

Mimesis: learning through everyday activities and interactions at work

Stephen Billett, Griffith University, Australia

s.billett@griffith.edu.au

This paper provides an elaboration of mimesis to propose that human resource development (HRD) practitioners need to reconsider the potential of workers' learning through every activities and interactions at work. It proposes that the majority of learning across working lives likely occurs outside of being mentored, taught or guided through training programs by others (e.g. teachers or experienced co-workers etc) and their pre-determined intentions for what is to be learnt. Yet, many, and perhaps most, explanatory and procedural accounts emphasise these kinds of intentional interventions by others (e.g. educational and training programs), more than workers' actions as learners in and through their everyday work activities and interactions. Therefore, it seems important for HRD that these everyday learning processes to be understood more fully. Here, an account is advanced here of how workers' learning through everyday work activities and interactions, both remote from and when engaged with others, arises through mimetic processes (i.e. observation, imitation and action). This elaboration sets out some premises that might comprise the foundations for an account of workers mimetic learning in the circumstances of work, in ways that seems relevant to HRD practices and practitioners.

Learning through work

Workplaces are where much, if not most, of the learning for work and working lives, and is therefore central to human resource development (HRD). Over the past two decades, when interviewing workers from a range of occupations about how they learn through and for work, consistently they described it being premised upon: i) engagement in work activities, ii) observing and listening and iii) 'just being in the workplace' (Billett 1994, 2001, 2008). These findings were recently supported again in national study of how workers maintain their employability and secure advancement across their working lives (Billett et al., 2014). These premises for building and sustaining the kinds of capacities that are the focus of HRD practices

seem distinct from those usually associated with intentional learning interludes in educational institutions or in training programmes and centres. Instead, most markedly, they are characterised as being initiated and realised by learners, themselves, rather than through interventions such as training, training programs or mentoring by others that are the focus of much (HRD) practice. So, we need to know more about these learning processes and how they might be utilised more fully and enhanced to address workers' and workplaces' needs and be incorporated in and promoted through HRD practices. The first of these (i.e. engaging in work activities) can be explained through socio-cultural constructivist (Cole, 1985; Rogoff, 1990; Scribner, 1984) and cognitive accounts (Anderson, 1982; Sun, Merrill, & Peterson, 2001) of the process and outcomes of individuals' engagement in goal-directed activities that hold learning to be the legacy of such engagements. This explanation addresses not only the development of procedural capacities (i.e. ability to achieve work goals), but also conceptual (i.e. understanding) and dispositional (i.e. values and interest) capacities that arise concurrently (Gott, 1989), as they are all deployed and changed through these processes. The explanatory bases for why workers consistently referred to 'observing and listening' and, in particular, 'just being there' in workplaces are less readily identified. References by workers to observation and listening are often associated with understanding goal states (i.e. what has to be done, achieved etc.), overall procedural responses (i.e. how it might have to be done) and how tasks are to be completed (i.e. appropriate outcomes). Therefore, if these contributions are as effective as worker-informants report, work-related learning realised through observing and listening is central to understanding and enacting (i.e. learning) work-related activities. This case is seemingly never more so, than when it is also taken as comprising supporting processes of individuals engaging in and securing increasingly mature approximations of observed goals. That is the progressive processes of developing skillfulness (Gott, 1989). These learning processes are central to the project of HRD. Yet, rather than being the product of training programs and the like, this developmental process necessarily positions 'observing and listening' as being an active learning process that is initiated and exercised by those who are learners. Similarly, informants' references to 'just being there' are associable with active engagement contributions to their thinking and acting (and learning) furnished by the social and physical environments in which these activities occur, as has been long suggested in anthropological accounts (Lave, Murtaugh, & de la Roche, 1984; Marchand,

2008; Pelissier, 1991). All of this suggests that as workers participate in active meaning-making processes when engaging in work activities and interactions learning of the kind prized by HRD practitioners arises. As such, these processes warrant a more comprehensive elaboration than is provided through informants' self-reports alone. Instead, there is a need for a more informed and comprehensive explanatory account about how processes such as observation and imitation (i.e. mimesis) shape this learning, and considerations of how these can be embraced by HRD practitioners.

The explanatory concerns relevant to HRD here are at least threefold. First, elaborating further the processes through which contributions from physical and social environments (e.g. workplace or training settings) shape individuals' learning. This elaboration includes accounting for how these contributions are mediated by individuals themselves, as well as inter-personally by more informed social partners (e.g. supervisors, trainers). Second, contributions from anthropology and advances from behavioural, developmental and cognitive science together provide new concepts and evidence informing these processes of human learning and development that are relevant to the HRD project. Hence, a consideration of mimesis seems timely and can be used to inform what occurs in work settings by drawing upon these new concepts and insights. Third, given that considerations of learning of socially-derived knowledge (such as that required for occupations) are usually associated with close personal interactions with more informed partners, the processes of learning occurring outside of training program and mentoring arrangements needs to be understood, and, where appropriate, brought more centre stage when considering how learning through for and through work progresses (i.e. processes central to HRD).

