005) study, in which a real-time analysis of a planned change implementation initiative is conducted to understand the tendency for intended strategies to lead to unintended consequences. Informal processes of sensemaking seem to result in both intended and unintended change outcomes, and thereby contribute to the unpredictable, emergent nature of strategic change. A 'visual mapping strategy' (cf. Langley, 1999) is used to map perceived interactions among participants in the change initiative. The subsequent analysis is based on (excerpts from) narratives. However, the authors do not transform the narratives into numbers.

As stated, Hindmarsh and Pilnick (2007) is the first article published in Organization Studies that explicitly says it is a visual study. Their ethnomethodological study combines conversation and video analysis methods. Hindmarsh and Pilnick examine the nature of 'embodiment' in the workplace. They analyse the real-time coordination involved in teamwork in preoperative anaesthesia to propose a new approach for examining the role of the body in concrete organizational settings. The authors indicate how both verbal and non-verbal interactions between medical personnel intermingle as knowledge gets to be exchanged and coordinated for particular operations to proceed in specific ways. Another visual study was published the same year by Meisiek and Barry (2007). In their longitudinal study, video analysis methods are part of a much larger palette of research methods. The authors base their approach on Langley (1999). Using insights from the organizational theatre literature, interview, visual, and survey methods are combined to assess the processes underlying an organizational theatre effort undertaken by employees of a particular home care organization. It is examined how theatre performances affect organizational members' understanding of their workplace. All 3,000 employees of the organization, who were arranged in 30 groups of 100 people, were asked to watch and, if they wished, participate in the performance of a play during the course of one year. The authors conclude that current explanations of analogical processes (between theatre and organizational life) may be too restrictive, given what they have witnessed in the organization in question.

A final visual study published in the 1999-2009 period stems from Ewenstein and Whyte (2009). They use photographs, documents, maps and sketches, examples of which are reproduced throughout the article, to draw attention to the multidimensional nature of 'objects'. Knowledge work, undertaken by architects, around a variety of visual representations that are produced during the design of a particular building at Kew Gardens is exemplified as the authors investigate a variety of architectural practices in the firm that was commissioned to put the building in place. The visual data, which are emphasized throughout the article, are part of a larger set of information sources that also includes observation and interview data. Perhaps somewhat surprisingly, the authors claim that they conduct a grounded theory study.

As reproduction costs diminished due to technological advances, it gradually became easier to include visual materials in academic journals. The 2000s therefore also saw a gradual rise in visual representations in Organization Studies (which progressed the following decade), ranging from pictures of particular organizational settings to sometimes quite intricate depictions of analysis methods and/or theoretical framings. However, this did not happen in the context of visual studies primarily or only. Apart from the Ewenstein and Whyte (2009) study mentioned above, examples include the Munhir and Phillips (2005) and Warren (2008) articles. Munhir and Phillips (2005) apply discourse analysis methods in their exploration of the role of institutional entrepreneurs in processes of institutional change coinciding with the adoption of new technologies by Kodak. The authors put the view that such adoptions get to be reflected in the adverts companies use. They specifically analyse how the advent of new technology has affected the position(ing) of the "Kodak Girl" in four adverts, which are included in the article. Warren (2008), just like Sandelands (1993) 15 years earlier, calls for more visually tinged organizational studies, although she does note, in passing, that interest in visual research in management studies has grown in recent years. Among others, she cites Strati (2000) when addressing the lack of literature engaging with the methodological challenges of aesthetics research. Warren promotes the use of what she calls 'sensual methodologies' to expand and strengthen this literature, in which visual research methods and data may play a significant role. The article includes several pictures that aim to represent the aestheticisation of a web-design department of a UK-based IT-firm.

The 2000s also saw a rise in case study articles in the journal, in which observation is frequently listed as one of the main information sources informing the empirical analysis (e.g., see Ainsworth and Wolfram Cox, 2003; Bonazzi and Antonelli, 2003; Ewenstein and Whyte, 2009; Iedema et al., 2004; Munhir and Phillips, 2005; Shattuck and Miller, 2006). One could argue that these articles, in one way or another, contain and make use of, visual data. Although it is usually stated where and when these observations were done, and it is also occasionally described what exactly was observed, there is relatively little information on how the observations were recorded, and how precisely they found their way into the analysis that was carried out thereafter, apart from the fact that they ostensibly helped to sustain or add greater depth to particular conclusions or insights.

In this particular decade, it is again striking how wide-ranging the theoretical viewpoints adhered to by the authors in the journal are. The fact that two new sections were added to the journal in this period ("Essai" and "Peripheral Vision"), in which authors are encouraged to reflect on the possible use of hitherto little used authors, concepts and/or philosophies in organization studies, may have contributed to the clearly broad range of viewpoints addressed (see also Tsoukas, 2008).

