Submission 14366

An Analysis of Schema Change Interventions

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Abstract

Successful organizational transformation relies on being able to achieve paradigm or collective schema change, and more particularly, the ability to manage the interplay between pre-existing schemas and alternative schemas required for new environments. This conceptual paper presents an analysis and critique of collective schema change dynamics. Two schema change pathways are reflected in the literature: frame-juxtapose-transition and frame-disengage-learning. Research findings in each pathway are limited and/or contradictory. Moreover, research on schema change focuses primarily on social dynamics and less on the relationship between social schema change dynamics and individual schema change dynamics. One implication of this lack of focus on individual schema change dynamics is the masking of the high level of cognitive processing and cognitive effort required by individuals to effect schema change. The capacity to achieve organizational transformation requires that more attention is given to managing these dynamics, which, in turn, requires significant investment in developing the change leadership capabilities of managers and the organizations they manage.

Key words: Schema change; change leadership; organizational cognition

Most models of organizational transformation (OT) give little explicit consideration to, or ignore, the usually implicit cognitive structures or schemas that reinforce pre-existing organizational arrangements and behaviour (Senge, 2006), despite the fact that change at this level is the defining characteristic of OT (Bartunek and Moch, 1987). Organizational members evaluate change communication through the lens of these pre-existing schemas and an inability by organizational members to change pre-existing schemas can result in change failure, even when change might prove beneficial to them (Labianca, Gray and Brass, 2000). Consequently, a critical element of planned OT is how change leaders influence organizational members to replace, elaborate or functionally delete individual and collective schemas in line with new organizational images (Dixon, Meyer and Day, 2010; Gioia and Chittipeddi, 1991). Unless individual and collective schemas change, then transformations of formal organizational arrangements will not be sustained, or the benefits not fully or sufficiently realized (Beer and Nohria, 2000).

Despite its importance for successful OT, the empirical literature on the dynamics of planned schema change is sparse, though research on this issue has emerged periodically over the last 30 years (for example, see Balogun and Johnson, 2004; Bartunek, 1984; Labianca, Gray and Brass, 2000). Moreover, while early work on dialectical processes associated with schema change has attracted some attention (Bartunek, 1993), more recent schema change theories have not (e.g., Balogun and Johnson, 2004; Labianca, Gray and Brass, 2000). This lack of attention to schema change dynamics is surprising given its role in successful OT and social change more generally.

Schema change research can be located within the much broader sensemaking literature which has been defined as the "process of social construction in which individuals attempt to

interpret and explain sets of cues from their environments" (Maitlis, 2005: 21). In this literature, the 'social construction', which we refer to as a schema, is typically referred to as an "account or discursive construction of reality" (Maitlis, 2005: 21). Walsh (1995) has identified in excess of seventy labels for 'cognitive constructions' however to this point little attention has been given to clarifying their similarities and differences. We have selected the concept of schema and elaborate the concept in the discussion below.

Much of the recent sensemaking (and sensegiving) research focuses on the relationships between social processes and variations in "discursive accounts" (Maitlis, 2005) and the identification of triggers and enablers of sensegiving (Maitlis and Lawrence, 2007). This focus is also true of schema change research where, as we discuss in more detail below, there has been a focus on determining when social (particularly) dialectical processes play and do not play a role in schema change (Balogun and Johnson, 2004; Labianca, Gray and Brass, 2000). Less attention has been given to understanding the relationship between social processes and schema change on the one hand and schema change processes at the individual level on the other, in large part due to the lack of models of individual cognitive structures (for an exception, see Thompson and Hunt, 1996). The consequence of not addressing both social and individual schema change dynamics is the masking of the high level cognitive processing and cognitive effort required by individuals to effect individual and collective schema change.

Given these circumstances, it is an appropriate time to seek to bring together existent research on collective schema change in the context of OT. The purpose of this conceptual paper is to critique the existing literature on leader-driven schema change interventions by (1) identifying and clarifying two main schema change pathways reflected in the schema change

literature, (2) considering these findings in the light of Thompson and Hunt's model of individual level schema change, and (3) proposing directions for future research. Our overarching research question is: how do collective schemas change and what facilitates and constrains schema change? We suggest that a better understanding of the relationship between social and individual schema change dynamics will lead to better OT interventions and better OT outcomes.

SCHEMA AND SCHEMA CHANGE

Weick (1979: 50) defines a schema as 'an abridged, generalized, corrigible organization of experience that serves as an initial frame of reference for action and perception: A schema is the belief in the phrase "I'll see it when I believe it."' It is the extent to which schemas are corrigible and the conditions under which they can be rendered more corrigible that is at issue in this paper, an issue around which there is considerable controversy (e.g., Epitropaki and Martin, 2004).

