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Clarifying Action as Emerging Novelty: Disentangling Knowledge Creating in Routines

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**CLARIFYING ACTION AS EMERGING NOVELTY: DISENTANGLING
KNOWLEDGE CREATING IN ROUTINES**

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CLARIFYING ACTION AS EMERGING NOVELTY: DISENTANGLING KNOWLEDGE CREATING IN ROUTINES

Thematic Track: The Emergence of Novelty in Organisations

Abstract

Our understanding of knowledge creating characteristics in routines is in its infancy. Research on generative and emergent qualities of organisational routines, and their ability to assist actors arriving at new distinctions in practice, remains underdeveloped. Routines theory has been used to demonstrate processes as being generative (Feldman & Pentland, 2003; Pentland, Feldman, Becker, & Liu, 2012), as producers of ideas and as emergent (Feldman, 2000). More recent efforts have argued for a dialogical approach to studying how new organisational knowledge emerges. This paper looks at organising for 'knowledge creating' by combining dialogical exchanges within the ostensive-performative theory of routines (Feldman & Pentland, 2003). The explanatory power of the ostensive-performative aspects of routines is enhanced when we incorporate dialogical exchanges. We explore within sociomaterial practices (D'Adderio, 2011; Orlikowski, 2010) how schemas (Feldman, 2000; Sewell Jr, 1992; Tsoukas, 2009b) and imaginal others coalesce with artifacts as a source of knowledge creating. This forms our basis for understanding knowledge creating and novelty. Empirical data from a multi-level analysis in a university-industry context is presented. The inter-organisational context of an internship/work placement routine is argued as an appropriate context for studying processes of knowledge creating i.e. the theory-practice divide (Gibbons et al., 1994; Huff & Huff, 2001; Liu, Xu, & Weitz, 2011; Narayanan, Olk, & Fukami, 2010). Our empirical contribution is to substantiate how routines, from a dialogical exchange perspective, clarify action as new distinctions emerge. We conclude by focusing on the emerging construct of 'clarification' as it contributes to the dualist-dualism debates (Farjoun, 2010; Feldman & Orlikowski, 2011; Pentland et al., 2012).

Introduction

Knowledge Transfer, Creation and Creating

Scholarly research on knowledge creation has previously been subsumed and supplanted by a knowledge transfer research agenda. The knowledge management (KM) cycle assumes (Awad & Ghaziri, 2004; Hislop, 2004) knowledge is created, codified, transferred and realised through the direct intervention by management (Grover & Davenport, 2001). Due to disciplinary constraints the knowledge management field has tended to focus on measurable aspects of transfer, for example in a university-industry context such as the development of patents (Agrawal, 2001; Agrawal & Henderson, 2002). This has led to the tendency for linear descriptions originating from the information processing paradigm (Simon, 1973) and the behaviourist approach to observing inputs and outputs in systems (Von Bertalanffy, 1972). While much of the research focuses on improving transfer little is known about the first stage in the KM cycle; ‘knowledge creation’.

Nonaka & Takeuchi (1995) attempt to address this gap arguing that at the core of the new theories of management relating to knowledge is “*acquisition, accumulation, and utilisation of existing knowledge*” but that “*they lack the perspective of ‘creating new knowledge’*” (1995 p49). As we seek out potential sources of organisational capabilities, they note that “*knowledge creation by the business organisation has been virtually neglected by management studies*” (1995 p xiii). They argue that the dynamic nature of the world says organisations should be studied from “*how it creates information and knowledge, rather than with regard to how it processes these entities*” (p15). They conceptualise knowledge creation as modes of knowledge conversion between tacit and explicit knowledge (Nonaka, 1994; Nonaka & Takeuchi, 1995).

This initial attempt to tackle this gap, while admirable, is dangerously close to previous efforts to research knowledge transfer with the modes of conversion been criticised as rehashed versions of the theories relating to transfer (Gourlay, 2006; Kaufmann & Runco, 2009). Therefore those who do focus on ‘creation’ within the KM cycle tend to focus on, explicit entities and events, which create something dynamic after an event compared to the conditions before. Created knowledge flowing from this event is thus understood as explicit and transferable as an output i.e. a patent. This serves to highlight how Nonaka et al’s attempts are hampered by an eventual, i.e. focused on events, perspective based on explicit knowledge. This results in difficulties for empirical observation focused on the exact time of creation and implies that the conditions before and after this event are less important. Acknowledging this calls have been made for a process framework, within the field of knowledge management, focusing on the ‘*knowledge process and the context in which that process is embedded*’ (Grover & Davenport, 2001 p.12). This focus on events of creation, much like an event of transfer, causes difficulties from an ontological and epistemological perspective (Chia, forthcoming) as it implies something from nothing or what is termed *creatio ex nihilo*’ (Tsoukas, 2009b). Research of this specific nature is erratic, potentially requiring longitudinal field work with highly fine tuned data collection methods, requiring extremes in serendipity under experimental conditions. Identifying created knowledge and devising appropriate methods to capture this event still evades researchers in the social sciences.

With this in mind a processual view of knowledge creat-‘ing’ moves us from organisation to organising and from structure as a thing to structure as process (Feldman, 2000). Whereas the discussion around ‘*creatio ex nihilo*’ can be seen as an epistemological discussion the practicalities linked to application focuses research around asking what are the processes or generative mechanisms associated with knowledge creating (Tsoukas, 2009a; Tsoukas & Mylonopoulos, 2004)? For this reason this paper adopts a processual approach favouring knowledge creating over creation. In conclusion we call for a departure from this hegemonic approach in favour of a processual approach to understanding how organisations create new knowledge i.e. knowledge creating. In this context, informed by Tsoukas’ question “what are the generative mechanisms leading to new organisational knowledge” (Tsoukas, 2009a), we similarly ask what are the processual characteristics related to knowledge creating? By addressing this gap we provide a pathway toward a better understanding of knowledge creating and a more comprehensive approach than has been previously suggested. Our theoretical contribution, together with highlighting principles for processual knowledge creating, is in our theoretical conceptualisation by combining two approaches; a dialogical approach to knowledge creating (Tsoukas, 2009a; Tsoukas, 2009b) and routines as generative systems i.e. ostensive-performative aspects of routines (Feldman & Pentland, 2003; Pentland & Feldman, 2005). We argue that this combined processual approach provides a more robust and comprehensive theory and we substantiated our conceptualisation of knowledge creating with empirical evidence. We conclude by arguing for the importance of dialogical exchanges at the centre of routines theory and suggest the emergence of generative routine dynamics as a separate distinct focus within routines theory and as a potential dominant approach to knowledge creating.

The University-Industry Context

Gibbons et al (1994) introduced a modal theory of societal knowledge production revealing how governments, employers and society increasingly interact to produce knowledge. Knowledge transfer research into patents (Agrawal & Henderson, 2002), the absorptive capacity of firms to take advantage of knowledge spillovers from universities (Cockburn & Henderson, 1998; Cohen & Levinthal, 1989, 1990) and research into the success of incubation centres as an inter-organisational context have received extensive scholarly attention. Informed by the rich heritage from knowledge transfer research a university-industry context was considered appropriate for rich quality data relating to knowledge creating. Recently there are increased calls for researching knowledge creating in a context of application (Gibbons et al., 1994; Huff, 2000; Huff & Huff, 2001; Nowotny, Scott, & Gibbons, 2001) spanning a theory-practice divide have been made (Van De Ven & Johnson, 2006; Van De Ven & Poole, 1995). In addition questions about the role of universities and specifically the agenda of business schools (Huff, 2000; Huff & Huff, 2001) have also been raised. As a consequence the modal form of knowledge production relating to research in ‘application’ underpinned by interdependent relationships between employers and academic institutions informed the context of this study. The core of Gibbons et al’s (1994 p.13) thesis is “*that the parallel expansion in the number of potential knowledge producers on the supply side and the expansion of the requirement of specialist knowledge on the demand side are creating the condition for the emergence of the new mode of knowledge production*”. Therefore on a macro level

interaction between producers (university) and consumers (commercial organisation) would provide a rich picture of knowledge creating processes.