There is also a range of procedural considerations that are relevant to HRD. These extend to how HRD practices can more effectively support and promote workers' learning outside of those characterised by close guidance and interactions with others. This consideration includes how worker-learners might be prepared for, engaged in, and monitored and guided when learning without close interactions by more experienced partners. Not the least of these imperatives is to re-consider an emphasis of taught processes and practices. Within contemporary 'schooled societies', there is an orthodoxy and privileging of direct guidance by others (as in teaching) that may diminish the legitimacy and standing of individuals' learning

outside of circumstances where they are taught, guided and supervised, which extends to labelling as 'informal' learning (Marsick & Watkins, 1990).

In advancing its case, this paper elaborates the processes of learning through observation and imitation through and for work and promoting the concept of mimesis, through drawing on contributions from a range of disciplines. The case progresses by, first, discussing - everyday learning and mimesis – and how much, if not the majority, of learning occurs across individuals' lives outside of direct interpersonal interactions with more informed partners. Next, the paper draws upon historical, anthropological and recent accounts from behavioural and cognitive science to elaborate more fully, the nature and effectiveness of mimetic bases of learning, including intra-psychological mediation (i.e. that within the person). In conclusion, and in setting out what might comprise foundations for a theory of mimesis at work, three sets of premises for HRD practice are advanced through accounts of: i) processes, ii) outcomes and iii) procedural implications for promoting learning in and through the circumstances of work, all of which seem relevant to HRD.

Everyday workplace learning through mimesis

When consideration is given to understanding and promoting human learning associated with realising worthwhile personal or social goals, such as paid work, there is a tendency to look towards how this learning can be promoted inter-personally. That is, how more informed social partners (e.g. teachers, experts, more experienced partners, supervisors or co-workers) can act to assist, support and guide individuals' learning. Such considerations are particularly emphasised and exercised in the contemporary era where schooling and teaching is privileged and practices within educational institutions are legitimised. References to 'schooling', of course, extend beyond those associated with compulsory education (i.e. primary and high schools) to what occurs in colleges, universities, training rooms, corporate development programs etc where intentional learning is supported by specific educational intents, processes and instructors of some kind. The inter-personal emphasis in schooling provisions is through both unidirectional transmissions (e.g. presentation) and individuals' bi-directional interactions with others (e.g. interactions with other workers and trainers) (Valsiner & van der Veer, 2000). Even efforts to promote individuals' self-

directed learning are often advanced through engagement with others whose role is primarily about promoting and guiding others' learning, variously titled as facilitators, coaches, mentors etc.. Interestingly, the exceptions here, such as engagement in more solitary critical reflection or reflexivity, tend to emphasise higher-order learning outcomes enacted intra-personally (i.e. within individual) through introspection, albeit often framed by particular purposes (e.g. reflection on practice). However, importantly, the worth of inter-personal activities and interactions is not questioned here. Given most of what needs to be learnt arises from the social world, and learning for occupations is no exception, close guidance by more informed others can be very helpful. Indeed, independent epistemological learning adventures may be unhelpful, inappropriate or even downright dangerous. Certainly, accessing social sources of knowledge through more expert or experienced partners is helpful and, at times, essential, because the knowledge would otherwise not be learnt, and is central to much of practice with HRD activities. This need was reinforced in the recent project on workers' learning to sustain employability in which 'learning through everyday work – individually' was ranked the most preferred, it was followed by 'learning through everyday work – supported by educational interventions' (Billett et al., 2014). The contemporary apprenticeship approach to learning is also premised on the guidance of more expert and experienced others (Billett, 2011a; Rogoff, 1990), for instance. So, it is certainly the case that much of human learning arises from circumstances where others tell, teach, instruct, demonstrate, or otherwise guide individuals' learning inter-personally, and learning for and through work are no exceptions.

However, human learning of the kind required for effective work is not restricted to circumstances where it is directly and intentionally mediated by others. Instead, it is ongoing across our lives as we continuously engage in everyday conscious thinking and acting, and cognitive processes (i.e. micro-genesis or moment by moment learning) occurs both within and outside of circumstances of direct guidance. Indeed, much, and perhaps most, of learning across individuals' working lives arises in circumstances not directly and immediately shaped by intentions of and interactions with other workers, and this appears to be the case across human history (Billett, 2014b). In an early explanation, Baldwin (1894) referred to children's observational learning leading them to identify and understand inconsistencies and ambiguities in what the social world suggested to them. That is, they engaged actively and brought critical capacities to

how they construed what they experienced. Similarly, children in the second month of their lives are held to demonstrate versatility in imitation (Inhelder & Piaget, 1924). Learning the capacities required to be effective in schooling also arises in children before the age of five in the absence direct teaching and even parental engagement – realised through mimesis: observation and imitation (Kosslyn, 1980). The point here is that this interdependent form of learning is not an adult trait, but seemingly a central process through which humans of all ages engage in learning through what they experience.

