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Abstract

This paper explores ‘research-as-craft’ as a sensitising concept for disclosing the presence of ethics and politics, as well as embodiment and imagination, in the doing and representation of scientific activity. Routinely unnoticed, marginalized or suppressed in methodology sections of articles and methodology textbooks, research-as-craft gestures towards messy, tacit, uncertain, yet rarely thematized, practices that are central to getting science done. To acknowledge and address the significance of research-as-craft in knowledge production, we show how it relates to three forms of reflexivity – constitutive, epistemic and disruptive. Through this we demonstrate the craftiness that is required when struggling with the indeterminacy that is endemic to the production and communication of scientific knowledge. By showing how empirical situations require imaginative interpretation by embodied researchers, we argue that our conception of research-as-craft facilitates appreciation of scientific inquiry as an indexical activity that involves the crafted object and the researcher in an ethico-political process of co-constituting knowledge.

‘Craft’ is used figuratively and as a synonym, to characterise the process of generating and disseminating social and natural scientific knowledge (Booth, Colomb and Williams, 2016; Vagle, 2016; Beuving and de Vries, 2015; Kvale and Brinkmann, 2009; Bernard, 2006; Prasad, 2005). Bernard (2006) declares that ‘[r]esearch is a craft. I’m not talking *analogy* here. Research isn’t *like* a craft. It *is* a craft’ (Bernard, 2006: 1, emphasis in original). Frequent but rarely elaborated reference is made to ‘craft’ when characterizing aspects of scientific knowledge production, especially in qualitative inquiry (Atkinson, 2013; Liberman, 1999; O’Connor, 2017), including in management and organization studies (c.f. Baer and Shaw, 2017; Patriotta, 2017). Yet there has been little sustained reflection on the significance of craft as a means of advancing self-understanding in scientific work, and thereby informing research practice. To address this anomaly, we commend the notion of research-as-craft to thematise what is opaque, yet signified by ‘craft’ in research practice. We therefore seek to facilitate a more purposive enactment of research-as-craft.

Etymologically, craft is polysemic¹. It speaks to the embodied, imaginative, ethical and political nature of practice. Reference to craft typically evokes dedication to the perfection of practice based on the acquisition of embodied skill over time (Sennett, 2008), a dedication rendered intrinsically problematic by the presumption of perfection (Clarke and Knights, 2018). With regard to scientific practice, attentiveness to research-as-craft is congruent with ‘calls for continued deliberation and innovation – in particular, deliberation over the ontological relation between self (as researcher) and Other (as researched)’ (Rhodes, 2009: 665). Relatedly, craft is invoked to signal scientists’ struggles with *indeterminacy* in the research process (Pinch, 1981; Latour and Woolgar, 1986; Collins and Pinch, 1993) that defy the certainties to which ‘idealized notions of expertise’ aspire but ‘axiomatically are impossible to achieve’ (Clarke and Knights, 2008: 1396). It is the ‘indeterminacy inherent in social action’ (Knorr-Cetina, 1983: 134) in producing and disseminating scientific knowledge

that frustrates the realization of idealized characterizations attributed to openness of judgment as an ideal of scientific practiceⁱⁱ. Craft gestures to what, in the social sciences, Klag and Langley (2013: 163) term ‘the mysterious dimension of qualitative methodology’, a feature they describe as ‘magical’ but which we characterize as ‘crafted’ and ‘crafty’, although we argue here that this term should not be reserved for qualitative research. Its broader relevance is indicated by Pinch (1981) when he observes that ‘[c]raft practices...enable the scientist to get on with the everyday business of *doing* science’ before commenting that because scientific practices ‘rest on tacit knowledge, they are frequently messy, and they cannot be easily generalized outside the local situation’ (p. 151). In short, craft is important for understanding and informing our practices as (social) scientists: it is central to getting science done. But in accounts of research practice, craft(iness) is merely glimpsed and gestured towards, rather than registered or appreciated as scientists – natural and social – may be only dimly aware of the presence and significance of their craft(iness).

In management and organization studies, recognition of craft as central to processes of knowledge production is signalled but unelaborated by Prasad (2005) when she characterizes ‘science in practice’ as ‘an inventive form of *craftsmanship* that is constantly engaged in adjusting and reconfiguring scientific protocols to meet the vagaries of each unique empirical situation’ (p.7, emphasis added). Acknowledgement of the ‘uniqueness’ of context is critical but its features should not be regarded as self-evident. This is because each empirical situation must be interpreted imaginatively, or craftily, by embodied researchers working within communities of practice (Lave and Wenger; 1991; Bourdieu, Chamboredon, Passeron and Kraus, 1991). Since this indexicalⁱⁱⁱ (and reflexive) quality of research practice is generally taken for granted, disregarded or suppressed, researchers are ‘largely left in the dark’ (Van Maanen, Sørensen and Mitchell, 2007: 1149). To thematise the presence of craft in research, and redress its neglected significance, we propose ‘research-as-craft’ as a

sensitizing concept.^{iv} In addition to developing awareness of the embodied (Sudnow and Dreyfus, 2001), imaginative (Weick, 1969) nature of knowledge production, we commend the concept of research-as-craft to strengthen appreciation of its political and ethical formation and effects (Haraway, 1988).

By *ethics* we do not mean a set of ‘rules, virtues or formulas [or protocols] that is used to ensure or judge righteousness’ (Rhodes and Carlsen, 2018: 3). Rather, we commend a conception of ethics-in-practice characterised by complexities in the conduct of research that resist mechanical application of rules (Guillemin and Gillam, 2004; Derrida, 2002). Struggles with such complexities are marked by vulnerability and conditioned by events that escape prediction and control, as ‘one’s own knowledge and self-understanding are themselves [rendered] open to question through the research encounter’ (Rhodes and Carlsen, 2018: 3). Research-as-craft conceives of knowledge producers as embodied beings who struggle imaginatively with ‘the radical contingency [of social objectivity] that mark[s] our inquiries, our lives’ (Bernstein, 1991: 336). Codes or virtues may inform struggles with indeterminacy but, ultimately, an ethical leap is required. Understood in this way, research, as a craft, ‘is always and inextricably fused with the ethics of our relations with the people we study’ (Lieberman, 1999: 55). By *politics*, we mean the mobilization of material and symbolic resources to produce and disseminate knowledge. The production of scientific knowledge is thus understood recursively as embedded in institutional contexts that it actively reproduces and, potentially, transforms.