The Internship/Placement Programme

Within the theory-practice context an internship/placement routine connecting employers with a university, was adopted for this study. We present the case of an internship programme, capturing the day-to-day practices of its three main actor groups of institutional actors in an academic institution, employers and students across multiple sites. Data was collected from students through the process of placement from academic beginnings, through to employer sites and upon their return to a 'theory' based environment to complete their studies. Within the internship/placement programme, employers seek to recruit students from the university or higher educational institution (HEI) for periods of up to 16 weeks. The internship programme itself was taken as the substantive context for data collection. The internship/placement officer developed strong employer relationships, with varying degrees of commitment with some employers having long term partnerships over a number of years while others were newly formed relationships. This commitment to the internship/placement reflected different levels of resource allocation and varying understandings of the academic goals for the process. From a comparative perspective the various levels of commitment to the university-industry relationship formed the basis of how different documents, pro-forma, records, and procedures contributed to action and development of routines for handling the internship/placement process.

Building on the distinction made above between knowledge transfer and knowledge creation we argue for the appropriateness of a processual approach to knowledge creating in this theory-practice context. In the next section we outline and disentangle characteristics relating to knowledge creating. We then present the ostensive-performative aspects of routines as generative systems. To develop upon this we argue for utilising dialogical exchanges as the generative mechanisms within routine dynamics. Combined these form the foundational argument for understanding knowledge creating.

Disentangling the Characteristics of Knowledge Creating

From a review of the extant literature the importance of process, dynamic change, interaction and generative approaches emerged as being central to knowledge creating.

1. A Processual Approach – Appropriateness of Routines Theory: Knowledge creating within processes or systems has long been acknowledged in various research threads (Nonaka, 1994; Van De Ven & Poole, 1995). Fields such as systems thinking (Von Bertalanffy, 1972), processual analysis (Pettigrew, 1997; Van de Ven, 2007) and early literature on organisational routines (Nelson & Winter, 1982), specifically static organisational routines have focused on stable repeatable processes (Pentland & Feldman, 2005) often with defined measurable outcomes reflecting functionalist methods for data collection. Therefore how we describe processes in itself impacts on data collection methods (Van De Ven, 2007). Recent discussions of routines moves away from an emphasis on structure in favour of process emphasising a routine's "*ability to remember the past, imagine the future, and respond to present circumstances*" (Feldman & Pentland, 2003). This processual nature occupies "*the crucial nexus between structure*

and action, between the organization as an object and between organizing as a process” (Pentland & Rueter, 1994 p.484). This perspective represents organising as a process rather than as structure (Feldman, 2000 p.613) mirroring our discussion above from creation as an event to creating as process. As organisational routines have traditionally been seen as unchanging, static and closed (Nelson & Winter, 1982) recently their ‘*internal dynamic*’, and ‘*potential for change*’ (Feldman, 2000; Feldman & Pentland, 2003) has been illustrated. To understand the importance routines bring to bear on explaining change it is important bear the ‘processual nature’ of the unit of analysis in mind. In parallel and conversely it is argued that routines as a unit of analysis lend themselves to empirical studies relating to organisational change (cf. Becker, 2004 p.649). Both arguments are captured by Feldman’s who notes that an ever changing context producing continuous actions and outcomes. Thus routines, which are ever changing and dynamic in nature, provide the theoretical foundation for studying knowledge creating. We therefore adopt routines theory here as the unit of analysis that is best placed to understand knowledge creating as a process with internal dynamics and potential for change. The appropriateness of organisational routines for knowledge creating is elaborated on by the following points.

2. Dynamic Change as a Basis for Knowledge Creating: By approaching research with the assumption that the world is ever changing and dynamic, rather than static and stable, routines provide a more realistic unit of analysis (Pentland & Feldman, 2005) for knowledge creating. As a consequence seeing connections (Feldman & Rafaeli, 2002) in routines as sources of continuous change producing flows of ideas is a powerful starting point for studying knowledge creating. It is useful at this point to outline what we understand as dynamic change. Feldman’s empirical research on Residential Life concludes that routines are not inert but are continuously changing as actors change their performances. This might well be unintentional or go unnoticed (Feldman, 2003 p.749). In contrast a desired organisational change, the budgetary routine, can encounter difficulties when required actions for change might be inconsistent with the understanding of the routine performance. This internal dynamic resisting change is thus heavily influenced by agency and the role of actors in enacting performances of a routine (Feldman, 2000 p.611; 2003 p.749). Thus we argued for the inclusion of actors and agency within routines as the basis of what is dynamic change (Empson, 2001). It is the role of actors in routines that result in the internal dynamic of routines which supports our understanding of routines as being emergent.

3. Knowledge Creating as Interaction: Across many theories arguably contributing to our understanding of knowledge creating focus on interaction or interplay between two entities or constructs e.g. epistemology’s syntactic-semantic debate. Societal knowledge production points to the increasing density of communications (Gibbons et al., 1994; Nowotny, 2005) as core to the modal theory of knowledge creating at a macro level of analysis. More specifically, informed by the fields of creativity and organisational learning a dialogical approach to creating new organisational knowledge is proposed (Tsoukas, 2009). Tsoukas simply asks “*what are the generative mechanisms through which new organizational knowledge is created?*” He relies on the concept of ‘*social interaction*’, as the ‘*bedrock*’ for knowledge exchange practices as dialogicality or

interactions facilitate the emergence of new distinctions. But how does this give rise to new organisational knowledge and what particular form should social interaction take? Knowledge creating research, informed by a focus on what is dynamic i.e. inclusion of actors, must consider some form of dialogical exchange within a processual context. Indeed even Nonaka's SECI Model, for example, assumed the interaction between explicit and tacit knowledge was the basis of knowledge creation saying; "*knowledge creation at the individual level involves continuous interaction with the external world*" (Nonaka, 1994).

4. Producers of Ideas, Emergence & Being Generative: In conjunction with routines as process encapsulating dynamic change a third reason for broadly acknowledging routines as a theory of knowledge creating is that they are 'producers of ideas' (Feldman, 2000). She notes that "*one can think of routines as flows of connected ideas, actions, and outcomes. Ideas produce actions, actions produce outcomes, and outcomes produce new ideas, it is the relationship between these elements that generates change*" (p.613). Focusing on the role of actors within routines, as producers of ideas, increases our understanding of what is meant by dynamic. This is a more appropriate lens for understanding knowledge creating than those reflected in eventual approaches of knowledge creation. As practices in routines are always works-in-progress they are always unfinished products suggesting their 'emergent' quality with changing repertoires of responses, actions and in turn outcomes. Routines are argued in themselves to be generative. Pentland et al (2009 p.48) note "*when we say that organisational routines are generative systems, it means that there is some underlying mechanism that generates the interdependent patterns of action that we recognise as an organisational routine*". This highlights routines as generative structures with ostensive aspects of routines understood as generating performances (p.69, 92). Salvato (2009 p.68) also describes routines as generative and dynamic, rather than being static inert objects. This connects the notion of being generative to continuous change through performance of the routine. From an emergent and generative angle this fourth point compounds the connections with our understanding of processes of dynamic change as a basis for knowledge creating.

By exploring and disentangling knowledge creating characteristics guiding principles underpinning our conceptual framework emerged. As a processual approach routines theory is used to demonstrate processes as a source of continuous or dynamic change, as producers of ideas with emergent (Feldman, 2000) and generative qualities (Feldman & Pentland, 2003; Pentland et al., 2012). Scholarly research on generative and emergent qualities of organisational routines, and their ability to assist actors arriving at new distinctions in practice is in its infancy. This paper conceptually argues that a dialogical exchange analysis, within a processual context, forms the common denominator and bedrock of available theories contributing to knowledge creating. The next section outlines our conceptual framework which informs our methodological considerations.