Schemas tend to be less corrigible because they tend to be taken for granted, implicit and automated (Fiske and Taylor, 1991), not readily available for testing and change (Argyris and Schon, 1996), serve important stability functions for individuals (Epitropaki and Martin, 2004), and, therefore, tend to persist even in the face of disconfirming evidence (Labianca, Gray and Brass, 2000; Fiske and Taylor, 1991). Moreover, they are, consistent with Weick's definition, inevitably incomplete and subject to error (also see Walsh, 1995). In many respects the evolution of human thought is related to schema change and development and seeing our organisational (and wider) worlds in new ways. We see this process reflected in the conference theme of transitioning from 'West leads East' to 'West meets East.' However,

despite intentions, there are strong social and individual level constraints on the capacity to effect schema change, making an understanding of how they change more important.

Organizational members possess and share many schemas. For example, previous research on schema change has focused on identity schema (Gioia and Thomas, 1996; Reger *et al.*, 1994), change process schema (Balogun and Johnson, 2004), change schema (Lau and Woodman, 1995), decision-making schema (Labianca, Gray and Brass, 2000) and organizational schema (Balogun and Johnson, 2004). OT is likely to involve the simultaneous activation and testing of several schemas and their interrelationships, imposing significant cognitive and social information processing load on individuals and organizational relationships. Given these circumstances, it is little wonder that a large proportion of transformation efforts fail (Beer and Nohria, 2000).

Nevertheless, despite these constraints on schema corrigibility, there are circumstances in which schema change is necessary for organizational survival (Schein, 2004). Typically, change leaders seek to anticipate and frame new ways of thinking more congruent with new 'realities.' The issue of how and in what ways schemas change is fundamental to understanding how to transform organizations (Argyris, 1990; Bartunek and Moch, 1987; Porras and Silvers, 1991; Quinn, 1996).

In summary, leader-driven schema change is the product of both individual (Thompson and Hunt, 1996; Weick, 1995) and social processes (Maitlis and Lawrence, 2007; Bartunek, 1984), though the research emphasis to date has been on social processes. It involves a complex sensegiving and sensemaking process (Maitlis and Lawrence, 2007; Gioia and Chittipeddi, 1991; Weick, 1995). This process is possibly most apparent in the context of the

socialisation of new organizational members, as they 'learn the ropes' (Van Maanen and Schein, 1979). In important respects, and consistent with the focus of this paper, organizational transformation creates environments in which most, if not all, organizational members have to 'relearn the ropes'. 'Relearning the ropes' typically involves the development of new organisational schema.

Individual schema change dynamics

Very little attention has been given to schema change dynamics at the individual level in the managerial and organisational studies literature. An important exception is the work of Thompson and Hunt (1996). Thompson and Hunt's (1996) model links individual cognitive structure, cognitive processing, cognitive change and permanence of associated behaviour change. According to Thompson and Hunt individual cognitive structures are hierarchical and operate at three levels; a super-ordinate level (the overall category, for example leadership), the level of basic beliefs (non-evaluative and evaluative beliefs underpinning super-ordinate level) and the level of subordinate values, the comparison standard for beliefs. The levels are connected by associative networks which vary in terms of strength of association. Each level provides qualitatively different information, and each level differs in terms of the cognitive effort required to access and utilise the information in the structure (657).

Thompson and Hunt argue that cognitive change involves four cognitive processing steps; (1) initial activation of the cognitive structure at super-ordinate level following, for example, exposure to change leader change communication, (2) a second activation step involving spreading activation across the cognitive structure through associative network paths, (3) cognitive processing designed to reduce discrepancies between new information and pre-existing beliefs and values; this involves, for example, assessing the consistency between new

information and pre-existing beliefs and values and looking to the views of others for clarification and support, (4) the highest level of processing and cognitive effort; level 4 involves the comparison between new information and the contents of the cognitive structure and, importantly, among the old contents of the pre-existing structure. Thompson and Hunt argue that cognitive processing can be inhibited by concurrent cognitive activities and the level of prior knowledge and experience of the new information.

Thompson and Hunt draw on Golembiewski, Billingsley and Yeager's (1976) change typology to illustrate how cognitive structures change. Here, consistent with our focus on OT, we focus on one change type, Gamma change. Gamma change, consistent with the idea of schema change, involves "a redefinition or re-conceptualization of some domain, a major change in the perspective or frame of reference within which phenomena are perceived and classified, in what is taken to be relevant in some slice of reality (Golembiewski, Billingsley and Yeager, 1976). Thompson and Hunt argue that there are two types of Gamma change; Gamma type 1 change occurs when the basic beliefs and/or subordinate values change. For example, beliefs may be deleted from the structure, or new beliefs or values added. Gamma type 2 change occurs when the "existing set of beliefs and values realign themselves so that two new structures are developed" (680). Gamma Type 2 change occurs following a large number of Gamma type 1 changes and results from higher levels of cognitive effort. The change occurs after learning new information that is interrelated; "the information is all related to an overall, single construct, but is more manageable in separate structures" (681).