2010-2018

According to Bell and Davison (2013), this particular decade is the period in which a 'visual turn' in management studies manifested itself. How far this turn can be seen in Organization Studies may be a question of debate, however. Before the end of 2013, only two more visual studies were published in the journal. Although especially due to a special issue in 2018 (five articles), and several other (five) articles that were published during that particular year, a substantial increase in visual studies can be witnessed in this decade, the total number of visual studies in the journal is pretty low overall (see our summary table for details). A total of 14 visual studies is found between 2010-2018, whereas this number was 0 between 1990-1999, and 7 between 2000-2009. The number of articles containing the word 'visual'

increased more radically, from 20 (between 1990-1999), to 73 (between 2000-2009), to 139 (between 2010-2018). Just like in the previous decade, many examples of articles containing visual data can be found (e.g., see Arnould and Cayla, 2015; Basque and Langley, 2018; Cailleut, Gorge and Özçağlar-Toulouse, 2018; Giovanni and Quattrone, 2018; Hirst and Humphreys, 2013; Islam, Endrissat, Noppeney, 2016; Sørensen, 2014; Stevens, 2017; Thompson, 2018).The same holds for case studies that include observation as an important information source; their number is also quite impressive (e.g., see Austin, Hjorth and Hessel, 2018; Baralou and Tsoukas, 2015; Buenza and Ferraro, 2018; Gist-Mackey, 2018; Gkeredakis, 2014; Russell and McCabe, 2015; Qureshi, Sutter and Bhatt, 2018). However, how exactly the observations that were done informed the subsequent analyses, again remains somewhat vague. What is also striking in this particular period is the increase in conceptual and theoretical contributions. Especially during the reign of editors-in-chief Frank den Hoed and Robin Holt, between 2013-2017, articles of this type seemed to proliferate.

Iedema and Rhodes (2010) is the first visual study in the decade at hand. The article tries to understand how a video-based intervention in a hospital led to different behaviours among clinicians. The analysis focuses on a video ethnography of work behaviours, on which participants are invited to reflect. The article mainly looks at these reflections. The authors' contribution is to demonstrate how specific interactions can result from video 'surveillance'. Apart for video fragments, interviews are used to elicit responses from the clinicians in the case organization.

Connellan (2013), drawing upon Foucault's theories of power and aesthetics, examines how people can get caught up in the institutionalization of spaces through the use of the colour white. The article uses a total of 14 pictures of the interior of a church, parliament building, prison, university and hospital to exemplify how 'whiteness' can affect the psyche. These photographs, which the author made herself in the course of a funded research project, are the sole empirical materials in the article. They are chiefly used to come up with and substantiate a particular conceptual contribution, relating 'whiteness' to the human psyche. Hence, we would be inclined to view this study as a borderline case of a visual study. articleStevens (2017) is another article that only uses photographs made by the author, but this article is explicitly framed as an essay (that is part of an essay competition) which tries to read public space, and find out on the basis of which theoretical framework(s) homelessness might be discussed. Stevens' photographs are meant as illustrations since the author's aim is not to necessarily (re)conceptualize something. Hence, we find it difficult to treat this article as a visual study, although it clearly does contain visual data.

Llewellyn (2015) analyses how organizational members draw upon conscious and subconscious assumptions about age as they engage in organizational activities. She presents an ethnomethodological study that uses conversation analysis and video-recordings of naturally occurring interactions between visitors and personnel at the reception desk of a museum. Llewellyn's article explores how customers may be viewed with respect to age-based norms, given the visual assessment of their appearance by museum personnel.

In the same year, Wasserman and Frenkel (2015) explored the relations between organizational space, gender, and class. The authors analyse the Israeli Ministry of Foreign Affairs' new headquarters, and show how space is enacted by women with different social backgrounds in accordance with their habitus. The authors do not call theirs a visual study, and it may be argued that visual methods play only a limited role in the analysis (given the 'methodological process' the authors put forward in Table 1 of their article), but they do state in their research methods section that their empirical material is partially based on 20 on-site observations, in which movement patterns, bodily gestures and interactions of and between

female employees of the aforementioned Ministry have been studied, which must have informed their subsequent conceptualization of interactions. This is another example of a article in which it is not very clear how observations found their way into the analysis. In the appendix of the article, three pictures of three different desks in the Ministry are shown to highlight differences between groups of female employees singled out by the authors.

A visual study which does not seem to have been published yet, although a publication date of 2017 is listed on the Organization Studies website (the article does not appear in the issue that is mentioned), is Cutcher, Dale and Tyler (2017). The authors consider the politics of how organizations remember their past through commemorative settings and artefacts. Commemoration often occurs through paintings, photos, structures, etc. This article contains eight figures with various pieces of art that the authors use to explicate their views. Again, this is largely a conceptual article, but the authors do call their work a visual study.

