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The Microfoundations of Recurrent Action Patterns

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Abstract

Investigations of the microfoundations of recurrent action patterns?which encompass individual habits as well as the collective performance of routines, administrative procedures and systematic processes?typically assume trait-based, behaviorist or type theories of personality and individual psychology. However, a number of leading psychologists reject such theories as over-simplifications. They propose, and my paper adopts, a novel social cognitive theory of human personality and individual psychology. From this alternative perspective, context and situational contingency become central factors in the explanation of recurrent action. Complex intra-psychic processes also play a central role. My paper builds upon such a perspective to explain the microfoundations of recurrent action in terms of the complex interactions between situational contingency and psychological processes. The resulting theory proposes that habits, routines and other types of collective performance evolve from patterns of situated behavior that are mediated by intra-psychic cognitive-affective processes. Among its major contributions, my theory offers an explanation for the development and adaptation of habits and collective performance. In doing so, my theory resolves a number of persistent questions regarding the mechanisms whereby recurrent individual behaviors or habits are transformed into collective performance such as routines. I conclude the paper with a discussion of implications for future research into organizational routines, learning and change, and the behavioral tradition of organization and management theory.

THE MICROFOUNDATIONS OF RECURRENT ACTION PATTERNS

ABSTRACT

Investigations of the microfoundations of recurrent action patterns—which encompass individual habits as well as the collective performance of routines, administrative procedures and systematic processes—typically assume trait-based, behaviorist or type theories of personality and individual psychology. However, a number of leading psychologists reject such theories as over-simplifications. They propose, and my paper adopts, a novel social cognitive theory of human personality and individual psychology. From this alternative perspective, context and situational contingency become central factors in the explanation of recurrent action. Complex intra-psychic processes also play a central role. My paper builds upon such a perspective to explain the microfoundations of recurrent action in terms of the complex interactions between situational contingency and psychological processes. The resulting theory proposes that habits, routines and other types of collective performance evolve from patterns of situated behavior that are mediated by intra-psychic cognitive-affective processes. Among its major contributions, my theory offers an explanation for the development and adaptation of habits and collective performance. In doing so, my theory resolves a number of persistent questions regarding the mechanisms whereby recurrent individual behaviors or habits are transformed into collective performance such as routines. I conclude the paper with a discussion of implications for future research into organizational routines, learning and change, and the behavioral tradition of organization and management theory.

Recurrent action patterns are embodied in the habits of individuals and the collective performances of groups and organizations, where collective performances include routines, administrative procedures and systematic processes (Cohen, Levinthal, & Warglien, 2014). Indeed, habits underpin the stabilities of personality, while collective performances such as routines underpin the stabilities of organization (Mischel, Shoda, & Mendoza-Denton, 2002; Winter, 2013). Moreover these two categories of recurrent action are closely related: collective performances can be defined as the group-level expression of shared habits (Cohen et al., 2014). Moreover, through the variation and recombination of personal habits and collective performances, individuals, groups and organizations develop new characteristics and capabilities (Nelson & Winter, 1982; Rerup & Feldman, 2011). The adaptive potential of recurrent action thus enables change and novelty for both persons and collectives (Feldman & Pentland, 2003; Glăveanu, 2012). Not surprisingly, given these functions, scholars seek to explain the origins of recurrent action patterns. In doing so, many look to microfoundational processes of behavior and cognition (e.g., Abell, Felin, & Foss, 2008). By understanding such microfoundational processes, scholars hope better to explain, predict and manage the development and adaptation of recurrent action patterns. However, dilemmas persist. Scholars continue to ask how individual habits can be transformed or aggregated into collective performances, and how individual learning and knowledge are embedded into procedural memory and then retrieved in collective action (e.g., Cohen et al., 2014; Tobias, 2009). My conceptual paper addresses these questions, and like other scholars, I argue we must adopt a fresh perspective on individual personality and psychology. We need to reform the psychological foundations of microfoundational theories, ensuring they are "more extensively grounded in sound contemporary psychology" (Cohen et al., 2014: 334). Indeed, research into microfoundations requires us to revisit the fundamental mechanisms

whereby the complex cognitive and affective features of personality influence behavior and evolve over time. As Winter (2013: 126) writes, we need "microfoundations that offer an alternative to the standard brand "individuals" of economic theory."