Thompson and Hunt's conceptual model of cognitive processing and change provides a useful means of elaborating our understanding of findings drawn from research on social processes of schema change. In the next section we consider this research.

Existent literature on collective schema change

Based on a review of the literature on leader interventions and schema change, we suggest that two main planned schema change pathways capture current thinking on schema change: (1) frame-juxtapose-transition (Labianca, Gray and Brass, 2004; Bartunek, 1993) and (2) frame-disengage-learning (Balogun and Johnson, 2004). Each pathway has been linked to different schema change outcomes. Currently, four types of schema change outcome have been identified: (1) a reinforcement of pre-existing schemas (no change or change failure), (2) the development of an acceptable synthesis of old and new schemas (Bartunek, 1984), (3) new schemas replace old schemas (Balogun and Johnson, 2004; Labianca, Gray and Brass, 2000), or (4) old and new schema co-exist in creative tension (Palmer and Dunford, 2002). Each of these pathways will now be examined in more detail.

Frame-Juxtapose-Transition

Prior research suggests that leader-driven schema change involves four phases (Bartunek, 1993; Labianca, Gray and Brass, 2000): framing a new schema, juxtaposing new schema with pre-existing schema, and transitioning, by various means, from pre-existing to new. At least four inter-schema dynamics underpin transition: conflict or dialectical processes (Bartunek, 1993; Van de Ven and Poole, 1995; Weick, 1995), coexistence of competing schemas (Palmer and Dunford, 2002), iterative inter-schema comparison (Labianca, Gray and Brass, 2000), and attraction (Ford and Ford, 1994). We now consider evidence related to each dynamic.

Frame-juxtaposition-transition-conflict

In the dialectical process view, schema change is facilitated by inter-schema conflict as individuals and subgroups align with pre-existing or new schemas (Bartunek, 1993). The interplay between groups holding different schema challenges and elaborates schema comparison and change. Change leaders play a key role in creating facilitative circumstances by embedding appropriate conflict management norms (Bartunek and Reid, 1992), intervening to change formal organisational arrangements to create forums within which different perspectives can be aired (Bartunek, 1984) and facilitating resolution of the inter-schema conflict by 'holding' both sides of the conflict simultaneously (Bartunek, 1993; Quinn, 1988).

Bartunek and her colleagues studied the relationship between structural interventions and organizational schema change in a variety of organizational contexts. For example, in the case of the restructure of the religious order, the intervention led to one group aligning with the traditional educational role of the church and another group aligning with a social justice role. Bartunek (1984: 329) reported that, in the context of a facilitative organizational restructure: 'Conflicts between these groups continued over several years. Eventually, some members began to realise that education and justice were potentially complementary.' That is, a synthesis of pre-existing and new schemas was achieved. However, participative dialogue is not the only means of conflict resolution. Poole, Gioia and Gray (1989) reported a successful case of schema change in which coercion was used to deal with inter-schema conflict. They argued that coercion is necessary to produce schema change in highly stable cultures.

In some organizations, inter-schema conflict has to be created. Dent (1992) investigated the successful transformation of a European rail organization from railway culture (pre-existing schema) to managerial-economic schema (new frame). A key element of transitioning involved the creation of conflict. Newly recruited business managers (1) organised forums and 'staged contests' around strategically selected issues in which they could reinterpret issues in terms of a 'managerial-economic' perspective (Dent, 1992: 31). Over time, Dent reports a shift toward a more managerial-economic schema. However, the shift ultimately involved the departure from the organization of technical managers who found that the managerial-economic schema: 'Reduced their autonomy and threatened their pride as railway operators and engineers; they thought the emerging decisions unprofessional and feared for the quality of the railway' (Dent, 1992: 33). Hence this group, despite the interventions still interpreted change through the lens of pre-existing 'railway' schema.

Inter-schema conflict does not always produce schema change (Bartunek and Reid, 1992). Bartunek and Reid (1992) reported failed schema change in the context of efforts to improve inter-departmental coordination in a school system (*departmental autonomy* versus *inter-departmental coordination*). Bartunek and Reid attributed the failure of Faculty to reframe in the expected way resulted from their use of pre-existing conflict management schemas (passive resistance and exclusion) to deal with change attempts. Similarly, Davis, Maranville and Obloj (1997) studied schema change in the peak body of the Polish fruit and vegetable industry. Organizational Transformation (OT) involved collective schema change: from *centralised regulator* to a *decentralised facilitator of long term planning and cooperative problem solving*. The transformation was deemed a failure. Davis, et al (1997) argued that organizational members continued, despite interventions, to interpret their role in terms of the traditional schema (centralised regulator) and not the new 'decentralised facilitator' schema.