When indeterminacy is considered, or assumed, to be intrinsic to social worlds, then reflexivity is required to establish and maintain a sense of their stability and continuity – that is, their social objectivity. Reflexivity is constitutive of social worlds, including the worlds in which science is generated and communicated. Whether acknowledged or not, we conceive of research practices as inherently reflexive, involving a measure of craft(iness) in coping

with indeterminacy and thereby evading dislocation and ‘reality disjuncture’ (Pollner, 1987). We begin by thematising the role of craft in knowledge production in relation to three forms of reflexivity – constitutive, epistemic and disruptive. We then argue that the invocation of craft in accounts of research practice points to the significance of indeterminacy and disruptive reflexivity. Next, we address two key aspects of research-as-craft, imagination and embodied knowing, before showing how invocations of craft in accounts of research practice signal the importance of politics and ethics in generating, evaluating and disseminating knowledge. In conclusion, we consider the implications of craft for researchers’ self-understanding and the practice of social scientific inquiry.

Mobilizing reflexivities

In addition to being imaginative and embodied, etymologically, ‘craft’ connects the application of skill to the ethics of self-formation (see note *i*). It encompasses ‘the power to control one’s own pattern of life, its shape and speed, to resist through the process of making and designing’ (Greenhalgh, 2002: 8). This capability, and the responsibilities arising from researchers’ involvement in representing and changing their objects of study, invites consideration of reflexivity in processes of knowledge production. Exemplified by a capacity to become aware of ‘how knowledge changes its own object’ (Smith, 2005: 12; Bourdieu, 2004; Alvesson, Hardy and Harley, 2008), the significance of reflexivity for research resides in the provision of

a guard against... the assumption that there is an unproblematic relationship between us and the world, including social scientific practices and its products, which results in a valid and reliable representation of the world (May and Perry, 2017: 4).

In the absence of reflexivity, research findings, and the assumptions on which they are

based, are treated as quasi-autonomous, fetishized nuggets of knowledge, acquired without regard to their sensuous and socially organized production and application. Such an approach to the production of knowledge (re)produces an objectivistic sense of being ‘*in* the world, not *with* the world’ (Freire, 2005: 75, emphasis in original). The Cartesian separation between subject (researcher) and object (researched) contrives to bestow credibility on knowledge that is declared to be devoid of subjectivity, and therefore neutral and objective (Sandberg and Tsoukas, 2011). Conversely, when this dualism is placed in question by a dialectical understanding of the subject-object relationship, claims to neutrality are reframed as expressions of ideology, not least because those claims are seen to dissemble or mystify the political and ethical conditions and consequences of scientific knowledge production.

To explain the relation of subject and object, we distinguish three forms of reflexivity: constitutive, epistemic and disruptive. The first form, *constitutive* reflexivity, affords a suspension of doubt about the reality of social objectivity. The operation of constitutive reflexivity enables actors to maintain what Giddens (1979: 128) terms ‘the basic security system’ that underpins the (re)production of social realities, including everyday and scientific life-worlds. Constitutive reflexivity is articulated as ‘knowledgeability’ which comprises everything known by actors – tacitly and discursively – about how to ‘carry on’ their activity (Giddens, 1984: 375). It is a ubiquitous condition of the on-going production of social/material order(ing) in its diverse forms. So endemic that it is ‘seen but unnoticed’ (Garfinkel, 1967), constitutive reflexivity ensures a sense of self-evidence or taken-for-grantedness. The ‘knowledgeability’ accomplished by constitutive reflexivity provides an accountable (sense of) lay and scientific orderliness that is, however, inherently vulnerable to disjuncture. Its fragility is demonstrated when lay or scientific routine is breached resulting, *in extremis*, in the collapse or breakdown of the ‘basic security system’ (Giddens, 1979) as manifest, in the scientific realm, in a paradigm shift (Kuhn, 1969). A routine example of

constitutive reflexivity is the identification of a ‘publishable paper’ by reviewers following its submission to a scholarly journal, thereby fixing its (previously undecided) status. This status is nonetheless vulnerable to disjuncture, as when an editor overrides the assessment of reviewers, or when the publishable status of an article is placed in question by allegations of fraud or defamation.

Second, *epistemic* reflexivity is mobilised when testing, and thereby warranting or falsifying, the validity of knowledge claims. Epistemic reflexivity interrogates the plausibility, and ultimately the truth, of manifestations of knowledgeability. Centrally, it warrants claims to objectivity. Epistemic reflexivity is distinguished by its adoption of a God-like position from which ‘a methodological basis for enhancing objectivity’ (Lynch, 2000: 26) is established. This form of reflexivity assumes and promotes a sense of sovereignty by revealing and removing extra-epistemic influences (e.g. biases) in knowledge production (Rouse, 1996). In the context of a pre-modern, medieval worldview, the application of distinctive, scientific epistemic reflexivity challenged established practices which were regarded as an impediment to innovations and progress promised by science. In the modern context, the target of epistemic reflexivity is indeterminacy, manifest as uncertainty or equivocation. It advocates the refinement of ‘technique’ as the means of removing sources of indeterminacy (e.g. bias), thereby warranting objectivity (Bell, Kothiyal and Willmott, 2017). Mastery of technique, whether quantitative or qualitative, is presumed ‘to display a discovered order with a high degree of fidelity and verisimilitude’ (Deetz, 1996: 197). Epistemic reflexivity is engaged by diverse producers of knowledge – from scientific Marxists to evidence-based positivists – when striving to validate their knowledge claims. In management and organization studies, epistemic reflexivity is apparent in what Cornelissen (2017) characterizes as “factor analytic” approaches but is pervasive through variants of neopositivism (Prasad and Prasad 2002; Johnson, Buehring, Cassell and Symon 2006).