Dialogical Exchanges & the Ostensive-Performative Aspects of Routines

This paper's theoretical contribution is to combine processual and dialogical approaches to knowledge creating. Building on the disentangled characteristics of knowledge creating a conceptual framework of dialogical exchanges within the ostensive-

performative conceptualisation of routines is proposed. The ostensive-performative theory of routines is understood as a generative system and provides us with our processual foundation. However we assert that this is only a partial picture in that a dialogical approach to routines further enhances the generative system that is the ostensive-performative theory within routines. Together these provide a more robust theory of knowledge creating. Six elements of the ostensive-performative aspects of routines, understood as a generative system are conceptually linked with three identified dialogical exchanges (See Figure 1). Their consistency and overlapping nature is argued as a good fit. Their connections and shared meanings reveal a cohesive conceptual framework informing data collection and analysis enhancing our understanding of generative routine dynamics.

Dialogical Exchanges within Routines

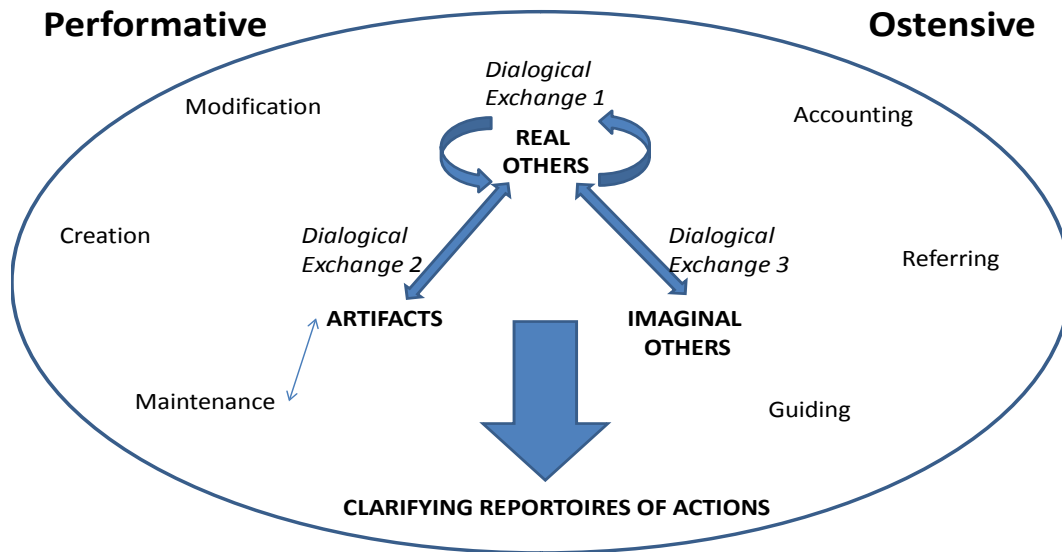


Figure 1: Conceptual Framework to Understand Generative Routine Dynamics

The Ostensive-Performative Theory of Routines

Routines theory is understood to handle the philosophical and conceptual challenges listed above. “Each part [of the routine] is necessary, but neither part alone is sufficient to explain (or even describe) the properties of the phenomenon we refer to as ‘organizational routines’” (Feldman & Pentland, 2003). It is this interaction between ostensive and performative aspects of routines they argue as being generative (Pentland & Feldman, 2005 pp793-795; Pentland & Feldman, 2008). The ostensive aspect of a routine allows people to “to guide, account for, and refer to specific performances of a routine” (Feldman, 2000). This process of guiding, accounting and referring is represented in dialogical exchanges as actors negotiate recognisable patterns of activities and refer to core actions required within routines. The performative aspect of the routine in turn “creates, maintains and modifies the ostensive aspect” (Feldman & Pentland, 2005). The goal is not to create, maintain or modify the routine but to engaging in actions so as to achieve the routines purpose. This affects and is affected by the structure

constraining and/or enabling future action. Interestingly actions related to maintenance might constitute ‘repairing’ suggesting that an altered routine is repaired toward a perceived equilibrium. Modification might occur through the use of the ideas of ‘striving’ and ‘expanding’ of routines. Together these provide a foundation for knowledge creating, involving actors linked to dynamic change (Feldman, 2000). More recent research has expanded this generative understanding of the ostensive-performative structure of routines (cf. Pentland & Feldman, 2005). Gaps however have been identified in this conceptualisation of generative routines. Whereas a lack of focus on agency was identified (Feldman & Pentland, 2003), some scholars have argued for more attention to be levied on the role of artifacts (D’Adderio, 2011). To overcome conceptual and methodological difficulties, calls for a broader perspective focusing on action as the basis of a proposed generative model have been made (Pentland et al., 2012). Pentland et al argue by focusing on action at the centre of routines we can incorporate both sociomateriality and agency i.e. the role of human and non-human actors within routines. These shifts in focus provide a less granular perspective and allows for the development of a more comprehensive understanding of routines as generative systems. The authors claim that this shift toward action contributes to our understanding of generative routines in five ways;

1. that action, from the variation and selective retention of patterns, is sufficient to explain routine dynamics.
2. that breaking from the focus of actors overcomes previous difficulties relating to the incompatibility of routines as dispositions and routines as pattern of action with action as a common denominator.
3. as action is distributed across actors and artifacts, respecting sociomateriality and agency, it is consistent with theories of practice. Indeed this is also consistent with actor-network theory and developments relating to sociomateriality.
4. that focusing on action offers observable testable predictions.
5. that focusing on sequences of actions as expressions of a routine the variation and selective retention of patterns as seen through action develops the evolutionary theory of routines.

In retrospect these developments are consistent with Feldman’s Residential Life research (Feldman, 2000, 2003; 2004) where observable actions revealed dynamic changes in routines relied on here as a central assumption of knowledge creating. From a data collection perspective there appears to be greater scope here to operationalise research while being consistent with evolutionary understandings of how routines change. While the focus on action goes some way toward consolidating a generative theory of routines and overcoming some conceptual challenges it also serves to combine the ostensive-performative aspects as a dualism (Feldman & Orlikowski, 2011) opposed to a duality (Farjoun, 2010) under the umbrella of action. Methodological difficulties over emphasising observable action as a panacea for all things generative still remain. For this reason further conceptualisation is required. The following section provides one such conceptualisation. Developing on action at the centre of routine we advocating for a focus on dialogical exchanges to further explain what we understand as being generative.

A Dialogical Approach to Routines

Social interaction or exchange is argued as the context leading to new organisational knowledge. While the structure and increasing density of communications is argued, at the macro level, to contribute to knowledge production in society (Gibbons et al., 1994), dialogical exchange is argued at the individual level (Tsoukas, 2009a) for new organisational knowledge. *“The essence of dialogicality is sensitivity to otherness”* (Tsoukas, 2009) and the *“realization that the categories we think and communicate with are no more individual creations but dialogically constituted through communication with others”* (p161). It is these transposable schemas (Sewell Jr, 1992), and the exercise of human judgement that results in new knowledge and the ability of individuals to be able to draw new distinctions (Tsoukas, 2009b). This raises the question as to how new distinctions are arrived at within routines? How do dialogical exchanges as a generative mechanism fit within this focus on action within routines? And while remaining true to action being at centre of a generative perspective how can dialogical exchanges contribute to action? Consistent with Gibbons et al’s (1994) exchanges for increasing the density of communications in society, and the emphasis on respecting sociomateriality and agency, Tsoukas (2009a) discusses three dialogical and quasi-dialogical exchanges; dialogical exchanges among real others, quasi-dialogical exchanges with imaginal others, and quasi-dialogical exchanges with artifacts.