Frame-juxtaposition-transition to schema coexistence

The literature on paradox and contradiction (Clegg, da Cunha, and e Cunha, 2002; Lewis, 2000) suggests that the simultaneous coexistence of two competing schemas is a possible outcome of schema change interventions (Palmer and Dunford, 2002; Isabella, 1990). Holding two competing schemas simultaneously is, typically, aversive and triggers conflict (Lewis, 2000). It has been described as a schizoid state (Greenwood and Hinings, 1988) or a schizophrenic frame of reference (Westenholz, 1993). In most circumstances, inter-schema conflict will result in a preference for one or the other schema, a contingency view, or a synthesis of the two schemas (Clegg, da Cunha and e Cunha, 2002). However, the literature on paradox suggests that organizational members can learn to accept a state in which apparently irreconcilable and competing schemas co-exist (Bailey and Neilsen, 1992; Murnighan and Conlon, 1991; Palmer and Dunford, 2002).

For example, Murnighan and Conlon (1991), in a study of the dynamics of British string quartets, identified three paradoxes: the leader versus democracy paradox, the paradox of the second fiddle and confrontation versus compromise schema. They found that the most successful British string quartets 'recognised and managed the inherent paradoxes they faced' (Murnighan and Colon, 1991: 181). For example, in successful groups, 'first' violinists recognised the need, despite a strong belief in their own professional autonomy, for directive leadership more than did 'first' violinists in the less successful groups. Similarly, Bailey and Neilsen (1992) found that educational professionals were ultimately able to tolerate conflicting schemas related to alternative conceptualizations of educational program delivery. Palmer and Dunford (2002) also found a capacity to accept competing schemas or "discursive logics" (1045) related to competitive individualism and collaborative teamwork in an

Australian travel agency and they argued that the capacity to manage this creative tension contributed to business success.

However, Westenholz (1993) found that paradox and contradiction inhibited rather than facilitated change in members' frames of reference, or schemas. Westenholz (1993) identified three frames of reference (schemas) on the issue of remuneration: logical frame of reference (take one position unambiguously and reject the others); pluralist frame of reference (take one position but accept that other positions exist); and schizophrenic frame of reference (positions co-exist). Conflict among these conflicting perspectives continued for at least ten years, and organizational members were no closer to a resolution.

The 'conflict' and 'coexistence' sub-paths both involved dialectical processes (indeed these processes play a critical role in both schema change pathways considered in this paper, even though it tends to be de-emphasised in some schema change theories). However the evidence suggests it is not only conflict that creates successful change outcomes. Contextual factors, for example, appropriate conflict management norms (Bartunek and Reid, 1992) also play a role. To date however little attention has been given to identifying and clarifying these contextual factors.

Frame-juxtaposition-transition by iterative comparison
Labianca, Gray and Brass's (2000) Iterative Comparison Theory of schema change suggests a second schema change dynamic. Labianca, Gray and Brass (2000) question whether inter-schema conflict is a necessary outcome of juxtaposing new and alternative schemas. Instead, they argue that schema change is a function of a 'long and iterative' inter-schema comparison process in which new in-progress frames of reference and old schemas are evaluated against

ongoing actions to determine the validity of the new schemas (239). This process, they argue, occurs first at the individual level followed by social negotiation at the collective level.

Their research case involved a new participative leader who 'had a vision [the case organization] that included a more empowered organization in which more decisions were made at lower levels' (239). The pre-existing decision-making schema was described as one in which a feared and distrusted management resorted to participation as 'show'; where input went into a 'black hole'; and decisions were 'predetermined' (249). The research was conducted in the context of a 13-person team consisting of managers and non-managers. The team was set up to decide on a new organizational structure for the organization and to use a decision process that reflected the new decision schema. At a critical point, the change almost failed. The researchers wanted to explain why organizational members resisted an intervention that would result in their empowerment.

In the inter-schemas comparison phase, employees monitored the behaviour of managers on the committee to determine whether their behaviour was more consistent with the pre-existing schema or the new participative schema. In this case, fear and distrust of management led non-managerial members of the committee to interpret management actions in terms of the pre-existing rather than the new schema, creating high levels of tension between managers and staff, subsequently resolved at a workshop conducted by the researchers. Labianca et al's explanation of schema change hinged on seeing schema change as something akin to an 'accounting' process in which evidence for and against schema change was accrued.

Labianca et al (2000) drew three conclusions from their results. First, they suggested that schema change involved the 'sudden and massive' replacement of the old decision-making schema by the new schema rather than an emerging synthesis of old and new, as suggested by Bartunek's (1993) conflict theory. Second, the core problem hindering relocation from pre-existing to new schema was 'the change recipients' failure to revise old decision-making schemas and to enact new schemas during a pivotal period in the empowerment effort' (236). The failure to revise old decision-making schemas was linked to the degree of dissonance between new and pre-existing schemas, and scepticism that manager statements on change were congruent with action. Third, Labianca, Gray and Brass suggested that 'our model does not emphasise this conflict between groups championing different schemas: We instead emphasise a schema comparison process that occurs at the individual level and in the eventual social negotiation of a shared organizational schema' (251). However, while inter-schema conflict was not emphasised in their conclusions, managers and non-managers did hold conflicting schema. Managers were reported to hold the new schema while non-managers held to the pre-existing schema. A workshop facilitated by members of the research team helped resolve this conflict. Labianca, Gray and Brass's (2000) results, therefore, seem to reinforce the conflict model of schema change rather than a new theory of schema change.