To illustrate the limitations of epistemic reflexivity in dealing with the contingencies of research, we use an example from the domain of culinary science. Molecular gastronomy works within ‘the regimes of experimental deduction’ (Roosth, 2013: 8) to pursue a decontextualized science of food preparation that disregards ‘interactions of people with national, familial, and ethnic identities, senses of nostalgia, taste and historicity’ (p.12). In such research contexts ‘the unity of science, craftsmanship and artistic quality’ (Gustavsson, 2004: 11) become fragmented – with the consequence that faith in the superiority of an idealized, monist conception of science drives out ‘every other possibility of revealing’ (Heidegger, 1977: 14; see also Collins, 1999) in a manner that parallels ‘abstracted empiricism’ in the social sciences (Mills, 1959).

Finally, *disruptive* reflexivity amplifies doubt by breaching convention and challenging the basis of knowledge claims. It attends to what knowledge produced according to the principles of epistemic reflexivity ‘is not capable of saying’ (Alvesson and Sköldbberg, 2000: 246). This form of reflexivity thereby challenges applications of epistemic reflexivity where craft(iness) is required, but is confined to the service of refining technique. It points to contingencies, paradoxes and uncertainties in (social) scientific endeavour, and so attends to how claims to objectivity may obfuscate their contingency. This amplifies a central lesson concerning the pervasiveness of constitutive reflexivity: namely, that ‘a necessary feature of action is its partial indeterminacy’ (Nicolini, 2013: 48). Indeterminacy may be obscured but it cannot be removed as everyone is a participant in the ‘reflexive and self-reflexive project of monitoring, sense-making and control’ and we are also ‘caught up in its uncertainty, its incompleteness, its plurality’ (Law, 2004: 2). Disruptive reflexivity recalls the limits of order generated by constitutive and epistemic reflexivity as it ‘reclaim[s] conflicts suppressed in everyday life realities, meaning systems and self conceptions’ (Alvesson and Deetz, 1996: 203), including the symbolic universes of science and its exponents. It is attentive to how

every remedy for dis-order, as sought out by constitutive and epistemic reflexivity, is irredeemably vulnerable to unintended (circumstantial) or deliberate (reflexive) disruption.

Disruptive reflexivity deconstructs the orderly, reductionist objectification of craft(y) practices to 'mere' skill. It also discloses the contingency of the boundaries that define the meaning of constructs, such as craft, as it debunks their apprehension as something external comprising distinctive, observable and measurable elements, rather than viewing this boundary as an unstable outcome of processes of co-production within asymmetrical relations of power. This enables understanding of how, for example, procedures of concept clarification, specification of variables, and testing of propositions, are enacted through normative (ethical and political) practices. It recalls how, in practice, clarity, specificity and testing are products of (normalized) convention, not unforced consensus. Hence a one-sided, undialectical approach limited by epistemic reflexivity can be maintained only by excluding or suppressing what does not comply with, and thereby affirm, the approved procedures of what Hirsch and Levin (1999) term 'validity policing'.

However, because disruptive reflexivity does not succumb to performing a 'god trick' (Lynch, 2000: 26), it may problematize but it cannot invalidate their claims (Anderson and Sharrock, 2015: 6). Rather, it draws attention to inherent impossibility of such ambition. The allure of omniscience to which Anderson and Sharrock (2015) refer is perennial, but consistent application of this form of reflexivity heightens sensitivity to ethico-political conditions and consequences of producing knowledge. This sensitivity is exemplified by Marks (2008) in a social scientific study of how knowledge about stem cells is produced. When attending to the restrictiveness and limits of scientific reflection (see p.243), while acknowledging that her analysis is itself perspectival, she writes:

Although I am committed to helping scientists be more reflexive by giving them a sociologically informed understanding of their knowledge, I do not argue that my

knowledge claims are more *truthful* than theirs. They are instead offered as ways to open-up for examination and change the already-existing, often crystallised, and sometimes problematic forms of public engagement. Thus, the interpretative reflexivity I am advocating is different to Bourdieu's reflexivity thesis, and social scientific understandings are not seen as *truer* than natural scientific or commonsensical ones. (p.236, emphasis in original)

Marks's stance distances the knowledge claims generated by disruptive reflexivity, or what she terms 'interpretive reflexivity', from those generated by epistemic reflexivity which, assumes the possibility of transcending contingency to attain objectively 'truer' understandings. Her stance is, unfortunately, easily mis-read, especially by those steeped in epistemic reflexivity, as advocating a position that aspires to *displace*, rather than one that seeks to *debate*, existing ways of making sense of the effects of definition and classification. We, in contrast, interpret Marks' attentiveness to contingency as resonant with an understanding of craft as 'the workmanship of risk' (Pye, 1995) in which there is an awareness of how 'the quality of the result is continuously at risk during the process of making' (p.20). Contingency is recognized through the situatedness of practice, particularity of materials, and above all, is associated with the limitations of knowledge producers who are not 'all-seeing gods' but 'very much part of what we survey' (Chia, 1996: 54). In sum, the contribution of disruptive reflexivity is not to advance, refine or falsify claims to objectivity found in 'the workmanship of certainty' but rather to value and maintain openness, thereby permitting new possibilities.

It is important to caveat these claims by emphasizing the limits to disruption, or what we might wish to conserve from current practices of knowledge production. We illustrate this using the example of the academic peer review process as a potentially productive site for

greater disruption of epistemic and normative conventions and customs. At the same time, we suggest there are certain normative and ethical aspects of these practices that deserve to be supported and maintained. Disruptive reflexivity is necessary in order to challenge the semblance of openness that is associated, for example, with State-led research assessment exercises, which selectively use peer review to legitimate the restructuring of higher education institutions and withdrawal of funding from individuals and departments (Willmott, 2003). It is also needed to resist systems of knowledge production associated with highly ranked journals, which use peer review to prioritize, and occasionally fetishize, epistemic reflexivity at the expense of disruptive reflexivity, resulting in elitist, conservative systems of producing knowledge that tend to exclude other ways of knowing which are not compliant with these (restrictive) norms (Bell et al., 2017; Bell, Meriläinen, Taylor and Tienari, 2019). However, some aspects of peer review systems of knowledge production have ethico-political or crafty potential which warrants their ongoing support. This arises as knowledge producers - including journal editors, reviewers and authors - develop affective relations between themselves and the 'objects' they engage with (Bell and Bridgman, 2019). Similar to the craftsperson, these embodied, enacted and sensuous practices are characterised by care or love (Kiriakos and Tienari, 2018), rather than self-aggrandisement or defensiveness.