Indeed, Baldwin first, then Piaget and Inhelder (1924) and Vygotsky (Scribner 1985) proposed that as we think and act, we continually learn micro-genetically (i.e. through moment-by-moment processes) in response to what we experience. This response includes what we elect or are pressed to engage with, and how we direct our cognitive and sensory efforts and resources in these processes. Our responses and, hence, learning, are both shaped by and contribute to ways of knowing and knowledge that arise from our socially-shaped personal histories (i.e. ontogenies), in person-particular ways. So, rather than learning being something reserved for and privileged by experiences within educational institutions and training rooms, there alone through interpersonal engagements, it occurs continuously as individuals construe what is experienced and construct knowledge from those experiences micro-genetically. Moreover, rather than being a process of transmission, learning arises through individuals construing and constructing what they experience. This process has been described variously as securing equilibrium (Piaget, 1971), realising ontological security (Giddens, 1991) or maintaining viability (Van Lehn, 1989). Indeed, across human history, the process of learning culturally and socially-derived knowledge, such as that required for work, seems to have arisen through individuals' engagement in everyday practices, rather than being explicitly taught by others (Billett, 2011b). Indeed, before they existed and outside of 'schooled societies' there is consistent evidence that close interactions of the kind referred to now as teaching are quite rare and reserved for the kinds of learning that cannot be realised through individuals' action and discovery alone (e.g. Bunn, 1999), (Singleton, 1989). Historical and anthropological accounts consistently propose that much of the locus for this learning resides within those positioned as learners and that this is how human development has always largely occurred (e.g. Menon & Varma, 2010). As Jordan (1989) suggests:

It is clear that now and for a long stretch of our evolutionary past, the overwhelming bulk of behaviours, from feeding to grooming, is and has been learnt in this way (p. 931).

Yet, more personally-directed processes of construing and constructing knowledge receive relatively limited attention in the workplace learning literature. This is despite the personal mediation of what is experienced is probably the most common of learning processes (Billett, 2014a) and its reach likely extends to all circumstances and activities (including within HRD interventions and training programs). If nothing else, direct guidance occurs only relatively infrequently, whereas individuals are constantly engaged in conscious thinking and acting (i.e. learning micro genetically). Indeed, despite being a fundamental and salient learning process, mimesis (i.e. observation and imitation) rarely features in such accounts. Perhaps this is because in the current educational discourse mimesis is often seen as being associated with mindless mimicry, when it is far from that (Byrne & Russon, 1998; Tomasello, 1998). This view also says something about how processes for supporting adult learning and development have predominantly come to be considered primarily as being mediated by others. Yet, cognitive processes bringing about change (i.e. learning and or development) within individuals (i.e. intra-psychologically) are now widely accepted as orthodox within constructivist paradigms as being ongoing and active as individuals make sense of what they experience, consider and enact responses and then appraise the consequences. Not fully accounting for intra-personal processes of learning through work is particularly curious given the extensive literature from behavioural science whose theorisations inform mimesis (Byrne, 2003; Byrne & Russon, 1998; Tomasello, 1998). These accounts offer helpful concepts for understanding, explaining and, perhaps, promoting mimesis in adults as they engage in their paid work. All of these concerns are relevant and important for HRD practices, which need to be founded on informed accounts of human cognition and learning. Typically, distinctions in psychological accounts are those between how the mediation of the immediate social world (i.e. social constructivism) and individuals' socially shaped ontogenies (i.e. individual constructivism) shape that learning. There are also ongoing deliberations about the degree to which this constructive process is a product of the organism's (e.g. individual's) generation of knowledge from what is experienced (i.e. empiricists' view) and the extent to which organisms have such capacities as a biological legacy of evolution (i.e. the nativist view). Yet, doubtless few, if any, nativist accounts would

claim that specific forms of knowledge, such as those required for work, arise from biological legacies. So, the HRD project needs to be informed by the ways humans construct meaning.

Importantly, it seems that much of this learning process and its outcomes are person-dependent: shaped by earlier experiences and reconciliations of those experiences. The outcomes include personally-particular and possibly idiosyncratic orderings of knowledge and its representations by and within individuals. That is, a person-particular socially-derived ontogenetic development arises through individuals' experiences and processes of experiencing (Billett, 2009). This is not an account that positions the social and personal as being oppositional, rather viewing them as being relationally engaged. This learning is, however, directly mediated by individuals themselves, albeit set within and against the mediating milieu of the social world with its norms, forms and practices where it is experienced. Even for the most cosseted of children, ordered soldiers, tightly supervised workers and didactically taught students, learning is far from being wholly mediated by others. Whether expressed or appropriated without expression, these children, soldiers, workers and students' learning is mediated by how they construe and construct what is suggested to them. Yet, this proposition about person-dependence does not imply some form of 'anything-goes' individual constructivism or highly idiosyncratic epistemological adventures, although that might potentially occur. So, whilst being person-dependent, individuals' cognition is also shaped by sets of social norms, forms and practices in which they are immersed or saturated, as Gergen (2000) claims. For example, Harris (2007) suggests the mediaeval notion of Hell owed much to people's daily encounters with fire and burns. Social and brute facts such as these mediate individuals' conceptions and their learning (Billett, 2009). Yet, conversely, individuals' cognition is not a process of socialisation: merely replicating what is suggested by the social world. Not the least here, it is that this suggestion is not readily or unambiguously projected (Berger & Luckman, 1967). So, most, and perhaps the majority, of human learning likely occurs in this way and including through not wholly explicit means (Jordan, 2011) and those requiring directed conscious thought (Lakoff & Johnson, 1999). What is rendered seemingly unconscious becomes part of tacit knowing, and, possibly, ultimately intuitive acts. These capacities permit performance at work to occur without engaging conscious thinking and acting. Hence, much of what is experienced when walking, driving, talking et cetera is premised upon these kinds of capacities. Yet, these

activities are not enacted mindlessly, but make minimal demands upon conscious thinking processes, so that individuals may not be conscious of them. Much intentional and socially mediated everyday learning, such as that work, occurs in this way and outside of inter-personal interactions with close social partners. To understand more about human learning and development aligned with intentional and worthwhile purposes, such as those required for work and are the focus of HRD practice, necessitates considering the intra-psychological processes supporting that learning.