However, Labianca, Gray and Brass (2000) point to the critical importance of individual-level processing in schema change; individuals focused on confirming and disconfirming evidence in support of pre-existing or new schemas in the transition. Conflict still plays a role in the social negotiation process at the collective level; however, the focus of information processing at the individual level is an important one and is given little attention in the current schema change literature.

Frame-juxtaposition-transition by attraction

The third transition schema change dynamic emerges from the attractiveness or appeal of the alternative or new schema (Levin, 2000; Ford and Ford, 1994). The core argument is that transition to a new schema is more likely if, collectively, organizational members find, in comparison to the pre-existing schema, the new schema intellectually and emotionally appealing (Zaccaro and Banks, 2001; Kotter, 1999; Miles, 1997; Nadler and Tushman, 1990). That is, the new schema triggers discrepant comparisons between the current organization and the organization as it could be (Gioia and Thomas, 1996). In this context, inter-schema conflict is less salient. The new schema becomes the standard against which organizational members evaluate current thinking and action (Gioia and Chittipeddi, 1991; Gioia and Thomas, 1996).

In this context, Gioia investigated top level managers' reasoning about strategic change in a public university at two points in the change process, at instigation stage (Gioia and Chittipeddi, 1991) and again when the process was 'well underway' (Gioia and Thomas, 1996). Strategic change was defined as 'a revision in the interpretive schemes not only of the top management team but of the organization's members and constituencies as well' (Gioia and Thomas, 1996: 373). The managers sought change from a university with a 'little hardening of the arteries' to a 'Top Ten public university'. Gioia and Thomas (1996) established that strategic change inevitably requires: 'Somehow altering aspects of the central qualities of the institution – their identity: One of the most pronounced findings was the intense focus on the projection of a desired future image as a means of changing the currently held identity' (p. 394).

The focus of the study was on the cognitive processing of the top three managers as they conceptualized the change, rather than on schema change within the broader organizational community. While the study had less to do with sensemaking and schema change by the organizational community, it clearly shows the transition logic of top level leaders as they sought to create strategic change. The path to altering identity was the projection of a compelling future image which would destabilize identity and 'pull' it into alignment with the desired image. A 'plausible, attractive, even idealistic future image would seem to help organization members envision and prepare for the dynamic environment implied by strategic change' (Gioia and Thomas, 1996: 398).

Thompson (2006) investigated organizational sensemaking and organizational schema change in the context of the transformation of a spatially dispersed public professional organization. The focus was not just on top level leaders but on the sensemaking and schema change across the organizational community over a three-year period. Transformation involved, as a key part, a reframed image of the organisation and a reframed process for realising this image (Thompson and Ryan, 2009b).

Focus group and interview data revealed two key findings. First, Thompson found that sensegiving by the change leader, and his articulation of a new image, had little influence on collective schema change. Two issues underpinned this result. First, organizational members' concerns were related to organizational threats that they felt were not being addressed by top-level managers. The new organisational image tended to ignore rather than address these threats, thereby increasing employee cynicism. Second, there was a widespread belief that organizational members had little influence over organizational vision or its realisation. Their future was determined by the political elite, not themselves. In contrast, the new

organizational schema implied greater agency by organizational members. This inter-schema conflict led to rejection of the new organizational schema.

However, the attraction dynamic was a key source of change in this case. Thompson found that the attraction dynamic explained sub-schema shifts. However, these shifts emanated from organizational members, not from the change leaders' vision for the organization. Thompson concluded that organizational schema change, or rather sub-schema change, can be explained by values congruence, where values operate as an implicit vision, an outcome more consistent with teleological processes than dialectical processes (Van de Ven and Poole, 1995). Activation of five values trigged sub-schema change: (1) whether the intervention contributed to better working relationships; (2) whether the intervention contributed to improved service to the public; (3) whether the intervention resulted in jobs that were more enriched; (4) whether the intervention contributed to the achievement of critical organizational tasks; and (5) whether the intervention resulted in organizational members feeling more confident and competent. If these values were met, then there was evidence of sub-schema change.

Thompson and Hunt analysis

The above analysis suggests that the frame-juxtapose-transition path to schema change involves (1) inter-schema conflict leading to a synthesis of old and new schemas or the simultaneous co-existence of new and old schemas, (2) a more 'rational' accounting iterative comparison approach in which observed consistent and inconsistent data are accrued, (3) attraction of a new way of viewing the world that triggers perceptions if discrepancy between old and new and the motivation to align with the new.