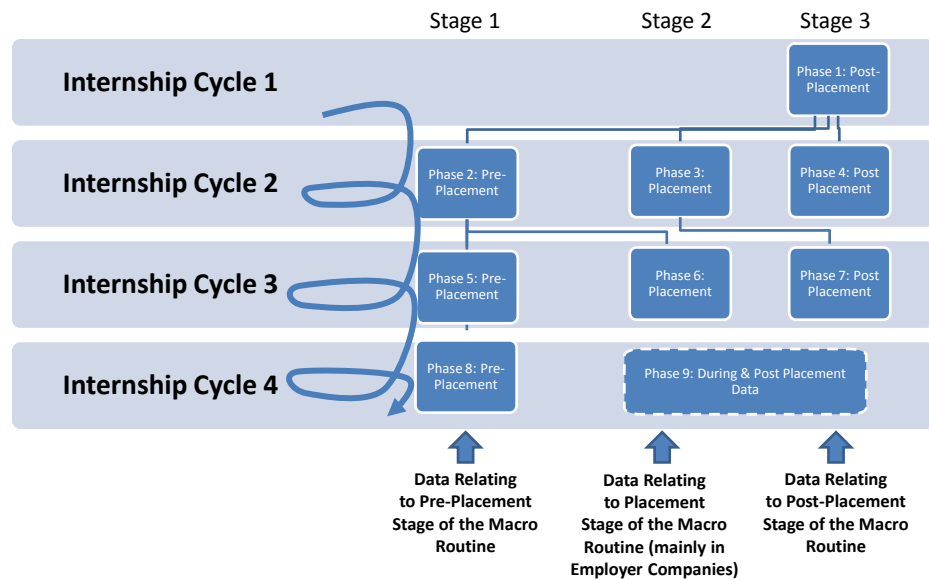
Dialogical exchanges with real others is the face-to-face dialogue with two individuals or ‘real others’. As the structure of conversations in diverse contexts such as detective work, nursing, medical diagnoses and educational practice unfold new distinctions emerge. Secondly there is a quasi-dialogical exchange with imaginal others where individuals are never really alone finding themselves talking arguing and responding to others, such as critics, friends, gods, their own consciousness, photographs, figures in their dreams or in the media. Tsoukas argues that the imaginal other is within us. This is not unlike authors in a dialogue with reviewers when revising a manuscript. In an organisational context the most theoretically salient imaginal other is the ‘generalised other’ such as ‘the employer’ or ‘the profession’ where actors learn to construct identities, roles, grasped relationships and further learn to adopt attitudes of the community or social group of which they become apart. The third dialogical exchange is a quasi-dialogical exchange with artifacts. Artifacts, ‘reference entities’ or ‘epistemic objectives’ are created by actors in the course of their work arguably codify aspects of routines consistent with the focus on ‘concrete practices’ in the communities of practice (COP) literature (Brown & Duguid, 1991, 2000). Epistemic objects and their importance to knowledge creation have been pointed out by many researchers. D’Adderio (2011) places artifacts at the centre of the performativity of routines. The use of material prototypes and models as objects help companies innovate, allowing verbalisations leading to richer conversations. More recently less material artifacts, arguably not unlike imaginal others, have received increasing attention (Leonardi, 2010) as they contribute to action or performativity. What is characteristic of artifacts as knowledge carriers is that they have an ‘ambivalent ontological status’. As stable and mutable they incorporate knowledge and act as repositories of what actors focally know. But they also incorporate knowledge that is not focally known and hence they are always work-in-progress open for further development in the process of making. As mutable objects they are inherently incomplete and capable of further development (Tsoukas, 2009a p.167).

By arriving at new distinctions the actors, involved in these dialogical exchanges, can be seen to generate knowledge within subjectively identified routines resulting in new organisational knowledge. We therefore explore how artifacts, actors and imaginal others (Tsoukas, 2009a; Tsoukas, 2009b) interact in and between organisational routines on multiple levels (Tsoukas & Mylonopoulos, 2004) to produce new organisational knowledge. It should be noted whereas the imaginal other is linked more closely to the abstract ostensive aspects of routines, artifacts are associated with the performative aspect of maintenance of routines (Figure 1).

The understanding of both the performative and ostensive aspects, through dialogical exchanges is argued to be necessary to appreciate routines as a ‘source of change’ (Feldman & Pentland, 2003). *‘Each part [of the routine] is necessary, but neither part alone is sufficient to explain (or even describe) the properties of the phenomenon we refer to as “organizational routines”’* (Feldman & Pentland, 2003). In conclusion the acceptance of the ostensive-performative theory of routines as a generative system provides the processual backbone for this study on knowledge creating. Dialogical exchanges using actors, artifacts and imaginal others, is combined with this theory of routines to illustrate contributes to action for knowledge creating.

Data Collection

Structure of the Data



3 Identified Stages of Data Collection in each Placement Cycle

Figure 2: Structure of the Data: Repetition in the Pattern of Activities

The Structure of the Data

Empirical data from a multi-levelled analysis in a university-industry context is presented. An inter-organisational context of an internship/work placement routine is argued as appropriate for studying processes of knowledge creating i.e. the theory-practice divide (Gibbons et al., 1994; Huff & Huff, 2001; Liu et al., 2011; Narayanan et

al., 2010). Due to the cyclical nature of the internship/placement routine (commencing and ending in September of each year) data was gathered, using multiple methods, across four cycles and nine identified stages from June 2009 to September 2012. The internship cycles included pre, during and post placement stages emerged from the shifting focus of the data relating to sub-routines and dialogical exchanges in the data corpus. This illustrates the cyclical nature of the pattern of activities of the macro internship routine (Figure 1). Phases 1 to 3 provided a foundation for understanding the macro issues impacting on internship/placements as well as the day-to-day practices of participants. Whereas previous research has looked at inter-organisational routines (Zollo, Reuer, & Singh, 2002) a more comprehensive approach to data collecting using multiple methods was taken as suggested so as to gain a more complete picture of the complexities associated with inter-organisational routines across multiple sites, multiple actors and multiple levels of analysis (Empson, 2001).

Field Notes and Research Journal: In accordance with Feldman's Residential Life research (2000, 2003) and as an embedded researcher extensive field notes captured multiple anecdotal conversations and observations relating to the management of the internship/placement programme over the four cycles. Field notes were timely recorded ensuring an accurate account of conversations and observations. Supplementing the field notes a research journal was used accounting for over 100 pages to progress my thinking and both sources were coded within Nvivo. This material detailing conversations were supplemented with emails, intranet postings and broader institutional communications pertaining to internship/placement.

Direct Observations: The pre-placement stages of each placement cycle was predominantly based in internship/placement classes run by the placement officer with a view to preparing students for imminent interviews, assessment centres and involved contributions from interested employers, the careers service and consultants providing CV development and interview preparation services. 15 'internship preparatory classes' were recorded and transcribed with each class being over 1h 30 minutes (in Phases 2, 5 & 8). These were recorded as a non-participant direct observer and additional notes were captured in field notes revealing dialogues and understandings of macro-routines lived by the actors involved. These 'classes' were also relevant for understanding the inter-organisational aspect between employers and institutional actors. By way of clarification the close relationship between main employer actors and the internship manager was also a factor in selecting this context so that inter-organisational routines could be discussed at a macro-actor level. In addition these provided insights into the dynamics between the internship service and student actors.

Interviews: Formal unstructured interviews were conducted with employers (Phases 3, 6 & 9), students (mainly Phases 2, 4, 5 and 7) and academic staff. These were conversational, guided by a topic guide targeted at processes and dialogical exchanges. Where possible students were interviewed pre, during and post placement. Where possible 'snowball sampling' resulted in peripheral actors being interviewed. Supplementing the data collection in the Higher Education Institution (HEI) formal interviews were conducted with the Placement Officer, Academic Quality Assurance Officer. Career Guidance Counsellors and Academic Head of Programmes. This proved valuable revealing differences in perspectives on macro quality assurance issues and the internship/placement as a macro routine.

Documentary Evidence & Artifacts: Documentary evidence and artifacts were collected including recruitment brochures, job specifications, promotional internship brochures from both the institution and employers, policy documents outlining academic standards at the HEI, sample CVs, slides and presentations. Over 250 emails, intranet postings and additional communications on platforms such as LinkedIn and Webexone [an intranet platform] were also collected. Intranet postings of communications to student actors from the Placement Officer and Academic Head of Programmes were downloaded and coded. LinkedIn was used to facilitate communications and improve access between this researcher and students while on placement. Of particular importance was the use of Student Reflective Logbooks with entries covering 16 weeks were also used to supplement student and employer accounts.