Mimesis and human cognition

As foreshadowed, a foundational and key process underpinning this ongoing learning is mimesis (i.e. the imitative representations of nature or human performance) (Jordan, 2011; Marchand, 2008; Reber, 1989) arising through observation, imitation and rehearsal. Mimesis is not only exercised extensively and continuously by humans, but is also the most common and enduring form of engaging with and responding to the environment across other species (Byrne, 2003). Whilst being personally mediated, it comprises a form of social engagement and learning that can be classified as socio-genetic – social bases for human learning and development. Because of the absence of direct interaction with teachers and other informed partners, mimesis is not privileged within the discourse and accounts of schooling or education. Indeed, there is a tendency in schooled societies for such a process to be dismissed as being inferior (e.g. informal, ad hoc etc.) because it is not guided by more informed (and teacher-prepared) partners (Billett, 2002). Within such a discourse, the term imitation is often associated with a low-order process of mimicking (Byrne & Russon, 1998) – the copying of activities without knowing how or why – than something requiring and being realised through higher-order processes. However, quite the contrary, mimesis requires abilities to understand the context for the action, and individuals placing themselves in the position of observed actors, and to generate and reproduce those behaviours, actions and practices with their own bodies (Reber, 1992). So, mimesis not only requires, but promotes higher-order capacities, and as Jordan (1989) suggests that:

To appreciate how pervasive and important this mode of skill and knowledge acquisition is in contemporary humans, we need only consider that all childhood socialisation, including the

acquisition of language and of the skills of daily living, depends on the ability to imitate and motivation to do so. This is particularly evident in childhood play [16]. In later life as well, most learned action sequences depend on behavioural matching: how to drive a car, how to give a lecture, how to behave at a cocktail party - for all of these activities the knowledge required to bring them off unproblematically is required through bodily imitation. (Jordan 1989: 931)

Anthropologists such as Lave (1988, 1990, 1993), Pelissier (1991), (Bunn, 1999), Marchand (2008) as well as Jordan (1989, 2011) have long emphasised the centrality of observation, imitation and opportunities for repeated practise as being essential for learning and remaking of culturally derived practices, such as those associated with paid work (i.e. occupations). Within anthropology, learning such practices is held to occur largely through processes of observation, mimesis and practice and almost wholly directed by learners themselves. These accounts do not make simple and unhelpful distinctions amongst thinking and acting, and learning. Nor do they make simple distinctions between the social and individual, instead seeing these contributions as being richly intermixed and intermingled. The absence of extensive direct interpersonal interactions in the majority of these accounts (Bunn, 1999; Gowlland, 2011) posits mimesis as being the most common learning processes occurring across human lives. Certainly, that occurring in and through work is no exception. Indeed, the likes of Bunn (1999) and Marchand (2008) suggest a range of learning progresses in this way, and in the absence of direct interpersonal guidance.

... most learning, of course, happens in the way that most humans learn their first language - on-the-job - in the process of living life itself. As an apprenticeship in living. (Bunn 1999: 74)

In describing the learning of capacities required for nomadic communities in Kyrgyzstan, Bunn (1999) refers to these as arising through the daily lived experiences, yet identifies one element as being particularly critical: learners' interest and readiness to engage actively and learn everyday practices. Marchand (2008) also emphasises the importance of this interest or agency in referring to apprentices needing to 'steal' the knowledge they require because it will not be taught or otherwise made explicit for them. Instead, their role is to actively and surreptitiously acquire this knowledge through observation and imitative action. (Webb, 1999) suggests the word apprenticeship is found within Latin – *apprehendere* – to seize, or lay

hold of, to seize with the mind, emphasising the active processes of human meaning making as is manifested in mimesis, rather than being 'taught' by a more experienced worker. More literally, in his study of Japanese pottery apprenticeships (Singleton, 1989) states the word for apprentice is *minarai*: one who learns by observation. He notes apprentices' learning is expected to progress without didactic instruction and be directed by apprentices' own interests, intentions and capacities. This learning is premised on individual experimentation and advancement and, yet, with the expectation that observation and imitation will progress in a way that does not interrupt or is separate from the ordinary processes of the workplace. There is even a term for this unobtrusive process of observation: *minarai kyooiku*, emphasising actions required by the apprentice to engage and learn in and through everyday work activities. As Singleton (1989) proposes, there are expectations that apprentices will understand, anticipate and respond to their master's needs without being told. All of these practices are required to be learnt, not told or taught. This kind of understanding or anticipation is analogous to ontogenetic ritualisation (Tomasello, 2004) – the process by which partners come to understand each other's preferences and purposes for engagement. Relatedly, Dewey (1916) holds there are quite distinct kinds of learning arising from living with others, rather than those arising through the deliberate education through schooling.