Central to my argument, therefore, is a revision of the dominant psychological theories which characterize research on microfoundations, namely trait-based, behaviorist and type theories of personality (Cohen et al., 1996; Klein, Tosi, & Cannella Jr, 1999; Winter, 2011). In contrast, I adopt an alternative social-cognitive perspective advocated by a number of leading psychologists (Cervone, 2005; Shoda, LeeTiernan, & Mischel, 2002; Wood & Beckmann, 2006). Notably, and in contrast to other theories of personality, social-cognitive theories reconfigure personality as situated, contextual and mediated by complex intra-psychic processes (Mischel, 2004). From this perspective, stable patterns of individual personality are not determined by universal traits such as neuroticism or extraversion, nor by pre-existing types such as introversion, nor by external stimuli, but rather by more complex processes involving lower order social-cognitive and affective processes. Observed stabilities of personality can then be understood as recurrent patterns of situated behavior, mediated by complex intra-psychic processes. In fact, personality traits and types can then be viewed as epiphenomenal relative to the underlying intra-psychic processing system. The focus of analysis thereby shifts towards more complex interactions between cognitive-affective systems and the situational context. I will argue that the same situated psychological processes also constitute the microfoundations of habits, routines and other types of collective performance (see Cohen et al., 2014).

Furthermore, the social-cognitive conceptualization of personality obviates the need to aggregate individual traits or behaviors when explaining the microfoundations of collective performance. This benefit is achieved because the exact same processing systems are common to

the architecture of individual habits and collective performance when viewed through a behavioral lens. No aggregation is required. Individual and collective performances are co-existent and co-evolve. The resulting theory therefore integrates related features of both psychological and organizational phenomena. It conceives of individual persons and organized groups as interacting, mediated systems of situation-behavior processing. The theory also stresses the situational context of recurrent action and habit formation (Cohen et al., 2014). Assuming these principles, my theory proposes a deep complementarity between personality, individual habits and collective performances, including routines. Personality is socially situated, and organizational groups are personally embedded (Brewer, 2004; Cacioppo, 2004; Cervone, 2000).

The rest of the paper expands the foregoing arguments. To begin with, I review the background literature on individual personality, habit and collective performance. Building on this literature, I develop a new theory of microfoundations, linking together these three levels of analysis. Finally, I discuss the implications for future research into the microfoundations of recurrent action patterns, learning and change, and the behavioral traditional of organizational and management theory.

HABITS AND COLLECTIVE PERFORMANCE

Much individual and collective action is repetitive and involves minimal deliberation. When performed by individual persons, such actions are typically labelled habitual (Duhigg, 2012). At the level of collective performance, they include organizational routines and administrative procedures (Cohen et al., 2014). The obvious point is important: both habits and collective performances are recurrent action patterns that require little if any deliberation. Moreover, individuals who behave habitually also behave collectively, and often at the same

4

time. Indeed, a particular recurrent action may be simultaneously viewed as personal habit and collective performance: habit when viewed in relation to a pattern of individual behavior, and collective performance when viewed in relation to a pattern of group behavior (ibid). It is the level of analysis that distinguishes the two interpretations, and their integration is difficult to explain. Indeed, among the more intractable problems in research on these phenomena is how to link both levels of analysis and explain how individual habits transform into collective performances (Winter, 2013). Various attempts have been made to answer the question. A popular approach is to propose aggregation mechanisms, whereby the individual habits of a group of individuals somehow accumulate into collective performances (Felin & Foss, 2009). Yet scholars have yet to fully specify and explain such aggregation mechanisms.