As mentioned earlier, in 2018, a special issue on visual research was published in Organization Studies. The special issue (title) talks about a 'visual turn' in organization studies, as well as about an apparent 'material turn', of which the contours are slowly becoming evident in the literature (Boxenbaum et al., 2018). Although Boxembaum et al. argue that all eight special issue articles focus on visual methodologies (including discourse analysis), it may be asserted that there are only five visual studies among them. Other studies either only partially focus on visual data, for instance to understand how *emojis* are used by managers to incarnate specific messages (Arjaliès and Bansal, 2018), or they focus on discourses in which visuals may or may not play a role (Höllerer, Janscsary and Grafström, 2018), or rather emphasize the 'material turn' in organization studies (Raaijmakers, Vermeulen en Meeus, 2018). Puyou and Quattrone (2018), spanning a period from Roman times to the current day, investigate how visual and material dimensions of accounts help social actors to explore their positions and ties within particular communities. Stowell and Warren (2018) employ visual methods (photo-interviewing techniques) to capture e-waste recycling workers' perspectives on how they uphold specific safety laws in their daily work. Drawing on auto-ethnographic, visual data, it is shown how the authors developed a strategy of empathizing with their field research participants. Stigliani and Ravasi (2018) present the outcomes of a ten-month ethnographic study in a design consultancy company. Their article describes various ways in which members of a design team verbally articulated their aesthetic knowledge (knowing that this can only be done imperfectly) in order to enable and sustain creative collaborations. Christiansen (2018) examines the visual framing of alcohol-related harm in the campaign materials of a particular European spirits producer, using 52 adverts from the 2007-2013 period. Halgin, Glynn and Rockwell (2018) present a statistical analysis of cover images used by the *Business Week* magazine that intend to portray specific organizations. This is done for the 1978-2007 period. It is suggested that the depiction of organizational actorhood increased during that period and that such actorhood especially got to be emphasized when organizations faced heightened paradoxical tensions in their business environment.

Apart from the aforementioned special issue, Organization Studies published five other visual studies in 2018. Interestingly, three of these articles were published in another special issue on organizational creativity and entrepreneurship. On top of this, a pure conceptual article on visual research was published as well. Hassard *et al.* (2018) suggest that by engaging in interpretive and reflexive thinking, innovative theoretical perspectives and new methodological proposals for film- and video-based research may be derived.

Nash (2018) addresses the symbolic and material significance of 'place' in understanding people's experiences of power relations within organizational life. This is explored as the author walks through the City of London, takes pictures, and interviews people who she meets and/or talks to. The article's methodological approach is based on Lefebvre's (2004) work on rhythm analysis.

Elias *et al.* (2018) present a micro-ethnographic study of arts entrepreneurs to illustrate the role customers typically play in creative processes. It is highlighted how aesthetic value emerges from interactions and collaborations between artists and their customers, and how this value is effectively co-created. The data analysis contains information from many sources, ranging from observation to interviews, field notes to visual data. The authors videotaped many of their interviews, as well as examples of artists at work during their 11-month study. Besides, photographs from secondary sources are included in the analysis.

A somewhat unusual, but very innovative, article by Eghenter (2018) has been written up as a play. It is a conversation subdivided into acts, which contains multiple photographs and drawings that partially stem from museum collections. Eghenter purports that she cannot explain the nature of an object through words alone, since it is visual. She tries to reason about the process in which this transformation is accomplished instead. An 'organizational analogue' is thus conceived as a work of art.

The interplay between play and work in, what the authors claim, has become a largely aestheticized working life for many organizational members, is assessed by Alexandersson and Kalonaityte (2018). Their empirical analysis focuses on 100 images of the interior design of 20 offices, which were available on the Internet when data were collected in the first half of 2005. Drawing from the works of Jacques Rancière, the authors add to his theorizations about the subordination of employee imagination and the desire for heteronomy and autonomy that organizational members may have at the same time, which may induce a change in social order.

Comi and Whyte (2018), which may be regarded as a follow-up of the Ewenstein and Whyte (2009) study discussed above, contains an ethnographic study of a design project at Kew Gardens. The authors examine how visual artefacts were built and used in creating realizable courses of action by an architectural studio that was commissioned to come up with a development strategy by one of its clients. These artefacts, which range from maps to prototypes to rough sketches, are the main focus of the article. It is shown how various visual artefacts are immersed in practices of imagining, testing, stabilizing and reifying, in conjunction with the client, and therefore had a performative function in the creation of a particular organizational future.

Gabriel (2010) argues that Organization Studies is embedded in a complex network of institutions and practices over which the journal's editorial team typically has very little control. Among these are the conventions of peer review, the worldwide growth of publication outlets, and attempts (of other journals) to improve rankings and citations, in which Organization Studies has to participate as well. Therefore, he claims, the journal can and will not publish anything it wishes, and may in some respects decide not to be a frontrunner, as it wants to reach 'the masses' to retain its citation rate and rankings, and remain commercially viable. The latter became a focal point for the journal in the early 2000s (Tsoukas, 2008), and very much got to be emphasized in the 2008-2013 period (Courpasson, 2013). Perhaps partially therefore, it may not be that much of a surprise that the journal saw

relatively few visual studies before the 'visual turn' was signalled by other authors in other journals (Bell and Davison, 2013).

The visual articles that have been published to date in the journal mainly seem to focus on aesthetics, the (re)design of objects, analogues between visual and non-visual 'worlds', sensemaking efforts by particular social actors, and mapping and sorting techniques that require the interpretation of visual imagery. Often, these studies are of the ethnomethodological kind, with a popular reference being Langley (1999).