In the former case, the education is incidental; it is natural and important, but it is not the express reason of the association. While it might be said without exaggeration, but the measure of the worth of any social institution, economic, domestic, political, legal, religious, is its effect in enlarging and improving experience; yet this effect is not part of the original motive, which is limited and more immediately practical. (p. 6)

Yet, even in circumstances and occupations where intentional arrangements are organised to promote learning of particular kinds, such as in training programs, there is still a need for learners to observe, imitate and practice to learn what has been demonstrated and spoken about, and, then subsequently, come to practice independently. This is the case when learning to make Yurts (i.e. tents), eagle training (Bunn, 1999) and when direct inter-personal guidance is provided (e.g. master potter laying hands on those of the novices to show how to form a pot with their hands (Singleton, 1989)), and where guidance for apprentices is also provided through the verbalisation by experts as they enact work tasks (Gowlland, 2011). So,

mimesis is not restricted to circumstances outside of educational programs, and direct teaching and guidance, it applies both within and outside of them. For instance, Sinclair (1997) refers to the practice by medical students of using observation to identify conditions in people that they observe in public situations, thereby emphasising the practical importance of this process to both work and learning. So, in these accounts, the central elements that empower mimesis are learners' readiness, interest, intentionality and agency | engaging with and then rehearsing their capacities.

As noted earlier, workers consistently reporting learning occupational skills in workplaces and/or through the circumstances of work refer to analogous processes (i.e. opportunities to observe and listen, 'just being there', 'just doing it') (Billett, 2001). Moreover, analyses of baking apprentices' learning in their workplace (Chan, 2009) and other kinds of workers consistently report instances of how these processes are central to individuals' learning through work and in the workplace (Billett, 2006), often occurring outside of and away from the direct guidance and monitoring of more experienced co-workers. Importantly, beyond initial preparation for the occupation, many of these workers refer to similar processes of learning across their working lives (Billett 2014 et al). More widely, Iacoboni et al. (1999) propose that:

Imitation has a central role in human development and learning of motor, communicative, and social skills (1999: 2526).

Indeed, flexibility and variability in imitative action is common practice for humans as very young children (Hayne, 1998) and, then, in later in working life (Billett, 2001).

These accounts emphasise traditions and practices described largely from within anthropological and sociocultural perspectives. As such, they are concerned with the suggestion of the social world and inter-psychological processes (i.e. those between persons and the world beyond them), rather than intra-psychological processes (i.e. those within the person). However, elaborating a more nuanced understanding of mimesis and bases of its effectiveness and contributions to human learning and development necessitates going beyond description of inter-psychological processes. For instance, Iacoboni et al (1999) suggests that "the neural basis of imitation and its functional mechanisms are poorly understood" (2526), not the least because the processes securing the ontogenetic legacy (i.e. learning)

through observation and moment by moment learning (i.e. micro-genesis), such as imitation and introspection, are not easily accounted for within the kinds of studies mentioned at the beginning of this paper. Hence, it is necessary to look towards other disciplines and bases to inform both the processes and potency of these experiences. In particular, there is need to consider how the intra-psychological processes serve to enact and make these processes effective.

Intra-psychological contributions to mimesis

As noted, the processes of mimesis comprise more than mimicking: merely copying the actions of others without purpose or understanding. Instead, mimesis is premised upon and enacted through conscious higher-order processes such as monitoring, evaluating, identifying causal relations, analogy, and active cognitive processes including the generation of representations which are contemporaneously referred to as simulations (Barsalou, 2008). These cognitive processes require individuals to inquire, understand, piece together, extend, and to complete incomplete aspects of what is being observed and engaged with, based upon what they already know. This process is what Valsiner (2000) refers to as engaging their 'cognitive experience', and what (Gergen, 1994) proposes as drawing upon events from the past, and inserting them in the immediacy of the current moment to make sense of what is being experienced. These processes require individuals to understand the intentions, actions and goals of the person being observed. It includes the ability to understand the other people's perspective, to their intentions and goals, in ways that enable cultural learning (Tomasello, 2004). This enabling extends to artefacts and practices which are, "exemplified prototypically by the use of tools and linguistic symbols, which invariably point beyond themselves to the phenomena for which they have been designed (Tomasello 2004: 52)." These propositions suggest there are two different kinds or levels of imitation: i) copying the organisational structure of behaviour and ii) copying the surface form of behaviour (Byrne & Russon, 1998) which implies that, for the former, individuals need to develop a hierarchical structures of actions, as has long been acknowledged in developmental psychology (Kosslyn, 1994). As Bryne and Russon (1998) point out, following Piaget, complex behaviour is seen as constructed by combining and coordinating low-level components (e.g.

mental, perceptual, or motor schemes) into novel sequences (p. 677). Indeed, (Meltzoff & Decety, 2003) go as far as to suggest that:

... imitation is innate to humans and precedes mentalisation – also provides the foundation for social cognition, including empathising (i.e. understanding others' minds) with the social partners with which individuals engage. (p. 491)