It is not possible to clearly specify the links between the social and individual levels of analysis; only one study (Labianca et al, 2000) addressed individual level schema change dynamics. Consequently, this analysis is tentative and speculative and designed to help elaborate directions for research on schema change.

In each of the research studies considered, schema activation was triggered by radical structural change, usually combined with change leader sensegiving. The main variations across studies appear in the relationship between Thompson and Hunt's level 3 and level 4 cognitive processing. In the case of Bartunek's (1993) conflict theory, the focus in level 3 processing is on social information processing, it says little about what happens at the individual level. Those who accept the new schema conflict with those who maintain the existing schema. If a successful synthesis of two apparently contradictory schemas is achieved, it would appear to represent Gamma change type 2 where two separate, though related structures are formed. The idea of coexistence of competing schemas also appears to imply at least Gamma type 2 change. In both cases the development of these schema change outcomes takes a lengthy period of time. It is therefore likely to involve a high and sustained investment of cognitive effort and would have a significant impact on individual and collective ability to manage concurrent change.

Iterative Comparison Theory of schema change (Labianca et al, 2000) is the only theory that focuses on individual schema change dynamics. In this view, individuals' social information processing involves a close monitoring of managerial behaviour and the degree to which managers' actual behaviour matches espoused behaviour. In processing information individuals adopt an 'accounting' orientation. Presumably if the weight of evidence collected by individuals supports consistency of managers' espoused and actual behaviour, then

schema change is more likely. If the weight of evidence indicates more inconsistency, then pre-existing schemas are likely to be reinforced. Schema change from this perspective is replacement of old schema with new, rather than a synthesis. The issue of schema replacement raises several issues. For example, what is replaced? The replacement of particular non-evaluative beliefs and evaluative beliefs is conceivable. However, it is less clear how implicit and subordinate values can be replaced by iterative comparison as quickly as suggested.

Schema change by attraction assumes a different path to schema change. In particular, individuals' social information processing involves looking to visionary leaders who frame a way of thinking that individuals accept as better than is currently the case. In this approach, schema change may be more rapid than in other approaches and involve much less social information processing and potentially cognitive effort. Moreover, schema replacement seems much more conceivable than in the previous approaches. When individuals accept a preferred new organisational image

This analysis suggests more attention should be given to individual level schema change dynamics and social schema change dynamics simultaneously. One particular issue worthy of attention is the nature of schema replacement. The idea of adding new beliefs and values as suggested by conflict theory is consistent with Thompson and Hunt. However, replacement would seem to be more problematic, particularly in the relatively short time frames addressed in the research.

Frame-Disengage-Learn

Balogun and Johnson (2004) suggest an alternative schema change path, particularly in circumstances where sense-giving is constrained by context. In Balogun and Johnson's case research, change leaders framed the change and then instead of juxtaposing a new schema with the pre-existing schema, they radically changed context in ways that rendered pre-existing schema obsolete or irrelevant (Balogun and Johnson, 2004). Schema change is, then, not a transition from pre-existing to alternative schemas. Instead, organizational members realised that pre-existing schemas do not permit sensemaking in the transformed context. Presumably, managers functionally delete the pre-existing schema and replace it with a new schema developed from ongoing direct experience in the context of either horizontal management networks (Balogun and Johnson, 2004) or change leader sensegiving (Corley and Gioia, 2004).

Balogun and Johnson (2004) studied middle managers' schema change in the context of the restructure of a privatized geographically dispersed United Kingdom utility across a period of approximately 12 months. The restructure was conceptualized as a shift from *organization as hierarch-common purpose* to *organizational as multidivisional-interdivisional relationships*. Geographical dispersion resulted in top-level managers being 'ghosts in the sensemaking of middle management' (524). Consequently, while the restructure was supported by vision workshops, road shows and team briefings, middle managers had to 'develop the details of their roles and responsibilities themselves once reassigned to the new structure' (526).

Across the period of their research, Balogun and Johnson (2004) found that the managers progressively developed, through interactions in managerial networks, new organizational schemas consistent with sensemaking in the new structure. This change, they argue, involved

schema replacement rather than synthesis of pre-existing and new schemas, as suggested by Bartunek (1984). That is, there was no interplay of old and new schemas, no dialectical process to trigger change. Peer networks at the middle-level provided opportunities for managers to construct a new organizational schema from ongoing experience (Balogun and Johnson, 2004). To differentiate their findings from those of Bartunek's (1984) conflict model, they argue that the conflict model may be more prevalent when there is no channel or mechanism to facilitate the resolution of conflict caused by the juxtaposition of new and pre-existing schemas (544).