Hence, a major challenge for microfoundational theories is to integrate different levels of analysis, and specifically the levels of individual habit and collective performance. Inappropriate reductionism is common. On the one hand, in some accounts, individual psychological processes are viewed as fundamental and collective performances are reduced to epiphenomenal status. On the other hand, alternative treatments view organizational forms and collective performances as fundamental and individual psychology is secondary or ignored. Both extremes exhibit an equal degree of ontological poverty. Complex realities are obscured. Trait-based, behaviorist and type theories of individual psychology reinforce these errors by virtue of their emphasis on stable, universal characteristics at one or other level of analysis. The deeper and more important challenge is to explain how individual and group-level processes co-evolve and interact within social and organizational contexts. This calls for a more pluralistic ontology, in which no single level of observed reality is privileged over others, whether at the individual, group or organizational level (Winter, 2013).

Recurrent actions also vary in terms of automaticity. Many habitual and collective performances are effectively unconscious, involving very little deliberate intervention (Bargh & Williams, 2006). Recent neurological studies show this is clearly the case. For example, brain injured patients with significant loss of memory and deliberative capacities can still acquire new habits and perform them unconsciously and automatically (Duhigg, 2012). At the same time, other habits and collective performances may exhibit some degree of conscious deliberate processing (Glăveanu, 2012; Zollo & Winter, 2002). However, overall, habits and collective performances, by virtue of their recurrent nature, tend towards less deliberative processing. They are typically procedural and require limited mindfulness and effortful control (Levinthal & Rerup, 2006; Verplanken, Friborg, Wang, Trafimow, & Woolf, 2007).

That said, evidence suggests that individual habits and collective performances exhibit a range of deliberate or conscious intervention. While many are automatic, others are somewhat deliberative. So once again, the observed realities of human behavior are more complex, nuanced and contextual than often suggested, especially by trait-based, type and behaviorist theories. Any account of the microfoundations of recurrent action patterns must therefore be grounded in a theory of individual psychology that accommodates these complexities.

Psychological assumptions

In order better to explain the microfoundations of recurrent action patterns, it is first necessary to revisit and revise the underlying psychological theories that support these efforts. We need to examine whether or not assumed major theories of individual psychology—and specifically trait-based, behaviorist and type theories—are suited to the task of explaining these complex phenomena. In fact, too often, assumed psychological theories have blinded researchers to the deeper complexities of human personality and behavior. For example, such theories often

obscure the role of emotion in cognition, the contextual nature of personality, and the continuum of automaticity and deliberation in human behavior (Cohen, 2006; Fiedler & Wanke, 2009). Leading social cognitive psychologists therefore question the overall validity of trait-based, behaviorist and type theories (and especially popular trait-based theories), and regard them as over-simplifications (Cervone, 2005; Mischel, 2004; Wood et al., 2006). Instead, these scholars argue for more complex theories in which contextual and intra-psychic factors constantly interact, and they reject theories which assume stable, universal determinants of individual personality. Some organizational scholars argue likewise with regard to the assumed microfoundations of collective performances such as routines (Cohen et al., 2014; Winter, 2013).

The most widely adopted theories of individual psychology are the trait-based, behaviorist and type theories of personality. Each presents a strong position on a particular type of determinant. Firstly, trait theories argue that there are a set of universal personality characteristics or traits, such as neuroticism and conscientiousness, which all people share in varying combinations and degrees of intensity (McCrae & Costa, 1997). Individual difference is then explained by the variable combinations of these traits. Secondly, behaviorist theories argue that personality is derived from repeated responses to external stimuli, and not by virtue of inherent traits or cognition. And thirdly, type theories argue that each person exhibits one or other type of personality, such as being an introvert or extrovert. Yet each of these theories is arguably narrow in conception and ignores the deeper complexities and individual psychology (Cervone, 2004).