Hence, individuals' engagement with what they experience is not just an acceptance of what is being experienced, as in transmission of experience. It is the active engagement with it that extends to its rebuttal or rejection, except in the most forceful or brute examples. Indeed, individuals are selective with what they elect to engage (Baldwin, 1898): albeit informants and/or other sources from the social and brute world. The cultural psychologist Valsiner (1998), for instance, states that we manage the social suggestion in person-particular ways. We cannot and do not respond to everything that is suggested by the social world as this would be overwhelming. Instead, we learn to rebuff, ignore and try not to engage with much of what the social world is suggesting to us, selecting and engaging with only those suggestions we believe are important or relevant for us. Glenberg, Schroeder and Robertson (1998) refer to the common human habit of averting our gaze to limit our engagement with suggestions from the world beyond us, as and when we need to focus our conscious attention to a particular task. So, part of individuals' mediation of the social suggestion is the ability to exclude extraneous and unhelpful demands on conscious thinking, such as those which are projected by the social world. As mentioned earlier, Berger and Luckman (1966) position the social world as being unable to project its message uniformly and comprehensively, on the one hand, and to be perceived as suggested. So, again, individuals' observing and hearing are not just unidirectional processes of transmission and unconditional acceptance, as early behavioural accounts might propose. Instead, the mediation of what is experienced and its particular construal by individuals comprises a dual or bidirectional process (Valsiner, 1994). Whilst individuals cannot wish away the suggestion of the social and brute worlds (Searle, 1995), they can mediate how they elect to engage with them. So, processes of engaging with the social world through mimesis are not passive. They can be highly intentional and focussed process as determined by the knowers.

In sum, in this section it has been proposed that in many, but not all, accounts that processes of mimesis are demanding, complex, and possibly foundational to human cognition including how we engage with and learn from others (i.e. inter-personally). Therefore, it is now appropriate to consider what constitutes the efficacy of these processes for human learning and development and for instance as wretched towards the kind of purposes that HRD is directed.

The efficacy of mimesis

Both longstanding and more recent findings from within cognitive science and developmental psychology offer insights into processes comprising mimesis and how it assists represent what has been experienced and then its recall and utilisation. That is its efficacy. Rather than verbal and other forms of declarative knowledge, these representations comprise kinds of knowledge that are non-declarable or discursive, yet include those captured through neural processes: i.e. vision, hearing and touch. These representations have been described earlier within cognitive psychology (e.g. Glaser, 1984) as schemata comprising both the representation of conceptual and procedural and perhaps emotive or dispositional elements. Importantly, schemata exist independently of language, as how humans construct and organise them is not declarable. Consequently, declarative forms of representation are not necessarily central to the generation, recall and exercise of schemata (Harris, 2007). Hence, they permit the capturing, representation and recall and utilisation of the capacities required for effective work performance, yet are also reliant on sensory-based knowledge, and are not wholly dependent upon declarative forms. The important point here for the HRD project is that much of this learning is not easily represented or captured through means that can be written down or spoken. Hence, reliance upon declarative knowledge in assisting and assessing learning can only be partial and will always be incomplete.

However, conceptions of knowledge representation in the mind became tainted with narrow accounts within cognitive psychology that viewed the mind as being analogous to a computer and its function being about processing information. This analogy was found to be highly erroneous because whereas humans seem to have fantastic memories, we have limited processing capacities (Sweller, 1990), and the organisation of our cognition by higher forms of procedural and executive processes is premised on

utilising that memory and easing the demands on conscious thinking. For example, the compilation of separate procedures when undertaking tasks realises the ability to undertake a task whilst making minimal demands upon conscious or working memory (Anderson, 1982). Moreover, recent work with cognitive science, informed by findings from radiography-imagery techniques, conclude that representations in memory seem to be grounded in experience and utilises a range of sensory contributions to capture, represent and then recall and utilise those experiences (Kosslyn, 1994). A term used to capture this kind of representation is 'simulation'. He defined as a "re-enactment of perceptual, motor, and introspective states acquired during experience with the world, body and mind" (Barsalou 2008: 618). Radiographic images indicate that even when engaged in the most basic forms of thinking and acting there are activities occurring simultaneously across diverse cognitive processes and parts of the brain, suggesting that "simulation provides a core form of computation in the brain" (p. 619). Mental imagery comprises a foundational simulation mechanism and seemingly arises through deliberate attempts to construct conscious representations in working memory. Cognition, therefore, is not only premised on the active and engaged nature of processes of perception and action, but emphasises the importance of observation and representation that arise through experience. Indeed, simulation is associated with accounts of grounded cognition that focus on situated action, social interaction and the environment that together suggest that the cognitive system evolved to support action in specific situations, including social interaction. Grounded cognition "reflects the assumption that cognition is typically grounded in multiple ways, including simulations, situated action, and on occasion, bodily state" (Barsalou 2008: 620), all of which is particularly salient and relevant for adults' learning through practice at work.

These accounts stress interactions amongst perception, action, the body, the environment and other agents, typically during goal achievement (Barsalou 2008), such as when engaging in learning and work. That is they are active and multi-modal, rather than them being amodal processes of the kind proposed through the information processing view of cognition. An aspect of simulations and their evidence base is an overturning of earlier critiques of imagery and introspection as not being sufficiently scientifically grounded (Kosslyn, Thompson, & Ganis, 2006). Barsalou (2008) suggests that, because of these critiques, during the cognitive revolution, introspection and imagery were marginalised as explanatory

concept as they could not be empirically presented, and declarative forms of knowledge representation became privileged, as they are today, within schooling and schooled societies. Yet, as well as encompassing a range of sensory contributions to cognitive processes and representations, conceptions of simulations urges a move away from accounts of representation of memory as largely about the passive storage of information. Instead, it accounts for cognitive processes associated with particular events and circumstances in which individuals have acted or engage. Consequently, the premise here is that these multi-sensory derived simulations are foundations for much of thinking and acting, as well as representation of knowledge in memory.