The significance of craftiness: Working with indeterminacy

As the preceding discussion highlights, the significance of craft in the social sciences arises from indeterminacy that mobilizes constitutive, epistemic and disruptive reflexivity. Indeterminacy is evident in the 'insecurity regarding the basic assumptions, discourse and practice used in describing reality' (Pollner, 1991: 370). Indeterminacy defies everyday as well as scientific closure. As Amis and Silk (2008; see also Sandberg, 2005) note, recognition

of indeterminacy is acknowledged and embraced by exponents of a postfoundationalist orientation to the production of social scientific knowledge. Instead of striving to establish the adequacy of categories, research-as-craft attends to the ‘moral, social and political consequences, of constructing categories’ (Amis and Silk, 2008: 467). Researchers who disregard or deny the significance of indeterminacy are more inclined to favour a form of scientific practice that requires compliance with criteria such as internal and external validity, reliability, and generalizability. Scientific practices that seek to minimize indeterminacy aspire to impose fixity and stasis on entities that are in constant flow (Burrell, 1996). Where discipline drives out openness, analysis becomes violent as, for example, it simplifies in order to prescribe a classificatory order.

Research-as-craft is exemplified by Kondo’s (1990: 24) account of knowledge production as ‘a complex negotiation, taking place within specific, but shifting, contexts where power and meaning, “personal” and “political” are inseparable... [Acts of crafting] are the complicated outcomes of power-fraught negotiations between “Self” and “Other”’ (Kondo, 1990: 24). Knowledge production is as a work-in-progress where the scientist experiences and responds to moments when ‘it is no longer clear how the subject is to “go on”’ (Glynos and Howarth, 2007: 129). In such moments, constitutive reflexivity stalls as awareness of ‘the mess of relations not yet organized into terms such as “subject” and “object”’ (Manning, 2016: 29). In what Manning terms the ‘relational field of emergent experience’, the seemingly ‘pre-constituted subject-position external to the event’ has yet to be constructed and (impermanently) fixed (p.29). Craftiness accomplishes (precarious) closure by temporarily resolving the undecidability of contingency – for example by appearing to overcome the under-determination of theories by experimental facts (Pickering, 1986). Research-as-craft recognizes this craftiness and recalls the inescapable contingency of claims to objectivity.

A powerful demonstration of the three forms of reflexivity outlined above is provided in Delamont and Atkinson's (2001) study of doctoral students undertaking laboratory and field research. As undergraduates, these students had acquired a sense of science as comparatively settled, comprising '[d]emonstrations of classic phenomena [and] recapitulations of predictable laboratory procedures' (p.87). As Feyerabend (1993) notes, representations of science typically simplify and separate its participants, thereby 'making the history of science duller, simpler, more uniform, more "objective" and more easily accessible to treatment by strict and unchangeable rules' (p.11). Constitutive reflexivity can be seen to enable students to regard science as effectively 'settled' and 'predictable'. Later, when the doctoral students were undertaking their own research, they came to 'discover that "real" science is more complex' (p.88), and lacks the predictability they had presupposed. In other words, they came to experience such closure as an achievement that is contingent upon engaging what we have called epistemic reflexivity by developing the (crafty) capacity to work with indeterminacy in order to 'master' it (p.88). Only then was it possible for the doctoral students to generate scientifically warranted forms of 'closure' in the guise of stable, 'usable results'. Such efforts to address the discovery that "'real" science is more complex' had the potential to draw them towards awareness of another – disruptive – form of reflexivity. But this possibility is (craftily) neutralized as they acquired skills and tactics which confined their work within, and enabled them to defend, the boundaries of epistemic reflexivity. When engaging in (laboratory and field) practices of science, the apprentice researchers learnt that 'in order to produce useable results' they were required to 'master indeterminate skills and knowledge' (p.88), an acquisition of craft(y) skills that is also registered by Latour (1987) when he observes that scientists' research practices 'bear little resemblance to the models of scientific procedure' (p.6). So, for example, when seeking to publish their research, the apprentice scientists found that all reference to their exercise of

‘crafty’ capacities had to be excluded. No mention of indeterminacy and/or the intrusiveness of disruptive reflexivity was permitted as they ‘learn[ed] to write public accounts of their investigations which omit the uncertainties, contingencies and personal craft skills’ (Delamont and Atkinson, 2001: 88). As noted earlier, direct parallels can be drawn with management studies where, for example, processes of abduction are obscured by the separation of theory from method, leaving researchers ‘wishing to learn the craft of research’ ‘in the dark’ about the role of imagination in processes of scientific knowledge production (Van Maanen, et al., 2007: 1149-50).

The crafting of research is cast into shadow whenever a preoccupation with demonstrating the epistemic purity of scientific knowledge prevails. The resulting positioning of disruptive reflexivity as ‘dark’, and ostensibly dangerous, is an epiphenomenon of equating reflexivity with the refinement of epistemes. In a context where a conception of science confined to constitutive and epistemic reflexivity has become highly authoritative, negative professional and personal consequences can follow from questioning this restriction as it unsettles the stable narrative of how knowledge is produced (see Pratt, 2008; Bell et al. 2017). Thus, in a context where knowledge producers face increasing precarity and pressures (Bristow, Robinson and Ratle, 2017), including to publish their research in highly ranked journals that valorize epistemic reflexivity such that the production of theory as well as the generation and analysis of data is reduced to the demonstration of fetishised technique, it is important to acknowledge the potential elitism of craft values in promoting an ethos that is accessible only to the privileged few who have the security and resources to enable its pursuit. However, we suggest that this does not negate the potential of craft as a resource that researchers can use, individually and collectively, to challenge epistemic norms of scientific knowledge production which threaten to undermine the ethico-political significance of research.