The Actors Involved in the Internship/Placement Routine

Three actor groups and their potential dialogical exchanges within the ostensive-performative aspects of routines were targeted. Academic institutional actors (circa 16 actors), employer actors (circa 56 organisations) and student actors (circa 130 interns) involved in the internship/placement routines i.e. crossing the theory-practice divide represented the context were included. Onsite and follow-up interviews with student actors in relation to their experiences with employers and academic institution as they lived it were conducted. Students were tasked with completing reflective logbooks and separate reflective projects providing multiple sources of data and was used to analyse their role in and perceptions of various macro and sub-routines mainly from (but not exclusive to) a micro-actant perspective. Interviews were conducted with employers directly responsible for managing student actors on site. As data collection continued a distinction relating to ‘macro-employers’ as actors who understood the inter-organisational aspects of the routine was required due to the shortfall in understandings of ‘micro-employer’ as actants relating to the internship/placement programme as a whole. The Internship/Placement Officer, Academic Manager, Academic Mentors, Careers Service and Internship Quality Assurance Officers linked with the internship routine were also interviewed. This data took on many forms including unstructured meetings, informal conversations including anecdotal hallway comments recorded and captured in extensive field notes. As noted above documentary evidence linked to human actors and sub-routines were heavily relied on. Artifacts, also understood to embodying agency, provided insights into the internship/placement environment at a macro governmental policy level.

Respecting Sociomateriality & Agency

Our methodological contribution can be seen in addressing identified shortfalls in previous empirical research in routine theory. Routines, consistent with actor-network theory (ANT), where both people and objects informs our focus on dialogical exchanges leading to action underpins routine dynamics. Feldman & Pentland (2003) argue that there is a lack of a focus on agency. Orlikowski & Yates (2002 p.648) draw attention to the role of human actors “*in shaping the temporal contours of their lives, while also acknowledging the way in which people’s actions are shaped by structural conditions outside their immediate control*”. As called for we respect sociomateriality and agency extending to both humans and non-humans the potential to impact on action (Pentland et

al., 2012 p.3). We provide a more complete methodological approach balancing potential problems with an over emphasis on observational data and addressing what Feldman & Pentland understood as a problem with the absence of observational data in empirical research (2003 p100). With the inclusion of human actors routines become dynamically '*richer phenomenon*' positioning research as 'dynamic' (Empson, 2001). As can be seen here organisational routines allow for multiple levels of analysis within its conceptualisation.

The Challenges of an Inter-Organisational Multi-Level Analysis

Firstly, research on internship/work placement also argues for a processual inter-organisational context (Liu et al., 2011; Narayanan et al., 2010) to gain a full understanding of how internships/placement operates. This context was suggested by the combined theories of modal knowledge production and density of communications (Gibbons et al., 1994; Huff & Huff, 2001). Empirical routines research has failed to tackle the nature of inter-organisational routines (Zollo et al., 2002) and the interactions central to knowledge creating that it suggests. This research's conceptual and methodological contribution is to understanding routines across organisations. Secondly this research aimed to contribute to our understanding of multi-level analyses. Pentland et al's (2012) generative model followed here "*directly links micro-level actions within routines to the macro-level dynamics of routines*" (p.6). Elsewhere it is argued that by connecting individual activities to organisational levels we amplify knowledge (Nonaka, 1994; Nonaka & Takeuchi, 1995) and contribute to societal level knowledge production (Gibbons et al., 1994; Nowotny et al., 2001). Feldman adds what Nonaka understands as happening across a hierarchy she argues is happening within a routine (Feldman, 2000). We argue that to understanding knowledge creating a multi-level inter-organisational perspective of routines is required. Particular care was taken here to collect data at multiple levels of analysis, across multiple sites to tackle noted shortcomings in previous research (Empson, 2001; Salvato & Rerup, 2011). It is this approach that caters for the problems of granularity and combinatorics (cf. Becker & Lazaric, 2009).

Data Analysis

Dialogue within Ostensive & Performative Aspects of Routines.

Feldman (2000) provides a framework for data collection and analysis in the context of identifiable routines. Her paper discusses college housing routines and the stages outlined have been relied on here. An internship/placement macro-routine was selected to inform knowledge creating. The inter-organisational routine (across both organisations) and internal sub-routines as subjectively identified by actors were focused on for data collection and coding purposes. Sub-routines emerged from the data and actor's subjective perceptions and understandings were of particular interest. Within the context of identified sub-routines 'actors' including artifacts were used to gain an understanding of dialogue in action. Data was coded using the constructs of the ostensive aspects of routines; referring, guiding and accounting, and the performative aspects; creation, maintenance and modification (Feldman & Pentland, 2003). Data on dialogical exchanges were coded under actors, artifacts and imaginal others (Tsoukas, 2009a). Coding was facilitated using Nvivo 9 in accordance with the iterative approaches recommended in recent qualitative research using computer assisted qualitative data

analysis (CAQDAS) procedures (Bazeley, 2007a, b; Hutchison, Johnston, & Breckon, 2009; Saldaña, 2009). Themes were induced from the data. Vignettes were prepared and comparisons within and between sub-routines were sought out as suggested in previous research on generative models of routines (Pentland et al., 2012; Pentland et al., 2009). The first stage was to identifying how the actors referred to routines they experienced. More detailed descriptions of how actors were guided within and used routines to account for their actions were written up. Descriptions, using vignettes, under the headings artifacts, imaginal others and actors were expanded on. Jarzabkowski, Lê and Feldman (2012) developed vignettes as a means of representing different events but also that different vignettes might not necessarily follow linear patterns but may well be interdependent. This approach was taken here so as to prompt the emergence of rich comparisons and help to tell stories around, documents and artifacts. Data was organised around specific themes, routines and prominent dialogical exchanges. As new data was added in NVivo 9 coding progressed from simple descriptive codes to theoretical codes, which served to underpin and support extensive iterative memo writing and resultant vignettes (Bazeley, 2007a, b; Saldaña, 2009). As theoretical coding became more mature recurring themes and categories emerged. Memo writing allowed for cross-case comparisons which in turn enriched and informed the vignettes further. Differing actor accounts in relation to similar artifacts and imaginal others were of particular interest enriching descriptive vignettes and facilitate theory building on dialogical exchanges.

Findings

The findings here focus on the dialogical exchanges with artifacts and imaginal others as illustrated in Figure 1. The conceptual framework evolved during data collection and analysis. In accordance with previous literature the coding for artifacts (Dialogical Exchange 2) was connected to the ostensive aspect of maintenance while imaginal others (Dialogical Exchange 3) reveal articulations of schemas associated with the abstract ostensive nature of routines. This compliment coding process validated the consistency within our combined conceptualisation framework for knowledge creating i.e. dialogical exchanges within ostensive-performative aspects of routines allowing us to argue its robust nature as supported by substantive data.

Artifacts in Dialogical Exchanges

Artifacts were found and coded for across all phases of data collection including pre-placement artifacts such as employer job specifications, student curriculum vitas, academic quality assurance forms, standards and guides (Stage 1). Placement artifacts were also coded for and mainly included specific artifacts related to the multiple employer sites such as marketing, financial and project management materials and standard operating materials (Stage 2). The post-placement artifacts included student reflective logbooks (Stage 3). Additional artifacts not specific to any stage of the placement cycle mainly focused on industry level policy documents used in dialogical exchanges across the internship/placement macro routine. On-site interviews revealed how artifacts guided action and allowed actors to account for their behaviour. Standard operating procedures, CV's, Employer briefs and job specification artifacts (all Stage 1 artifacts) could be linked directly with specific forms of student action. The internship/placement officer relied heavily on reports, artifacts and industry documents to

account for changes to how the placement routine was managed and explained performances and actions i.e. when securing interviews for students.