Behaviorist theories of personality classically assume that the explanation of human behavior can be developed solely from observation without recourse to internal mental states (Skinner, 1953). Individual characteristics are thought to result from repeated behavioral

responses to the stimulus environment (Watrin & Darwich, 2012). Recurrent patterns of contextual stimuli may then result in the observed stabilities of personality, while the ubiquitous variance in stimuli is said to explain individual difference. Such theories were widely adopted in the mid-twentieth century, but support subsequently waned. Discoveries in cognitive science and other areas of psychology exposed the inadequacy of purely behaviorist accounts. In more recent literature, therefore, the limitations of such accounts are broadly agreed: purely behaviorist theories neither accommodate nor account for the observed significance of individual motivation, emotion, cognition and intra-psychic complexity within human personality. That said, the influence of behaviorism lingers in debates on the microfoundations of routines and capabilities (Felin et al., 2009; see Winter, 2011).

Type theories, in contrast, argue that personality is largely determined by intra-psychic typologies. Within this school of thought, people are, for example, either introverts or extroverts. Other categories are identified, for example, within the widely adopted Myers-Briggs classification system. Indeed, the use of this system remains widespread in the management literature, thereby perpetuating type theories of personality in management and organizational research (e.g., Beckman & Barry, 2007; Bendoly, Thomas, & Capra, 2010). However, type theories are equally limited over-simplifications. They downplay the significance of both situational factors and the internal complexities of intra-psychic processes.

Trait-based theories share similar limitations. In trait-based theories, persons are not categorized in terms of broad types, but assumed to possess a fixed set of universal characteristics or traits in variable combinations. The most widely employed version of trait theory is McCrae and Costa´s (1997) Five Factor Model (FFM). Their five traits being: neuroticism, extraversion, openness to experience, agreeableness and conscientiousness. Human

personality is conceived as a blend of the aforementioned traits, with each trait capturing a fundamental feature of individual difference (McCrae & Terracciano, 2005). The FFM model has had a profound and enduring influence on research into organizational behavior and management. Scholars have employed the FFM of personality to investigate many topics, including executive leadership (Hiller & Hambrick, 2005), network behavior (Totterdell, Holman, & Hukin, 2008), entrepreneurship (Das & Teng, 1997) and job satisfaction (Judge, Heller, & Mount, 2002). In fact, the FFM theory of personality has attained normative status within management and organizational studies and few would question its validity and use. However, viewed from the FFM perspective, it is difficult to explain the transformation or aggregation of individual-level traits into organizational forms such as collective goals, routines and capabilities. This is because traits are conceived as stable intra-psychic characteristics at the person level, independent of social mechanisms and situational factors (Mischel, 2004). Patterns of behavior that appear discordant with dominant traits are therefore viewed as evidence of deviance and psychic abnormality (see March, 2010). Variance is problematized. Researchers then try to uncover reasons why individuals deviate from assumed norms (Wood et al., 2006). Important phenomenal richness is sacrificed for the sake of assumed theory.

In contrast, from a social-cognitive perspective, observable variance in human personality is fundamental and evidence of the inherent contextuality and complexity of individual psychology (Cervone, 2005). Psychological functioning is thus viewed as highly contextual and interactive, entailing external stimuli, the activation of intra-psychic processing and resultant behaviors. Social cognitive theories acknowledge the fundamental nature of person-situation interactions, the contextual dynamic of personality, and advocate a closer synthesis between personality and social psychology (Bandura, 2006; Brewer, 2004). Mischel and Shoda´s (1995,

1998) Cognitive-Affective Processing System (CAPS) theory of personality is a leading example of such an alternative.