We now elaborate on the imaginative and embodied characteristics of research-as-craft (Dant, 2010) understood as a flexible, accomplished working on, and with, physical or symbolic materials (Becker, 1978), before turning to consider how research-as-craft incorporates appreciation of the ethical and political dimensions of scientific knowledge production.

Beyond skill: Imaginative and embodied knowledge

Craft includes ‘skill’ but, etymologically, is not reducible to it. Research-as-craft speaks to aspects of inquiry that, in exemplifying a ‘turn to experience’ (Evered and Louis, 1981), disclose knowledge production as an imaginative, embodied process that is learned through processes of inter-subjective transmission (Lave and Wenger, 1991). When actively practiced, such affective relationships put the self at risk through a process of opening up to the other and letting go of ‘presumed certainties’ (Rhodes and Carlsen, 2018: 12). Imaginative creativity is an endemic, yet largely unacknowledged, feature of scientific practice that arises from the contingency and epistemic contestability of facts. Craft(iness) is largely obscured in disciplines such as medicine and law, and we suggest increasingly in the mainstream of management studies, by the requirement for ‘statements of fact’ without which ‘bases for treatment or judgement would be so shaky as to destroy public confidence not only in the knowledge that purports to inform... [practice], but in the social fabric of which these institutions comprise central threads’ (Code, 2006: 96). Building on Haraway’s conception of ‘situated knowledge’, Code’s (2006) proposal of ‘negotiated empiricism’ acknowledges the complex construction of location as a basis for producing empirically-based knowledge. This offers a means of engaging ‘*critically in and with* the material and affective-political detail of situations, as natural sites of knowledge making inhabited by particular fallible, vulnerable

human beings' whose epistemic practices are shaped by the institutional context 'within which they craft their knowledge' (Code, 2006: 117, emphasis in original).

The imagination that Mills (1959) terms 'intellectual craftsmanship' is fuelled by suspension of belief in accounts of knowledge production framed as an impersonal, asocial process of devising and testing propositions by applying theory and following methodological protocols. Intellectual craftship is threatened by methodological fetishism, resulting in a devaluing of imagination, especially where scholarship is designed or retrofitted to comply with restrictive, self-referential norms of many 'top-tier' journals (Alvesson and Sandberg, 2013). Imagination is then disciplined (Weick, 1969) to the point that it is confined exclusively to epistemic reflexivity.

However, when the openness of craft(iness) is not entirely suppressed by the rigors of epistemic discipline, there are ways of subverting the creeping impoverishment of imagination. Abbott (2004) advocates analogical reasoning, taking inspiration from surprising and unconventional sources, and borrowing analytic frameworks and language from other disciplines. Deetz (1966) commends 'postmodern' literary theory for disclosing how 'the indeterminacy of the text is reclaimed against any fixity of determination' (p. 391). With regard to embodiment, craft implies an intimacy of engagement, a process of bringing objects into being (Heidegger, 1971), as form is constituted through physical, phenomenological interactions with materials of making (Atkinson, 2013; O'Connor, 2017). Invoking embodiment, Abbott urges researchers to 'come at an issue with only a gut feeling that there is something interesting about it... Indeed, figuring out what the puzzle really is and what the answer ought to look like often happens in parallel with finding the answer itself' (Abbott, 2004: 83). In its recognition and valorization of imagination and embodiment, research-as-craft speaks to a more or less purposive 'act of extending our person into the subsidiary awareness of particulars which compose a whole' (Polanyi, 1958: 65), using

embodied curiosity to fire the imagination. This imaginative approach is consistent with Feyerabend's (1993) concept of counterinductive theory development, whereby hypotheses that are inconsistent with generally accepted ways of thinking are intentionally created. Such openness relies on adoption of a 'pluralistic' methodology that draws on theories from 'wherever one is able to find them' (p.33), including ways of knowing that are silenced by colonizing cultures (see Connell, 2007). For example, Kvale and Brinkmann's (2009) commentary on the conduct of interviews commends an approach that relies on repeated imaginative responses to indeterminacy and contingencies learned through experience and absorbed through practice. Trust in 'gut feeling' and a willingness to inhabit indeterminacy is also illustrated by Barley's (2004) notion of 'puddle jumping' – a physical metaphor that conveys imaginative craftiness and recommends improvisation by pilfering from other fields and collecting 'disparate ideas with the hope that they may prove relevant for future innovation' (Abbott, 2004: 77).

The corporeality of craft acts as a 'tool of human feeling' (Yanagi, 1972: 108; see also O'Connor, 1997) that helps to problematize, and thereby re-unite, dualisms of subject and object, mind and body. It has the capacity to engender embodied receptiveness to how phenomena 'develop, and change throughout a process, requiring minute, subtle reactions and decisions' (Hardy, 2004: 181). When commenting on her orientation to studying Japanese artisans, Kondo (1992) notes how 'the aim is to go beyond a purely cognitive level of learning, and to learn with the body' (p.47). This aspiration foreshadows Abbott's reference to 'gut feeling' (Abbott, 2004: 83), gesturing to how scientists participate with matter in movement, entering the flow, and surrendering to the material, following where it leads them (Deleuze and Guattari, 2004; Rhodes, 2009). This can be facilitated by cultivating an embodied, rather than overly cognitive orientation to processes of knowledge production, as alluded to by Allay (1998) who characterises 'scientific writing' as 'a craft that requires

preparation... Running, walking, and bicycling... give you a chance to think about the structure of a document, play a strategy in your mind, and see if it makes sense... long enough that I begin daydreaming' (p.234). A further illustration of embodied research practice is provided by Turner^v who reports how he was 'deeply influenced' by Mills' (1959) concept of 'craftsmanship' which he takes to be a practical, embodied project that relies on physical preparedness.