Stage 1 - Artifacts and the Recruitment & Selection Sub-Routine: Prior to the involvement of students, the internship/placement officer asked employers to create job specification or 'job specs' outlining roles and responsibilities. Alongside this, some employers developed and utilised recruitment brochures reflecting their organisational values and expectations. The job spec was later distributed to students. The programme had no standardized pro-forma for these artifacts and employer responses varied from simple emails to comprehensive job specs, recruitment brochures and application forms (most notably found in the Big 4 accountancy firms with established and resourced recruitment and selection processes) outlining tasks and activities. A fund manager in a blue chip financial services employer discussing the role of the job spec and its content noted its strategic importance in explicitly stating the importance of having excel skills for the day-to-day reconciling of trades and pricing funds. This ensured that both the internship/placement officer and students alike would be guided by the criteria.

"It is on the job spec for us that they have good excel skills all of our reports ... can be run through excel and everybody runs them through excel. We're basically reconciling trades So, if you [the intern] can actually build formally into it, it helps you."

(Source: Placement Cycle 2, Phase 3 Interview - Fund Manager, 2nd June 2010).

The internship/placement officer explained that either limited or highly-detailed content would serve to under-sell or over-complicate the required roles and responsibilities influencing student interest and resultant action in the application process. Strategically, she expressed concerns when asking smaller employers to commit time and resources to even the shortest of job specs, let alone additional recruitment material, as for many firms this was an onerous commitment of resources. Attempting to find a balance and negotiating for internship/placement positions often required actions to set aside requirements for job specs let alone additional recruitment artifacts. In response to the 'job spec' students developed and submitted their Curriculum Vitae (CV), more often through the internship/placement officer than directly to employers similar to a commercial recruitment process. CVs often accompanied applications forms and reflected student's values, interests, personality and skills or VIPS (*Source: Stage 1 of Placement Cycles 2, 3 & 4, direct observation & interviews Career Guidance Counsellor*). The Career Guidance Counsellor used samples to illustrate poor quality CVs discussing how employers use CVs to assess if students match organisational values and determine if they have required skills and interests. While commenting on the job spec and recruitment brochures, the Career Guidance Counsellor explicitly noted how students should interpret employer requirements so as to guide actions in developing CVs.

"[Be] adaptable and employers don't want one trick ponies and you need to know yourself. What motivates you and using the VIPS [values, interests, personality and skills] to answer the question and go through each one. Turn the VIPS model into questions that an employer would ask in the interview from the employers perspective".

(Source: Placement Cycle 2, Phase 2, Career Guidance Counsellor, Placement Class 9th Dec 2010).

In addition when developing their CV, the Internship/Placement officer emphasised the need for students to think in the long term about employability and employer expectations (*Source: Placement Cycle 2, Phase 2, Placement Class, Non-Participant Direct Observation, February 2010*). A poor CV, subjectively assessed by the

Internship/Placement Officer and/or employer, would most likely have stymied a call for interview. Presenting weak candidates for interview would have a long term impact on employer relations with the internship/placement programme. Without the CV, and without it meeting a subjectively arrived at quality standard, students would not progress beyond the call for interview. Thus the presence and quality of the CV artifact had a significant impact on potential action.

Stage 3 - Artifacts and the Academic Quality Assurance Sub-Routine: The internship/placement programme provided reflective logbooks to all students. Students submitted their finalised reflective logbooks as they transitioned back from a 'practice' environment into their roles as students in the 'academic' environment. Guidelines prompted students to reflect on experiences. Weekly and monthly entries on day-to-day practices and pattern of activities were encouraged. Students shared their logbooks with employers on a weekly basis for sign-off and employers could review and contribute to student entries. This served to facilitate engagement with the specific internship/placement objectives. This routine ensured academic integrity and quality assurance for students toward academic credit. The logbook served to draw together the internship/placement programme's partners, making space for reflection on the different goals and objectives and specific nature of the macro-routine. The logbooks academic role upon completion guided both student interns and employer actions. Without the logbook, the programme's academic quality could come into question, risking the award of academic credit. Students, in their interviews, discussed the issues of academic credit. Without this many would not engage with their employer post-internship/placement unless they were doing further research work with that employer. This suggested that the need for academic credit in the internship programme prompted engagement and in turn action. The internship/placement officer and academic head of programmes then used the logbook artifact to sanction academic credit. Without the physical presence of the logbook credit was not awarded preventing student progressing in their studies. Theoretically employers would review entries for reasons of commercial sensitivity however evidence suggested that reviewing and signing of logbooks was haphazard and erratic suggesting that the vague purpose of reviewing. The dialogical exchange facilitated by the logbook in this instance was not found to be central routine enactment.

Imaginal Others in Dialogical Exchanges

This section looks at how 'imaginal others' (Dialogical Exchange 3) which emerged during data collection informed action. Evidence of organising for action, using imaginal others, was found in dialogical exchanges. Each dialogue reveals actors intent across the three stages of the routine.

Pre-Placement Stage - Imaginal Others & Internship Classes: Data from internship/placement classes informed our understanding of CV & interview preparation sub-routines and provided insights into two real other-real other dialogues; the internship officer with student actors and internship officer with macro-employers. At this stage the labels, representing sensitiveness to others of 'the employer' and 'the student' were prominently represented. These illustrated stereotypical employer expectations from stereotypical students (*Source: Placement Cycles 2,3 & 4*) in the data. The 'employer', 'company' or 'organisation' expectations were used to guide students preparing their CV artifacts to reflect values and expectations of 'the employer' were used for interview

preparation sub-routines. This context presented complications for new actors such as students who without an inherited background were tasked with learning new schemas guided by imaginal others relating to the scope, roles, responsibilities and identities to develop the CV artifact, secure and build interviewing skills and achieve success in the recruitment and selection sub-routine.

During-Placement Stage: Internship/Placement Data: Data from employers (*Stage 2, Internship/Placement Cycle 2, 3 and 4*) reflected differences in perceived identities of the student actors. Some employers referred to the students as ‘employees’ being no different to others, while some used labels such as ‘interns’ and ‘student on placement’. This mirrored how students perceived their own roles reflecting an insight into the sub-routines they referred to and used to account for actions. This reflected a long term versus short term perspective of the macro-routine as perceived by employers and students. Being just the ‘student on placement’ resulted in students taking only immediate responsibility for tasks whilst students as ‘employees’, found in many accountancy placements resulted in longer term engagement beyond the immediate internship/placement. The data collected illustrated how student actors interpreted the needs of the stereotypical ‘employer’ actor. On-site interviews illustrated their perceptions of what ‘the organisation’ might think of a repertoire of actions within the organisational sub-routines. Alongside dealing with immediate superiors in the course of their daily work they verbalised their relationship with ‘the employer’ and/or ‘the organisation’ as an imaginal other. Within the accountancy based employers in the data set the imaginal other of ‘the profession’ was revealed. This contributed to how students perceived the accountancy sub-routines in the long run toward trainee contracts and future employment. Notable absences, in other sectors, in referring to the ‘profession’ or the ‘organisation’ and thus long term perspectives guiding and accounting for action could be seen in data collected. This absence appeared in less routinised internship/placements, functions or industries without professional qualifications i.e. emerging digital media.

Post-Placement Stage: Academic Quality Assurance Data: On the internship/placement routine level, ‘academic credit’ as an imaginal other guided actions in completing the reflect logbook artifact. With changes in the macro routine as a consequence of the recession the data across all internship/placement cycles illustrated students questioning the requirements and procedures for this document. What the ‘academic institution’ requires as well as the expectations of the ‘academic head of course’ and ‘placement officer’ guided the actions of the students.