The CAPS Theory of Personality

Mischel and Shoda propose a theory of personality in terms of the distinctive interrelations among cognitive and affective processes and the psychological features of situations. Put simply, situational features trigger complex mediating cognitive-affective processes which result in behaviors. In explaining their theory, they analogize to the development of cognitive science and computing in the late twentieth century: the CAPS model "is consistent with a new kind of revolution that has been occurring in cognitive and neuroscience in the last decade which shifts from the serial, centralized processing that had been modelled after the architecture of traditional digital computers to a more paralleled, distributed model" (Mischel et al., 1995: 253). However, Mischel and Shoda´s thinking about "situation" and "stimulus" differ from behaviorism. Situational stimuli are not the sole determinant of personality and behavior; behavioral responses are not mechanical results of conditioning. Rather, features of situations activate complex and variable intra-psychic processes within persons, both cognitive and affective, which reflect a person´s prior experience and dispositional characteristics. The five categories of cognitive-affective mediating units in the CAPS theory are detailed in Table 1: encodings of the self and social world, expectancies and beliefs, affects and emotional responses, goals and values, and competencies and self-regulatory plans.

Insert Table 1 about here

Adopting this perspective, Mischel and Shoda conceive of individual personality as a situation-behavior system (or a system of "if…then..." situation-behavior responses), mediated

by an organized network of cognitive-affective processing units which are more fundamental than traits. That is, an organized system of cognitive-affective processes, rather than a fixed set of universal traits, mediates the functioning of individual personality. And while broad behavioral similarities exist between persons, each person possesses a unique, relatively stable cognitive-affective system which reflects the nature and degree of her or his individual difference. It is these cognitive-affective processing systems which underlie individual uniqueness, rather than presumed personality traits or types. In fact, Mischel and Shoda (1995: 151) argue that traits are over-simplified descriptions of widely shared and relatively stable patterns of cognitive-affective processing:

"when personality is conceptualized as a stable system that mediates how the individual selects, construes, and processes social information and generates social behaviors, it becomes possible to account simultaneously for both the invariant qualities of the underlying personality and the predictable variability across situations in some of its characteristic behavioral expressions."

Figure 1 shows a schematic version of the CAPS personality system. Features of situations stimulate responses in the form of cognitive-affective processes, which in turn result in behavioral outcomes. The specific connections within the processing system are chosen arbitrarily to demonstrate the principles of the model. The Figure illustrates that (a) there are many possible relations among the cognitive-affective units but only some are functionally important; (b) cognitive-affective units become activated in relation to situations and to other units in the personality system; (c) feedback activations occur that produce and sustain patterns of activation over time; and (d) units that become activated in the personality system activate

other units through their distinctive organization in a network of relations, ultimately generating observable behaviors (Mischel et al., 1995).

Insert Figure 1 about here

Furthermore, classes of situations often exhibit very similar features which allow for categorization of responses across occurrences. For example, while every game of chess is different in some respects, all are games of chess and exhibit the same basic situational features. In response to these similarities, groups of people possess similar cognitive-affective processing patterns and thus display similar behavioral dispositions when playing chess (Cohen et al., 2014). Moreover, when viewed across a population of individuals and situational contexts, similar processing patterns approximate the appearance of universal personality traits (Mischel et al., 2002). The trait interpretation thus assumes (naively, according to Mischel and Shoda) that some processing units are constant, relative to the universal population of persons, although the input stimuli and output behaviors may vary widely.

In summary, commonly assumed theories of personality—whether trait-based, behaviorist or personality type theories—fail to capture and explain the inherent variability, complexity and contextuality of personality and individual psychology. In contrast, the CAPS theory does embrace inherent variability, complexity and contextuality, explaining individual personality in terms of patterns of situation-behavior responses, mediated by cognitive-affective processing systems. Individual differences in personality are thus re-conceived as variable patterns of cognitive-affective processing, rather than as universal traits or types. Indeed, variance is inherent to the CAPS model, both within and between persons. Notably, these features of the CAPS theory also correspond with the fundamental principles for

microfoundational models of collective performance proposed by Cohen, Levinthal and Warglein (2014: 343): "perceived situations, actions represented as functions, and activated-ends."