Recognition of the embodied nature of research activity problematizes and erodes the separation of mind and body and enables creativity to flow in undirected and unanticipated ways (Ingold, 2007). By unleashing imagination and embodied feeling, a sensibility emerges that counteracts the reduction of 'the world to a spectacle and our own bodies to mere mechanisms', reflecting a loss of 'vitality, that mysterious richness' which characterises 'our common experience' (Langer, 1989: 15). When Cartesianism is unsettled by disruptive reflexivity, knowledge production is no longer apprehended as the outcome of an inner, dematerialized, cerebral self that gathers and processes information to know and master the outer world of matter (Lewin, 1985). Instead, knowledge is understood as inextricably situated, fostering awareness of how materials are in process, always on their way to becoming something else (Ingold, 2013; Barad, 2007).

Craft as politics and ethics

Craft has a long historical, as well as etymological, connection with politics and ethics. In the eighteenth century, craft encompassed 'political acumen and shrewdness' (Dormer, 1997: 5). Before that, practices of witchcraft were associated with the exercise of occult power and secret knowledge that presented a challenge to conventional, religious wisdom. Politics, ethics and craft came together in the formation of the Arts and Crafts Movement (Krugh, 2014; Ullrich, 2004). The Movement presented an ethical and political

challenge to Modernist orthodoxy, which presumes that advances in engineering and technical expertise necessarily deliver promised social, moral and spiritual improvements in addition to material benefits (Naylor, 1971; Krugh, 2014). Assessments of the Movement have tended to focus one-sidedly on its adherents' elitist assumptions and nostalgia for an idealized golden era, yet its members' were guided by an ethical and political commitment to create a different and better, less brutalising, modernity by 'seeking to re-enchant and re-embed "Life" in a new kind of society' (Crook, 2009: 29)^{vi}.

When Mills (1959) invokes the notion of intellectual craftship, he insists researchers must engage with politics as well as ethics. He invites researchers to abandon a 'bureaucratic ethos' of inquiry where standardization and rationalization is prioritized, and where politics and ethics are ostensibly removed by demonstrating compliance with methodological procedures. They are urged to take personal responsibility for the form and consequences of scientific work – a responsibility that, ethically, involves 'a choice of how to live as well as a choice of career' (p.216)^{vii}. Mills' injunction is echoed by Law (2004) who foregrounds ethical and political moments in the production and dissemination of social scientific knowledge, and notes that accounts of research practice are contingent constructions that can be 'otherwise' (p. 143). The presence of politics and ethics is also articulated by Rouse (2001: 197) who states that '[a] modest and self-critical attentiveness to our own partiality and situatedness, and accountability for what we say and do, are the political responsibility incurred by our own contingent positionings within the cultures of science'. This responsiveness incorporates appreciation of how ways of framing and fulfilling ethical commitments are contingent on participation in, and influenced by, a broader structure of social relations, including engagement in research communities that support particular practices. Consequently, social science is made intelligible as a complex of practices enacted by 'ethical' as well as 'political subject[s] 'who [take] action in response to the call of the

ethical demand' (McMurray, Pullen and Rhodes, 2011: 557). This understanding is attentive to the 'contingency, historicity and precariousness' of practices in a way that appreciates 'the *constructed* and *political* character of social objectivity' (p.557, emphasis in original).

Likewise, 'the way we write' is 'intertwined [with] aesthetic, moral and political dimensions that themselves limit what is able to be said and to whom we are able to say it (Grey and Sinclair, 2006)' (Rhodes, 2019: 25). By challenging restrictive modes of scientific representation, and by seeking to cultivate 'new ethical and political practices' (Gilmore, Harding, Helin and Pullen, 2019: 3), including those rooted in feminine/feminist understandings of the body and female difference (Cixous, 1976), research-as-craft acts to liberate practices of knowledge production from their 'self-imposed conservatism' (Rhodes, 2019: 24).

While craft(iness) is present, and can be actively engaged, in the reporting of scientific inquiry, it also evident in the subversive potential of research-as-craft where 'transgressive academic practice... exposes the relations between truth and power' in politically important ways (Schubert, 1995: 1005), or facilitates and supports the development of alternative organizations (e.g. Esper, Cabantous, Barin-Cruz and Gond, 2017). Notably, craftiness inspires possibilities, as Marks (2008) notes, for social scientists to contribute to a parallel, expansive transformation of scientific practice that challenges Cartesian dualisms. It can thereby amplify political and ethical critiques of much of what is normalized and 'industrialized' in social science when framed within the restrictions of epistemic reflexivity (Mills, 1959; Pollner, 1991; Law, 2004; Symon, Cassell and Johnson, 2016; Bell et al., 2017).

Discussion: Crafty capabilities

Our conjecture has been that craft(iness) is more or less consciously and purposefully exercised, developed and valued by researchers as they struggle with indeterminacies that repeatedly destabilize their practices. While some degree of craftiness, in the form of ethics and politics, is endemic to research activity, it is routinely unacknowledged or actively suppressed. The presence and significance of craft is explicitly signalled only when it is directly attributed to some aspect of research practice. Yet, scientists – natural and social – continuously undertake the ethically and politically significant work of creating or maintaining their favoured approach because they must: indeterminacy demands (crafty) initiative and improvisation to sustain established scientific practices but also, potentially, to disrupt and transform them. Irreducible to a formula, or to a set of protocols, craft(iness) involves ‘a preparedness to confront the unknown. It is tied inextricably to the freedom to think freshly, to see propositions of every kind in an ever-changing light’ (Boyer, 1990: 17, cited in Alvesson and Sandberg, 2013: 143).