The richness of the immediate social environment is also referred to by Bryne and Russon (1998) as providing priming for recall or (re)cognition as the presence of a rich environment is aligned to objects, practises and settings that those who are perceiving already know. Whilst these ideas say much about the process of experiences and experiencing, thereby emphasising localised or situational factors, they also suggest that forms of higher-order thinking are engaged in the enactment of mimesis. These kinds of considerations, and particularly the concept of simulation and their management by higher cognitive processes, offer explanation of what workers reported in the studies referred to at the beginning of this paper. When they refer to the potency of 'just being there' and 'observing and listening', these workers may well be referring to the efficacy of simulations, whilst not being consciously aware of their contributions. Also, engagement in authentic activities has largely been seen in terms of reducing the knowledge transfer task by closing the distance between the circumstances in which the knowledge is experienced and learnt and those in which the knowledge is applied. Once understood that situational and circumstantial factors shaped cognition, it became, in some ways, clear why the transfer or adaptability of knowledge from one particular situation (e.g. the training room) was often quite limited to other circumstances (i.e. where the knowledge was to be applied). However, perhaps more than just being about rendering transfer 'near' rather than 'far', the richness of the physical and social environment which some have referred to extensively (Jordan, 1989; Lave et al., 1984) is presumably being represented in a multisensory and richly interlinked simulation which permits the rapid recall of knowledge through the availability of a range of situational and circumstantial clues and cues. Consequently, the findings of

Tomasello (1998) and Call and Tomasello (1994) led them to incorporate observational learning of the properties of objects and potential relationships among them as being salient for learning from and through others. The implications here for HRD are associated with the authenticity of experiences and opportunities for learners to engage and come to know in these ways.

Moreover, individuals' earlier or premediate experiences assist fill in those elements which are not available to them visually or aurally. All of these processes are derived not only from the richness of the particular circumstances in which cognition occurs, but also how individuals engage and interact with those circumstances. As it is, because workers are usually engaged in goal-directed activities within circumstances of practice, they are likely to be richly informing of those circumstances.

Finally, these kinds of advances also prompt re-engagement with the idea that cognitive processes are not only multi-sensory, but also likely to be richly embodied. As proposed by Lakoff and Johnson (1999) and, before them, Bourdieu (1977), there has been a denial of the embodiment of knowledge, perhaps because of the privileging of declarative forms of knowledge and knowing. Yet, just as Ryle (1949) advocated for procedural capacities (i.e. 'ghost in the machine') to be recognised and included in accounts of knowledge and more recently the need to place dispositions centrally within accounts of knowledge and knowing by Perkins, Jay and Tishman (1993) considerations of the range of sensory contributions is evident in these accounts, and warrant inclusion. All of these propositions seem to suggest processes that make individuals' cognition much more than a narrow and uni-modal cognitive process. Certainly, these processes position memory working in the service of perception and action (Glenberg, 1997) as much as just storable knowledge. Perhaps in short, and as Marchand (2008) suggests, these accounts extend our understanding of human knowledge and learning beyond what people really think and say, to include what they actually do.

So, how does all of this help understand learning through practice and for HRD purposes? In some ways, the account provided here illuminates how the physical and social circumstances in which activities occur play a significant role in the cognitive processes that comprise the thinking, acting and learning that occurs as people engage in work and also in training programs. Considerations of rich environments include those providing an array of contextual information which situates, informs and mediates the activity or

interaction which is being engaged with or learnt. Of course, such considerations are hardly new. The situated cognition movement of the 1990s emphasised just these factors: that there were particular cognitive consequences associated with the circumstances in which individuals engaged, the kind of activities in which they engaged and the social partners with whom they interacted (Brown, Collins, & Duguid, 1989). This movement emphasised the importance of authentic activities and the need for experiences within educational programs preparing individuals for specific occupational outcomes to include experiences in the circumstances where those occupations are practiced (i.e. the immediate experience) and a call for other kinds of educational processes to be enriched by embedding them within particular and applied contexts. Accounts from mainstream psychology now not only complement these conceptualisations, but stand to augment through assisting understandings about how human cognition functions intra-psychologically. Here, the focus is on mimesis as such a process that needs to be more fully understood. It is noteworthy, that whereas sociocultural theory has engaged cautiously with intra-psychological processes, this has not been the case with anthropology, which willingly incorporates such views.

Moreover, the kinds of accounts emanating from cognitive science extend to and include the suggestions from the social world in ways that cannot be dismissed simply as being asocial contributions. In particular, the concept of simulation offers bases for understanding the potency of authentic learning experiences, such as those in practice. It also emphasises the importance of visual imagery and the role of observation and higher-order processes that have executive functions in the organisation, representation, and recalling of the representations that comprise simulations. Moreover, these same higher-order processes appear to be supporting the processes of imitation and practice, including engaging in ontogenetic ritualisation, for instance. The concept of simulations also informs of how activities in circumstances different from those in which the learned knowledge needs to be applied may be rendered cognitively problematic because the semantic and contextual bases of the circumstances do not assist in cognitive processes. The importance of multimodal representations is such that the range of modal contributions to what is experienced will shape cognition and, consequently, processes of thinking, acting and learning. All of these are found in the process of mimesis.