Balogun and Johnson's (2004) findings have parallels in Corley and Gioia's (2004) study of successful identity change over a ten-month period in the context of the spin-off of a top-performing unit of a Fortune 500 company. A spin-off is a radical departure from the past and one likely to render pre-existing schemas obsolete. Corley and Gioia (2004) do not refer to the concept of schema explicitly. However, identity is typically understood as a self-schema (Reger *et al*., 1994). Corley and Gioia's (2004) model of identity change, therefore, has implications for schema change more generally. The pre-spin off organizational identity (more innovative, more agile competitor, safer and more reliable than the parent organization) lost meaning for organisational members after the spin-off. Organizational members had to develop a new identity consistent with new circumstances.

Corley and Gioia (2004) suggest that "identity ambiguity" was the key schema replacement dynamic. Identity ambiguity stimulated a sensegiving imperative in change leaders who framed a new identity by defining a desired future image, increasing branding efforts and modelling behaviours such as 'being something special', 'doing the right thing' and being 'stewards of the technology'. Corley and Gioia found that identity replacement occurred

within six months of the spin-off. Corley and Gioia (2004) argued that 'identity ambiguity' is different from 'identity conflict', a view consistent with Balogun and Johnson's (2004) assertion that rendering pre-existing schema obsolete means there is no duality of pre-existing and alternative schemas. Instead of being resolved by dialectical processes, identity ambiguity was resolved by sensegiving interventions by change leaders.

However, radical departures from the past do not necessarily render pre-existing schemas obsolete. Thompson (2006) studied the imposed division of a public sector organization into owner organization and provider organization, a radical departure from prior organizational arrangements. As in Balogun and Johnson's (2004) study, the managers and staff in both owner and provider organizations had to 'sense-make' with less sensegiving from the top, a result of organizational dispersion and the complexity of the new schema. However, unlike Balogun and Johnson (2004), the pre-existing schema was not rendered obsolete; it still exerted a powerful influence on organizational members' perceptions and behaviour, reflected in frequent reports of regression as managers and staff sought to force a return to traditional ways of working. Instead, old and new schemas appeared to be operating simultaneously, creating cognitive dissonance and organisational stress. Rather than schema replacement there were frequent reports of regression as managers and staff sought to force a return to traditional ways of working, and in some respects this return was achieved.

The idea that radical change makes replacement sequence more likely is also questioned by Reger *et al*. (1994). Reger et al (1994: 574) suggest that successful change leader interventions designed to embed TQM and the associated change in self schemas (organizational identity) is contingent on width of identity gap, 'the cognitive distance between the perception of the current and the ideal identity.' Specifically, they argue that

radical departures from the past constrain change in two ways; they increase the likelihood that organizational members will fail to comprehend the new arrangements, and they increase the likelihood that such interventions will oppose positively-held core organizational identity values (572). Instead, they argue that change 'should proceed through mid-range modifications that motivate the organization to change; it should not be so radical that organizational members either fail to comprehend the change or perceive it to be unacceptable' (566).

The frame-disengage-learning dynamic has been given little attention in the literature and deserves greater attention. Rendering pre-existing schemas obsolete is akin to functionally deleting the old organizational schema from memory and building a new schema on the basis of experience. The limited evidence presently available is conflicting and incomplete. At the very least the limited existing evidence suggests the need to investigate the micro- and macro-processes that make successful schema replacement more likely.

Thompson and Hunt analysis

As in our earlier analysis, the relationship between Thompson and Hunt's model of individual cognitive processing and the schema change outcome reported by Balogun and Johnson is not clear cut. From Thompson and Hunt's perspective, schema obsolescence created by change leaders' intervention would involve a level 3 cognitive decision that prior knowledge, non-evaluative and evaluative beliefs and subordinate values are irrelevant to sensemaking in the new environment. As in our earlier discussion, how this outcome can be explained in terms of individual level schema change dynamics poses significant conceptual problems. Nevertheless, some data support this view. At the very least more research should be devoted to understanding how this outcome occurs.

Summary

Our analysis suggests two main pathways involved in leader-drive schema change. In the first path, the change leader frames a new schema, juxtaposes this alterative with the pre-existing schema and then seeks to transition organizational members from the pre-existing to the new schema. The second leader-driven schema change path involves the change leader intervening in ways that disengage or render the pre-existing schema obsolete or irrelevant (Balogun and Johnson, 2004; Corley and Gioia, 2004). A tentative analysis of the results of prior research in the light of Thompson and Hunt's conceptual model of individual cognitive change suggests the need for consideration of the relationship between the social dynamics of schema change and schema construction at the individual level. Schema change at the individual level involves high level reasoning and cognitive effort, suggesting the need for interventions that facilitate these processes.