Preparedness to confront the unknown is consistent with a conception of research-as-craft in which disruptive reflexivity is incorporated, rather than domesticated by epistemic reflexivity. It makes no presumption that a remedy can be found for the ‘messy and problematic’ (Lynch, 2000: 4) nature of scientific practice. Ontological openness is understood to have primacy. Forms of ontic closure, which are simultaneously compelling and precarious, are accomplished through practices of constitutive and epistemic reflexivity, and are unsettled by disruptive reflexivity. Research-as-craft recollects the contingencies that produce the *sense* of closure, but without claiming that its attentiveness transcends contingency. Indeed, research-as-craft is itself another manifestation of ontic closure. But insofar as it intentionally destabilizes foundationalism, exemplified by epistemic reflexivity, it is less prone to reductionism and/or formulaic practices. By acknowledging, rather than

concealing, its contingent articulation, research-as-craft is, we argue, more open and inclusive in representing scientific knowledge production.

By incorporating disruptive reflexivity, research-as-craft pushes back against, and thereby destabilises, ostensibly disembodied, value-free, apolitical conceptions of scientific activity. In contrast to research-as-technique (Hammersley, 2011; Bell et al., 2017), research-as-craft accounts for, and fosters awareness of, the positioned or situated nature of knowledge where ‘location is about vulnerability; location resists the politics of closure’ (Haraway, 1988: 590). Resistance to closure, enabled by the unsettling effects of disruptive reflexivity, and supported by other ‘multi-perspectival’ and ‘positioning’ modes of reflexivity (Alvesson et al., 2008: 482-6)^{viii}, is incorporated into the comparatively open framing of research-as-craft. This is, we contend, consistent with an etymology of craft(iness) that includes ingenuity as well as slyness, and implies deviation from and disruption of conventions – a sensibility characteristic of receptivity to openness rather than compliance with discipline (March, 1996). Such openness facilitates disclosure of how, in Haraway’s words, ‘[r]ational knowledge is power-sensitive conversation’, such that science ‘*becomes the paradigmatic model, not of closure, but of that which is contestable and contested*’ (p.590, emphasis added). The sensitizing concept of research-as-craft signals the contingent boundary conditions of generating and evaluating knowledge claims in ways that make apparent their precarious, ethico-political basis.

Research-as-craft fosters and conveys the subtlety and ineffability of the interplay between researcher and researched. In place of the researcher as a transcendent subject, ‘ultimate arbiter’ or falsifier of the validity of theoretical propositions (Alvesson and Sandberg, 2013: 145), s/he is portrayed as engaged in an open, critical dialogue in which ‘there are not self-certifying epistemic foundations immune from criticism’ (Rouse, 2001: 197). Accordingly, apprehending and articulating ‘the set of contingencies that play on

others' (Van Maanen, 2011: 219) – the subjects of research – and representing their world 'in a "different light"' (Dey and Nentwich, 2006: 13) requires an exercise of craftiness that comprises practical, embodied ethics in the form of 'subtle reactions and decisions' (Hardy, 2004: 181), as well as political acumen and shrewdness in communicating knowledge claims (Dormer, 1997).

We therefore invite researchers to take up the notion of research-as-craft as a way to examine and potentially shift self-understandings and associated practices from that of 'the neutral expert observer to engaged interpreter and facilitator' (Cunliffe and Scaratti, 2017: 41). Practising research-as-craft through experiential being-in-the-world (Sudnow and Dreyfus, 2001) problematizes the reduction of knowledge production to a cognitive activity. It resists pressures to shoe-horn, or reverse engineer, research in order to make it compliant, at least dramaturgically, with notions of validity and reliability (Cornelissen, Gajewska-De Mattos, Piekkari and Welch, 2012). When actively and self-consciously pursued, research-as-craft expands 'the reach of our thinking, of seeing what else we could be thinking and asking, of increasing the ability of our ideas to deal with the diversity of what goes on in the world' (Becker, 1998: 7).

By pursuing the 'workmanship of risk' (Pye, 1995), the crafty researcher negotiates a path through 'the irrationality, complexity, and paradoxicality of organizational worlds' (Prasad, 2005: 292). Instead of striving to domesticate indeterminacy through formulaic representations, recognition of craft(iness) in research practice respects the 'radical contingency of materiality' (Glynos and Howarth, 2007: 129). By attending to this contingency, and drawing out the performative significance of the marginalization of openness in processes of knowledge production, research-as-craft points to 'the end of political innocence' (Law, 2004: 149) that is associated with the attempted separation of truth from politics. Disruptive reflexivity interrogates this separation as it dis-closes how '[t]ruth

and politics go together one way or another’; ‘once the performativity of method is recognised this implies responsibilities to both [truth and politics]’ (Law, 2004: 149). Conceived in this way, research-as-craft apprehends knowledge production as an ethical and political process wherein craftship encompasses experiential, pre-codified understandings of the potential and limitations of our embodiment, our relatedness to, and dependence upon materialities (Collins, 2004).

Finally, and reflexively, we acknowledge that our conception of research-as-craft may itself be interpreted as a crafty application of two forms of reflexivity outlined earlier. Constitutive reflexivity, it may be argued, has been mobilised to suspend doubt in the credibility of our conjectures on research-as-craft. It may also be suggested that our thematising of research-as-craft exemplifies disruptive reflexivity inasmuch that it problematizes accounts of scientific activity in which the presence of craft(iness) is disregarded or suppressed. More specifically, ‘disruptive reflexivity’ is evident in our attentiveness to how, ‘scientific practices do not reveal what is already there as its reality-in-itself defies our reach; rather, what is “disclosed” is the effect of the intra-active engagements of our participation with/in and as part of the world’s differential becoming’ (Barad, 2007: 361; see also Rhodes, 2009; Diprose, 2012).

Conclusion

The presence of craft in research is widely signalled but seldom thematized. This omission is problematic because the practice of science involves the crafty work of struggling with indeterminacy in order to establish and maintain shared frames of reference (e.g. paradigms of inquiry) within which knowledge is warranted. Thematising the presence of craft in research can, we have suggested, facilitate a re-visioning of the theory and practice of how scientific knowledge is produced. Invocations of craft in practices of scientific

knowledge production and communication, we have claimed, signal an inherent feature of scientific activity that is intuitively resonant, yet rendered opaque through omission or suppression. The notion of ‘research-as-craft’ has been commended for fostering awareness of (social) scientific practice as an ethical and political, as well as skilful, embodied and imaginative activity. Etymologically, craft encompasses power (politics) and virtue (ethics), as well as science. It thereby presents an alternative to Cartesian conceptions of science that presume, or aspire to attain, neutrality and objectivity. Within a post-Cartesian conception of scientific knowledge production, the researcher-as-craftist is enjoined with the artefact in the process of its formation (Cooke, 2007).