Mimesis and HRD

To recap: the aim of this paper is to commence setting out what might constitute an account of workers' learning for and in the circumstances of work through mimesis, and how this account might inform HRD practices. Such an account likely should contain a clear statement of purpose and include accounts about: i) the processes by which mimesis (including observation) occurs and the bases of its efficacy; ii) the kinds of outcomes (i.e. learning) that it generates; and iii) bases for understanding procedural implications (i.e. how mimesis might be utilised and enhanced). It follows then, that in this final section these are tentatively set out, drawing from the discussions above.

Processes through which mimesis assists learning through work

Mimesis has been long been acknowledged as a process of learning, yet likely has a far greater role than was ever or is currently understood. Its application to everyday learning through and for work aligns well with the HRD project. Observation and then imitation not only require higher-order cognitive functions, but they may well contribute to all levels of cognitive activity given the salience of images, sensory input and groundedness. Certainly, fundamental processes of cognition, comprising perception, action and introspection or individuals' construal and construction of what they experience, are premised on the contributions of observation and engagement of the kind that comprises imitation. In this way, these processes assist both the generation and utilisation of the representations of knowledge in memory referred to by some as schemata (Glaser, 1984) and by others as simulations (Barsalou, 2009) albeit given their distinct emphases. Moreover, because these representations are generated through individuals' engagement with what they experience they are likely to be person-dependent to some degree. Yet, these experiences and how they are experienced provide the rich contextualisation that furnishes clues and cues, forms and norms that constitute elements of these representations. Yet, individuals' perception or construal, action or construction as well as introspection will be premised upon: i) the degree by which, at one level, individuals exercise their cognitive capacities in monitoring, directing energy and reconciling what they experience, ii) qualities of human cognition that may be beyond conscious recall (i.e.

unconscious consciousness), yet have arisen through individuals' experiences and iii) executive functions which are also beyond easy recall, yet seemingly play an important role in this process. In this way, the generation and utilisation of representations in memory is founded upon individuals' epistemological interest, unconscious capacities and some kind of executive functions. So, a key concern here for HRD practices is coming to understand and engage with how individuals construe and construct knowledge and come to privilege these in HRD plans and practices.

HRD outcomes that arise through mimesis

Following from the above, the outcomes that arise through mimesis comprise both declarable and non-declarable forms of knowledge. That is, those which can be stated, and those which not only cannot be easily stated, but may even extend to being beyond direct conscious engagement, and, therefore, control. So, at one level, the grounded and situationally-rich representations provide bases that are tangible and real and both inform and support the enactment of associated representations, such as visual imagery. Yet, at another level there are executive functions that reflect individuals' intentionalities that are difficult to articulate, and yet which cannot be readily declared or engaged with consciously. It seems it is this combination of contributions that workers across a range of studies have referred to above refer to as being directly helpful when individuals engage in work-related activities that allow them to observe, listen and then reproduce what they have observed and heard. Of course, this groundedness also explains the limitations that often arise when knowledge learnt in one circumstance resists being applied in other circumstances because the elements which comprise the images, embodiment and other sensory input are remote or absent. In this way, there are limitations when the circumstances to which the knowledge is to be applied is different from the work in which it was learnt, and when individuals are unwilling, unable or incapable of applying the higher-order cognitive functions in abstracting from the particular situation the elements of the simulation or construal that are relevant to another situation. All of this reminds that what is often referred to as the transfer problem, is associated with situational factors as well as individuals' learning processes.

Implications for HRD practice

The procedural implications here suggest the importance of engagement in experiences that situationally ground the cognition and, therefore, workers' learning of what is experienced. Consequently, opportunities for individuals to engage in situationally-authentic circumstances such as workplaces, and the capacity to work alongside, with or in reasonably close proximity to those who are more experienced and whom they can observe and use as models to monitor their own performance relatively would seem to be essential. Moreover, having close guidance (i.e. direct interpersonal interaction) when engaging with knowledge that is unlikely to be learnt by discovery alone may well be essential to enrich the process of construction and develop robust simulations. Hence, providing opportunities for engaging in the circumstances of practice and for periods of time, perhaps different kinds of circumstances supported by the opportunity to consider and compare what is being experienced across these settings will be supportive of effective mimesis. Moreover, findings ways of identifying and reconciling what workers currently know, can do and value is likely to be important for seeking to align or make efforts to align those with the kinds of knowledge to be learn for workplace or HRD purposes. Then, to reconcile differences in what is being experienced and, then to incrementally engage in activities providing experiences for imitative performances to be trialled, honed and for the individuals to move towards increasingly mature approximation of what they have observed. This consideration includes how worker-learners might be prepared for, engaged in, and monitored and guided when learning without close interactions with more experienced partners, maximise their learning as associated with workplace and HRD purposes.

In sum, it is anticipated that the discussions earlier in this paper and tentative premises outlined just above can allow a critical debate about the need for and inform an account of mimesis and its utilisation in ways that can support adults' learning through and for work that is so central to the HRD project. Given the significance of mimesis to adult workers' learning and development and the limited explication available in the literature, these processes warrant careful consideration about how the goals of HRD can be realised through capturing, directing and more on fully utilising workers' capacities and interests, and perhaps less on the provision of training.

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