THE MICROFOUNDATIONS OF RECURRENT ACTION

Evidence shows that groups of persons often exhibit very similar patterns of situational stimulus and behavioral response. In similar situations, therefore, a population of individuals may share a core subsystem of consistent processing units, even if their overall cognitive-affective processing systems differ (Mischel et al., 1995; Shoda & Mischel, 2006). The mediating cognitive-affective processes of most if not all occurrences of a particular type of situation-behavior system include the same cognitive-affective subsystem, thus defined as being core to these systems. For example, almost every person who plays a game of chess shares a common, core subsystem of goal pursuit processes directed at winning the game. Figure 2 depicts such assumptions. The first stage of the model (labelled "Features of situations" and indicated by the letters "a...g") is similar to the base CAPS model, where features of situations may include a variety of organizational characteristics or other social and environmental stimuli. In the second stage of the model (labelled "Cognitive-affective processes") cognitive-effective processing units mediate three individuals' personality systems (labelled A, B and C). The heavy black line outlines the personality system of a single person B – it encompasses a full set of situational inputs, mediating intra-psychic processes for person B, and a full set of resulting behaviors. The heavy black line therefore outlines a system equivalent to that depicted in Figure 1. Furthermore, similar cognitive-affective processing subsystems occur for both individuals and groups of persons (Mischel et al., 1995). Assuming this to be the case, the second stage of the model in Figure 2 shows the processing similarities between persons A, B and C. Stage three of

the model depicts the emergence of a set of outcome behaviors (labelled "Recurrent behaviors" and indicated by the letters "m...s").

Insert Figure 2 about here

The microfoundations of habits

Figure 2 also depicts individual habits. Habits can be viewed as a subset of an individual´s overall situation-behavior responses. That is, instead of all situation-behaviors for a person, consider the case of a specific situation-behavior subsystem. This condition is depicted by the dotted line shape in Figure 2. In this case, specific situational features ("c" and "d") trigger cognitive-affective processing within person B, which in turn generates a behavioral response ("p" and "o"). Many examples of this type of situation-behavior occur for any individual: when the pedestrian traffic light turns green, most people cross the road; and when the telephone rings, the majority of people answer it. Indeed, consistent habitual responses to situational stimuli are universally observed. Yet internal to the personality system, the processing units may or may not be identical across all instances. For example, crossing the road at traffic lights may entail significant goal-related processing on some occasions, but not always; while a ringing telephone may sometimes trigger strong affective processing, and other times not. Therefore, just as personality systems are responsive to situational context, individual habits are initiated by recurrent situational stimuli as well. As Winter (2013: 133) writes, "Habitual behavior is evoked by contextual cues, and the fact that some of the cues flow interpersonally in an organizational situation does not by itself impose novel requirements on the habitual behavior of an individual." Features of situations may include a variety of organizational characteristics or other social stimuli. In summary, the CAPS model can be adapted to model habitual behavior by

an individual, simply by holding a specific situation-behavior pattern relatively stable for that individual. Figure 2 also depicts the historical feedback processes whereby the triggers of habitual behavior are embedded into the individual´s situation-behavior response system.

Moreover, some behavioral responses may be effectively automatic, in that little deliberate intervention occurs in their enactment (Bargh et al., 2006). That is, some behaviors are not significantly mediated by deliberative processing, but rather by non-deliberative cognitive-affective factors, such as affective or construal processes. Habits are exactly this type of system (Wood, Quinn, & Kashy, 2002). For any individual, his or her habits are consistent situation-behavior response patterns, triggered by environmental cues, and mediated by largely non-deliberative cognitive-affective processing (Duhigg, 2012). Importantly, the same is true of situation-behavior responses in the CAPS model of personality.