Theoretical Issues and Directions for Future Research

The analysis of schema change interventions in this paper has several important implications for schema change theory. First, more attention needs to be given to determining what the concept of schema change means and what constitutes evidence of successful schema change. There is some variation of perspective in the studies reviewed here. Definitions of schemas imply that they are composed of beliefs linked by associative networks (Fiske and Taylor, 1991) which suggests they form, with a reasonable knowledge of the particular domain, a gestalt. If so, then schema change, from the perspective of organizational transformation, would require not just change in single beliefs, but change in a complex system of beliefs and values that make up the schema. The evidence for change at the level of schema gestalt is difficult to glean from the existing research.

Second, how can schema and schema change be represented and measured? Various schema change outcomes are reported in the literature such as synthesis and replacement. How we define schema change has implications for the speed and the likelihood of change. Some researchers showed the progressive development of schema over time (Balogun and Johnson, 2004). However, others found little evidence of progressive development. It seems that organizational members quickly developed a position on the change and their emerging outcomes, and maintained this initial position for at least three years (Thompson, 2006) and sometimes ten years (Westenholz, 1993). It is not year clear how this variation might be explained.

Third, how do schemas change? The current focus on social processes of schema change tends to ignore individual level processes (Maitlis and Lawrence, 2007). Sensemaking and schema change involves both individual and social processes (Weick, 1995). Little attention has been given to understanding what happens at the individual level schema (Thompson and Hunt, 1996) or the relationship between social and individual level schema change dynamics. The two levels of analysis are interdependent, and it may be difficult to consider one without the other (though see Labianca et al, 2000 for an alternative view).

At the level of the individual, schema change will not occur unless the change-relevant schemas are activated and the individual is motivated, and open, to process new information to test pre-existing schemas. This issue relates to what triggers activation of change relevant schemas. Furthermore, once activated, it is important to understand the factors that make it more likely that information will be processed in ways that result in schema change. All of the studies reported here suggest that some form of comparison between pre-existing and new

schemas occurs. Consequently, it appears that schema change involves high levels of cognitive processing and cognitive effort (Thompson and Hunt, 1996). However, little attention is given to determining the high level cognitive processing and cognitive effort required in schema change, the emotional demands of such change and their implications for the design of schema change interventions.

Fourth, most of the studies reported here imply that a crisis activated schemas and triggering schema change. Presumably crises force organizational members to attend to transformation salient schemas. However, Gioia and Chittipeddi (1991) suggest that crisis is not necessary. They propose ambiguity-by-design might be an alternative trigger. Given the importance of activation in schema structures for change, the conditions under which schemas are activated would appear to be an important area for research.

Fifth, what change leader interventions are most likely to influence individuals to activate schemas and expend the level of effort required to process information to confirm or disconfirm their pre-existing schemas? At one level, any intervention that results in the activation and comparison of old and new schemas may be involved. The studies reported here focus on coercion (Poole, Gioia and Gray, 1989), structural change (Balogun and Johnson, 2004; Bartunek, 1984), facilitated workshop (Labianca, Gray and Brass, 2000), the creation of conflict arenas (Dent, 1992), giving 'space for thought' (Thompson and Hunt, 1996) and creating opportunities for participation (Bartunek, 1984).

Mostly, these interventions have proved to lead to successful schema change (Bartunek, 1984; Labianca, Gray and Brass, 2000). However, the more general conceptual literature tends to question the efficacy of such interventions (Maddock, 2002; Mckinley, 2000;

Schofield, 2001; Stokes and Clegg, 2002). The reconciliation of these findings requires some attention. Structural interventions are not the only options available to change leaders (Porras and Robertson, 1992). The education literature focuses on developing schema through instruction. In addition, little attention is given to the efficacy of large-scale human process interventions (Waddell, Cummings and Worley, 2004) for achieving collective schema change.

Sixth, what role does the context have on schema change? In some cases, change interventions must influence schema change contexts that are inimical to the influence of change leaders, for example, spatially differentiated technically-oriented professional organizations (Balogun and Johnson, 2004; Thompson, 2006). Geographical distance from change leaders and a professional workforce tend to be neutralizers of leader influence (Cummings, 1999; Kerr and Jermier, 1978; Mintzberg, 1989), and result in top level leaders being less effective in sensegiving. In addition, some organizational environments are conflict averse, even when that conflict can be functional. How do change leaders in such contexts provide opportunities for conflicting perspectives to be aired in ways that reveal, test and change schemas?

Conclusion

Successful organization transformation relies on changing the individual and collective cognitive structures or schemas that reinforce pre-existing organizational arrangements. However, little explicit research has focussed on leader-driven schema change. This paper has focused on the most important papers addressing this issue. It has been acknowledged that the scope of the existing research is limited by the diversity of alternative labels for the cognitive structures we refer to as schemas (Walsh, 1995). If this analysis had included the

research addressing the more than seventy labels, a more complete picture might have been

possible. Construct diversity highlights the difficulty in specifying the concept of schema for

research purposes. This lack of attention is surprising; given the critical role schema change

is thought to play in OT (Bartunek and Moch, 1987).

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