Interconnected Imaginal Others and Artifacts Across Levels of Analysis:

The interconnected nature of artifacts and imaginal others informing action within dialogical exchanges was found. As noted the logbook was inherently connected to the imaginal other of academic credit. However at one pharmaceutical company, ‘interns’, referred to as ‘new employees’, were introduced to the job bag process a project management tool mainly used in graphic design roles (*Stage 2*). The job bag process was required in highly regulated pharmaceutical markets, and used to guide marketing initiatives in accordance with IPHA (Irish Pharmaceutical Healthcare Association) marketing codes of practice and standards. The strategic importance of controlling what

is released to the public, and compliance with ‘the industry regulator’ as an imaginal other illustrated how guiding and accounting for action across levels of analysis occurred:

“This has to go through the job bag process. So, the minute you start a brief, the cost of the item, say is like post-it pads, the folder has branding on it. So it has to go through. The brief, all the costings and then concept of what you want it to look like.”

(Source: Placement Cycle 1, Phase 1, Student Actor Interview, Niamh B, Oct 2009).

The presence of the job bag artifact was required for compliance with the marketing codes of practice. It contained two compartments for the conceptual and approval stages of the process (or project management and/or compliance sub-routines in Pharma A). The conceptual compartment contained artifacts such as project briefs, supplier quotes, notes, mock-ups, proofs for packaging design and promotional materials. The approval compartment contained reviews of copy and various sign-off sheets across marketing, compliance and finance managers. Various other shared items of importance were placed in the folder to guide the actions of those working on the project and facilitated consultation by other staff members ensuring transparency and accountability. This transparency, as required by IPHA and was reinforced in a hierarchical sign-off and approval process. IPHA could inspect the management of these projects and review the portfolio of artifacts in the ‘job bag’. The process of sign off on the design of post-its was dependent on the elements i.e. artifacts, being in place and involved an assessment of quality across multiple functions:

“He would say, would you start a job bag for me, so any design or brief would go in this job bag. And when we get the first kind of proof of it, what we think it’s going to look like, like with the post-its, or we think the post-its going to look like, this was put in the conceptual stage. And that has to be approved.”

(Source: Placement Cycle 1, Phase 1, Student Actor Interviews, Niamh B, August & Oct 2009).

Three quotes from suppliers were required at the beginning of the job bag process. Without these the process for compliance with IPHA marketing codes could not proceed.

“You have to get three quotes, and then the one with the best quote like the cheapest quote it is the business, but it depends also on like delivery times, and whether we’ve used a company in the past ... weather they are reliable or not, like sometimes they would give a really cheap price.”

(Source: Placement Cycle 1, Phase 1, Interview with Marketing Manager, Pharma A, Aug 2009).

Appropriate actions to obtain three quotes needed to be documented. This three-quote system or sub-routine within the job bag process project management sub-routine served to guide actions for the broader compliance sub-routine. The artifacts and imaginal others, including management and industry expectations, served to guide the new student actors in completing operational tasks. However the ramifications and failure to engage with the three quote system, the job bag and its compartments and the IPHA code of practice, representing imaginal others from different levels of analysis, had strategic consequences for the employer. It should be noted that Stage 2 sub-routines, while tenuously linked to the macro internship/placement routine had implications for the future employability of ‘interns’. Here operational objects took on strategic importance for an employer.

Actors Roles Enacting Routines & New Distinctions

This section considers the role of actors (Dialogical Exchange 1) within routines and how they arrive at new distinctions. All three actor groups held different perceptions and levels of commitment of what it meant to perform the macro internship/placement routine. The internship/placement officer’s perception of the routine was cyclical in nature as she repeated the patterns of actions and activities across the four cycles. She

perceived student actions today as having a knock on effect in subsequent cycles i.e. the actions of a student actor in an interview or at employer sites would impact on the future availability of internship places. Indeed she represented the only actor in the macro routine that engaged in real other-real other dialogues with all actor groups. Her central role thus became important in assessing the quality of dialogical exchanges she engaged in. The internship/placement officer's role was perceived by students as similar to a lecturing position rather than administrative reflecting differing imaginal others. This differed from the role the officer would describe for herself, as an 'intermediary' and/or a 'recruitment organisation'. This distinction in the data provided an insight into the internship/placement officer's perceived role of being responsible for sourcing all placements, and thus requiring a matching and selection sub-routine rather than the role of supporting intermediary for sourcing placements which might not require such a sub-routine. As the economic recession intensified, differences in the perceived 'imaginal other' as an identity carried with it perceived responsibilities and had real consequences for sourcing internships/placements. In subsequent cycles this distinction and efforts to clarify responsibilities for finding internships/placements was amended incrementally while substantively changing the role of the internship/placement officer. Student and employer actors represented a chronological linear understanding of the macro-routine as for many the sub-routines would only be experienced and performed once. Established employer partners, mainly those in the accountancy sector, perceived the routine as an extended recruitment and selection routine thus combining it with their internal organisational routines i.e. combination. This combination might not be strategic to the overall practices of the macro internship/placement routine i.e. this is a feature that can be found in the job bag example above. A particular characteristic of note is that student actors did not repeat the macro internship/placement routine and as new entrants in each cycle they were broadly unaware of 'how things are done', unencumbered by an 'inherited background' (Wittgenstein 1979, p.94 cite in Tsoukas, 2009b) but also impaired in understanding a clarified routine. Learning an 'inherited background' and articulating new distinctions, in the role of the internship/placement officer, using imaginal others is important within the context of dialogical exchanges. Data clearly indicated a lack of engagement from student actors during the internship/placement classes (Stage 1, Phases 2, 5 & 8) and as reflected in employer comments on poor quality of CVs and interview skills. The lack of engagement was mirrored in the absence of dialogical exchanges with the placement officer, poor attendance at placement classes and confused understandings of roles i.e. imaginal other, as they facilitate actions and enactment of sub-routines.

Discussion

So how can actors in dialogical exchange with artifacts and imaginal others influence action and contribute to our understanding of knowledge creating? How these contribute to action underpins what we argue as the basis for knowledge creating. Research on the roles played by both artifacts and imaginal others have followed different and separately distinct paths. By shifting our attention toward dialogical exchange connected to action we bring these research threads under one umbrella to further our understanding of generative routine dynamics. How actors, artifacts and imaginal others in dialogical exchanges inform action as a basis for knowledge creating is now discussed.

New actors when performing routines go through a learning process. The student actors as new entrants to sub-routines were found to embark on a process of learning using available resources. Their evolved understanding of the role of the internship/placement officer in the matching and selection sub-routine, from a student perspective represented their ability for guiding and clarification of future actions to be taken. Dialogical exchange within the abstract or ostensive description of routines provides an explanation for how imaginal others contribute to emerging new distinctions. Student actors perception of routines is informed by the available imaginal others. The roles artifacts such as CVs and job specs codify their perception and understanding of these routines informing action.

How can artifacts in dialogical exchanges influence action and contribute to our understanding of knowledge creating? The nature of core artifacts, used by all actors, in dialogical exchanges is found to impact on action. The presence of an artifact informs sequential actions combining different sub-routines. In the pharmaceutical firm the job bag artifact and its constituent artifacts, used by all actors in that context, was integral to ongoing enactment of the project management, marketing and financing sub-routines. The absence of a CV prepared by student actors during the CV & interview preparation sub-routines consequential impacted on employer's recruitment and selection sub-routines. The internship/placement officer's matching and selecting sub-routines would not be enacted without the CV artifact. By comparison the absence of a job spec artifact, again used by all actors involved, might not impair enactments whereas the absence of a CV did. This raises a distinction between the two. Whereas both artifacts are relied on to guide and account for action the absence of a job spec does not necessarily impair enactment of subsequent sub-routines. Similarly without the reflective logbook students would not proceed into their final year of study preventing expected sub-routines from being enacted by the academic head of programmes i.e. registering student for a course of study. While the reflective logbook was also used by all actors its relative importance varied. The haphazard and erratic involvement of employers with regard to the reflective logbook suggests a diminishment of importance of this artifact in the internship/placement routine from an employer's perspective. Therefore the absence of dialogical exchanges involving core artifacts can be seen to impact on and alter action. Alternative sub-routines are relied on to provide extra guidance i.e. in CV development and catering for repeating course work.