However, while claiming that habits entail less deliberative processing within situation-behavior responses, I do no thereby assert that habits are strictly and always non-deliberative. There can be habits of mind, after all. Nor do I thereby subscribe to strict dual processing theories, in which emotive and intuitive processes are classified as distinct from deliberative and calculative processing (e.g., Kahneman, 2011). Rather, I subscribe to the view that cognitive-affective processing styles are integrated and complex, in which different degrees of calculative and emotional processing take place, resulting in variable patterns of associative and deliberative information processing, depending on the situational context, capability of the agent and related ecological factors (Cervone, 2005; Fiedler et al., 2009). For the same reason, I do not assume that habits are necessarily accompanied by non-deliberative, purely associative modes of reasoning (cf. Winter, 2013); rather, I argue that habits are typically accompanied by little if any deliberative processing.

15

The microfoundations of collective performance

Next consider the case where specific patterns of situational stimulus and behavioral response are relatively stable and consistent for a group of individuals. In other words, where there is a collective pattern of habitual situation-behavior, entailing a common core subsystem of cognitive-affective processing. In this case, we require the set of shared habits depicted by the dashed line shape in Figure 2. The shape encompasses the group of people (A, B and C). Each person possesses a similar situation-behavior response pattern. Such phenomena occur frequently among groups of people: for example, when the school bell rings, most student members of a class will typically enter or leave the classroom; or when a delivery of parts arrives at a factory, the responsible members of a work team will unload and store the inventory. A core subsystem of situation-behavior processing is common to all. Yet their overall processing units are rarely identical: leaving the classroom may entail significant affective processing for some students, but not all and not always; unloading inventory may sometimes trigger significant encodings of the self and social world for some workers, yet not consistently. That is, while the core situational stimuli, cognitive-affective processes and habitual behaviors may be equivalent, overall intra-psychic processes often vary between persons. In summary, recurrent habitual behaviors viewed at the group level are collective performances. In this way, recurrent action patterns such as routines can be understood as a sub-set of the habits of a group of individuals, where specific situational features, core cognitive-affective processes and behavioral responses are consistent and relatively stable for the group, even if their overall intra-psychic cognitive-affective processes remain heterogeneous (cf. Cohen et al., 2014).

However, collective performances are not simply an aggregation of habits. The situational stimuli and behavioral responses of collective performance may be almost identical.

16

But as explained above, collective performances need not entail the same overall patterns of intra-psychic processing as habitual behaviors. Rather, collective performances share a core subsystem of cognitive-affective processes. For any group of individuals, therefore, their shared collective performances can be conceived as consistent situation-behavior response patterns, mediated by a core subsystem of largely non-deliberative cognitive-affective processing units. It should also be noted that while this modelling entails the reduction of assumed traits and behaviors, it does not imply any loss of personal autonomy and intentionality. Indeed, the CAPS theory enhances the inherent degree of intra-psychic variability and self-regulation (Shoda & Mischel, 2000).

Figure 2 again depicts the historical feedback processes whereby collective performances are embedded into the situation-behavior system for the group. This embedding process is in addition to the storage of related procedural memories by individual actors (Cohen & Bacdayan, 1994). Group embedding occurs as the situational features (behavioral triggers) are translated into social and organizational form, recorded and exemplified in material artefacts, data stores, technological systems, cultural forms and operating procedures (Dosi & Marengo, 2007; Nelson et al., 1982; Winter, 2013). Indeed, organizations embody the situational features which trigger cognitive-affective processing and result in specific collective performances. Moreover, such embodiment mirrors the processing units of the CAPS model: encodings of the self and social world, expectancies and beliefs, affects and emotional responses, goals and values, and competencies and self-regulatory plans (Mischel et al., 1995). And notably, each processing category has already been shown to play a significant role in the development and activation of routines as a type of collective performance: organizational and social identity (e.g., Kane, 2010; Kane, Argote, & Levine, 2005), shared beliefs and expectations (e.g., Levitt & March, 1988;

17

Tripsas & Gavetti, 2000), affects and emotional responses (e.g., Cohen, 2006; Lazaric & Denis, 2005), organizational goals and values (e.g., Winter & Szulanski, 2001), and organizational competencies and regulatory regimes (e.g., Becker, Lazaric, Nelson, & Winter, 2005; Pentland, Feldman, Becker, & Liu, 2012).