When conceived and executed as a craft(y) practice, scientific knowledge production is understood as an activity that is more embodied, less certain, less cognitive and more emotionally demanding (Broussine, Clarke and Watts, 2014). By connecting scientific practice to the ethics and politics of craft (and craftiness), and especially to ‘its genesis as a social critique’, we have surfaced how central elements of craft have ‘always had a subversive potential’, while underscoring a lack of ‘sustained critical attention’ (Cooke, 2007: 6), despite being repeatedly invoked in accounts of scientific knowledge production.

Research-as-craft fosters a subversive sensibility, but it does not directly advocate any particular form, or means, of social scientific knowledge generation. It takes seriously the indeterminacy associated with understanding that the meaning of terms like ‘quality’ and ‘rigor’ is contingent upon their development and application within specific intellectual traditions and contexts. Because there is ‘no consensus on universally applicable epistemic virtues’ (Ketokivi and Mantere, 2010: 310), the ‘choice’ of subscribing to research-as-craft as a practice, or as a characterization of scientific practice, is ‘ultimately arbitrary in a logical sense’ (Cornelissen and Harley, in press). Hence researchers must rely on the exercise of ethics-in-practice to make the required leap of faith.

Our position does not dismiss forms of knowledge production based upon epistemic reflexivity. Instead, we invite openness about, and acknowledgment of, how engaging any methodology involves craft(iness) as researchers struggle, in diverse ways and with varied outcomes, to demonstrate methodological compliance or to become their ‘own methodologist[s]’ (Mills, 1959: 135). Research-as-craft does not deny the distinctive contribution and application of ‘discipline’ – with respect, for example, to ‘learn[ing] something from overall attempts to codify methods’ (ibid: 136). Instead it attends to, and valorises, an ‘openness’ that allows and enables ‘theory and method [to] become part of the practice of a craft’ (ibid: 246). Research-as-craft thereby challenges the consistency of advocating seemingly universal epistemic values, such as those of coherence and inference to the best explanation, while simultaneously acknowledging that scholars ‘go about reasoning *within and as part of* their chosen approach’ (Harley and Cornelissen, in press, emphasis added). Most importantly, craft-as-research directs attention to how struggles with indeterminacy required to produce scientific knowledge are animated by (contingent) ethical commitments and political forces that establish and secure transient forms of determination, or closure. The sensibility of research-as-craft provides a reminder of how ethical and political work, embodied and imaginative, is required not only to establish ontological closure and protect it from disruption, but also to challenge the basis of such attempted protection in scientific research.

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Notes

ⁱ **craft (n.)** Old English *cræft* (West Saxon, Northumbrian), *-creft* (Kentish), originally “power, physical strength, might,” from Proto-Germanic **krab-/kraf-* (source also of Old Frisian *kreft*, Old High German *chraft*, German *Kraft* “strength, skill;” Old Norse *kraptr* “strength, virtue”). Sense expanded in Old English to include “skill, dexterity; art, science, talent” (via a notion of “mental power”), which led by late Old English to the meaning “trade, handicraft, calling,” also “something built or made.” The word still was used for “might, power” in Middle English.

crafty (adj.) mid-12c., *crafti*, from Old English *cræftig* “strong, powerful,” later “skillful, ingenious,” degenerating by c. 1200 to “cunning, sly” (but through 15c. also “skillfully done or made; intelligent, learned; artful, scientific”) from craft (n.) + -y (2). Related: Craftily; craftiness.

Source: <https://www.etymonline.com/word/crafty> [accessed 12 June 2018]

ⁱⁱ The underdetermination of action by antecedent constraints and the overdetermination of interpreted constraints impedes and disrupts efforts to exclude or remove craft from science, as exemplified by the representation of methodology as technique (Bell et al, 2017).

ⁱⁱⁱ ‘Indexicality’ is a manifestation of indeterminacy: ‘All meanings are constantly subject to negotiation and renegotiation as expressions are used and concepts are applied. We may say, in the unsatisfactory philosophical idiom, that both the sense and reference of expressions is continually problematic, and that neither the intension nor extension of concepts can be delineated clearly, fully, and “objectively” in advance of use’ (Barnes and Law, 1976: 226).

^{iv} Sensitizing concept are usually derived from the research participants’ perspective – in this case, the ‘participant’ is the researcher who characterizes some aspect of his or her practice as ‘craft’ – that suggests a certain line of inquiry. See Van den Hoonard (2008).

^v Turner, B. ‘How to write practically’, *Writing Across Boundaries*

<https://www.dur.ac.uk/writingacrossboundaries/writingonwriting/bryanturner> [accessed 7 June 2018]

^{vi} The association of craft with politics and ethics, and its ‘subversive potential’ (Cooke, 2007: 6) to question and offer alternatives to industrial capitalism, continues today in the contemporary Craftivist Movement (e.g. Greer, 2008; Parker, 1996). Craftivism comprises participatory, community-based craft projects that address contemporary social, environmental and political issues, including global poverty, human rights injustices and degradation(s) of corporate and institutional culture (Black and Burisch, 2014; Bratich and Brush, 2011), as well as critiquing established, depersonalized means of addressing such issues (Vachhani, 2013). Its members celebrate continuity with, and renewal of, elements of the values and vision of the Arts and Crafts Movement.

^{vii} This injunction is echoed by Gouldner (1971: 489) when he contends that the ‘question [reflexive social scientists] must confront is not merely how to work but how to live’.

^{viii} On this point, we differ from Alvesson, Hardy and Harley (2008) who align ‘multi-perspective practices’ with what they term R-reflexivity whereas we identify its potential to contribute to D-reflexivity.