The quality of core artifacts in dialogical exchanges was also found to impact on action. A poor quality CV would prevent progression or enactment of subsequent stages the internship/placement officer's matching and selection and employer's recruitment and selection sub-routines. In contrast the job spec, logbook and job bag quality, used by all contextually linked actors, were assessed on the basis of 'absence' or 'presence' whereas their 'quality' in terms of content did not prevent the enactment of subsequent sub-routines. Indeed the quality of the job bag arguably slowed down action. This suggests something qualitatively different between these artifacts embodying imaginal others and how they guide actions taken by actors within routines.

Many imaginal others within dialogical exchanges were identified as guiding action within subjectively identified sub-routines. The imaginal others of 'the student', 'the intern' or 'the future employee' has clear implications for progressing employer action, the form this action took, and the tasks assigned to the students by employers. This

illustrated a perceived short term versus long term utility of the macro placement-internship routine as understood by employers. This distinction impacts on enacting the repertoire of sub-routines. The 'intern' or 'student' abstractions were often used and associated with the enactment of short term sub-routines whereas 'future employees' reflected a long term recruitment and selection sub-routine influencing how routines were referred to and they guided future actions. Use of either sets of imaginal others was evident in communication to all staff resulting in organisational actions being easily altered illustrating how imaginal others in dialogical exchanges influence action. The abstract nature within the ostensive aspect of the routine, as perceived and articulated by different actors, results in new distinctions informing action.

In relation to the job bag artifact and its connection with compliance as an imaginal other we see how artifacts in conjunction with imaginal others i.e. the sociomaterial assemblages, coalesce to guide actions, facilitate accounting for actions as actors refer to the 'job bag' sub-routine. Similarly the reflective logbook was inherently linked with academic credit as the imaginal other. Whereas the completing of the logbook artifact reflected the performance or goal of the sub-routine it was guided by the ostensive aspect i.e. 'academic credit'. The recruitment and selection sub-routines were inherently linked to various artifacts. The subsequent treatment of the macro placement routine appears to influence the importance placed on artifacts in dialogical exchanges. Arguably these cannot be separated but are interconnected and coalesce to inform action. The findings illustrate the importance of core artifacts and core actors as it is their function of mediating that underpins dialogical exchanges and establishing repertoires for action. For this reason core artifacts and core actors are of greater interest in guiding and clarifying action. While the nature of core versus peripheral artifacts and actors have received some marginal attention in the routines literature, how they guide action must contribute to our understanding of how knowledge creating.

How routines with an absence of core actors or artifacts and a greater reliance on the quasi-dialogical processes using imaginal others impacts on guiding action requires further investigation. This absence here is compounded by the presence of new entrants without an inherited background and productive dialogue (Tsoukas, 2009b). Student actors have entered social media marketing internships where there are no and little established routines. Absent or poor quality guidelines, patterns of work or established artifacts might impact on the density of dialogical exchanges. Student actors were pervasive in terms of their non-engagement which was obvious in the data across the four cycles. But engagement, and thus dialogical exchanges were found when core actors and core artifacts were introduced (job specs, CV, the logbook, the job bag and activities of the core placement officer that all could engage with). This suggests the importance of materiality for guiding within routines (Feldman & Orlikowski, 2011). Moving from full absence to full presence could reveal an increase in the density of dialogical exchanges increasing 'productive dialogue' (Tsoukas, 2009b) and the development of inherited backgrounds for the new entrants. The logical extension is that as artifacts and imaginal others coalesce appear, meditation and productive dialogical exchanges would begin increasing the density of communications. At the extreme end the more core artifacts and core actors and thus density of dialogical exchanges greater clarification in articulated schemas is argued. This in turn establishes repertoires for actions.

We argue that ‘clarification’ from dialogical exchanges as a basis of knowledge creating requires further research. Feldman & Rafaeli (2002) outline how routines make ‘connections’ which in turn enable ‘shared understandings’ about ‘what to do in a particular circumstance’ and ‘why some actions are appropriate’. This in turn helps to maintain the ‘ability to coordinate and adapt’. The clarification of routines is of particular interest for new entrants such as the students in the internship/placement routine (similar to those in Residential Life). Without an inherited background dialogical exchanges clarify repertoires of actions. This logic underpins the findings that the clarifying nature of routines in guiding action and allowing actors to account for their past and present actions. The more connections and shared understandings present in a context relative to another contribute to the generative emergent nature flowing from the density of dialogical exchanges. This provides greater clarification toward action and in turn knowledge creating.

Conclusion

We depart from knowledge transfer and its multiple threads of research in favour of as a more appropriate and comprehensive processual approach to knowledge creating. This shifts the focus from transfer and creation to knowledge creating. We contribute to theory building by combining two theoretical approaches. The explanatory power of the ostensive-performative aspects of routines, understood as a generative system, is enhanced when we incorporate a dialogical approach to new organisational knowledge. Our contribution is to reveal new relationships and connections between these two theories and to operationalise the ostensive-performative theory of routines from a dialogical perspective. We illustrated stark similarities between the two theoretical approaches, both theoretically and from supporting empirical data, suggesting an inherently robust theory for knowledge creating. This approach not only builds on the lack of attention in routines given to agency (Feldman & Pentland, 2003) but also tackles the recent call to focus on action (Pentland et al., 2012) as a basis of understanding the generative nature of routines. Through dialogical exchanges we provide a comprehensive understanding of the connections and understandings (Feldman & Rafaeli, 2002) relating to artifacts, actors and imaginal others. We gain a better understanding of knowledge creating as these coalesce and as repertoires of actions are clarified.

We also contribute to a better understanding of generative routine dynamics provides a more comprehensive approach to knowledge creating. Substantiated by empirical data our results show an inherent consistency within our conceptualisation supporting our emphasis on dialogical exchanges leading to action at the centre of routines theory. The role of core actors and artifacts has been shown to impact on the density of dialogical exchanges (Gibbons et al., 1994) and ‘productive dialogue’ (Tsoukas, 2009b) mediating and clarifying action. The importance of respecting sociomateriality and agency formed the cornerstone of data collection. In the absence of dialogue with artifacts and real others routines lack clarity leaving actors to rely on their own subjective articulations, informed by schemas and imaginal others. Here the opportunity for meaningful communications and productive dialogue is arguably impaired. By focusing on how imaginal others inform action we can better explain links between micro-level actions within routines to macro-level dynamics. Evidence from multiple levels of action, represented as imaginal others, was provided supporting this bottom up approach. While action at the centre of

generative routines requires further conceptualising we argue for the use of dialogical exchanges.

Our methodological contributions spoke to the challenges of multi-level research and the absence of research on inter-organisational routines. The internship/placement routines was previously identified as being an under researched context (Narayanan et al., 2010). It provides us with an accessible context for understanding a macro routine as it influenced actors in and moving to and from different organisations. It was this level of granularity that enhanced the richness of the data required for studying knowledge creating. The focus on imaginal others informed by schemas revealed abstractions, within the ostensive from multiple levels provided insights which allowed us to have a more comprehensive overview which might otherwise have been lost.

This processual approach considering dialogical exchanges associated with action facilitated the emergence of clarification, consistent with the dualist-dualism debates (Farjoun, 2010; Feldman & Orlikowski, 2011; Pentland et al., 2012). While Pentland et al (2012) have gone a long way to highlighting action our evidence showed that both imaginal others and artifacts, within dialogical exchanges coalesce (as assemblages) to contribute to this action. Our data supported the interdependence of dialogue and routines as a dualism and the interdependence of artifacts and imaginal others in relation to action contributing to the cognitive versus behavioural perspective on routines (Feldman & Orlikowski, 2011). We argue the case for dialogical exchanges at the centre of routines. We assert that dialogue must occur within routines but that routines cannot exist without dialogue. We suggest the emergence of generative routine dynamics as a separate distinct focus within routines theory and by extension a potential dominant approach to knowledge creating.

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