Finally, because the collective performance depicted by the dashed line shape in Figure 2 is grounded in shared situation-behavior systems, there is no need to explain the aggregation of habits. Rather, habits and collective performances are grounded in a common ecology of situation-behavior systems which include shared over-lapping cognitive-affective processing subsystems (Shoda et al., 2006); although these subsystems certainly differ in terms of the level of analysis and the related degree of processing stability or variability. For similar reasons, the model in Figure 2 entails neither methodological individualism nor reductionism, but rather assumes ontological pluralism. Personalities, individual habits and collective performances are depicted as situated subsystems of a wider social ecology of situations and behaviors.

The microfoundations of change and adaptation

As noted previously, variation is inherent in the CAPS model of personality (Mischel et al., 1998). Variations arise from the dynamism of situational stimuli and the complexity of individuals´ cognitive-affective processing systems. Therefore, each instance of a situation-behavior response can vary, for either a single individual or group. At the same time, there are categories of situation-behavior responses which possess the same core elements. At least some features of situations, cognitive-affective processing units and behavioral outcomes are relatively stable and consistent across most occurrences. For example, when crossing the road at traffic lights, the broad physical features of traffic lights are typically constant, as are the encodings which pedestrians have about such technologies and the resulting behavior of crossing the road.

Moreover, for any category of situation-behavior systems, the core situational features and behavioral outcomes may be relatively constant for all level of analysis: traffic lights are traffic lights, and crossing the road is crossing the road, whether viewed in relation to an individual habit or collective performance.

However, as in the original CAPS model of personality, there is greater variance between habit and collective performance in terms of intra-psychic cognitive-affective processes. At the level of an individual habit, the core cognitive-affective processes encompass a relatively complex sub-set of a person´s total processing units, potentially including specific affects, goals, values, encodings and competencies. At the level of collective performance, however, the consistent cognitive-affective processes are less expansive and encompass only those processing units which are common for all actors; that is, at the level of collective performance, the common cognitive-affective processes are a subset of each individual´s habit system, and do not include the same specific affects, goals, values, encodings and competencies.

Important consequences flow from these patterns of variation and stability between cognitive-affective subsystems. To begin with, the greater the overlap between core processes across levels, the more deeply embedded the system will be in psychological terms. For example, if some core features of a person´s personality system are equally core features of a specific habit and collective performance, then that habit and collective performance will be a more deeply embedded characteristic of the person´s behavior. Actors will experience the habit and collective performance more intensely, given its deeper integration into personality. For the same reason, the relevant habit and collective performance will become more difficult to change, because any change entails a concomitant change to the person´s personality system. In fact, these effects are

demonstrated by studies of social identity in relation to the development of routines, in which challenges to identity make routinization less likely (Kane et al., 2005).

Figure 3 depicts these effects. It shows two versions of a person´s cognitive-affective processing system. In the first version (labelled S_1), the cognitive affective processes associated with a collective performance (labelled C_1) overlap substantially with habit (labelled H_1), which in turn overlaps significantly with personality (labelled P_1). Each level shares a relatively significant subsystem of cognitive-affective processes. Hence, the related behaviors are more deeply embedded for that person and more difficult to change. By contrast, in the second version of the person´s cognitive-affective processing system (labelled S_2), the cognitive affective processes associated with a collective performance (labelled C_2) overlap only partially with habit (labelled H_2), which in turn overlaps only partially with personality (labelled P_2). In this case, the related behaviors are less deeply embedded for that person and therefore easier to change.

Insert Figure 3 about here

A second consequence of these dynamics relates to the explanation of behavior at each level. In summary, the role of core cognitive-affective processes in recurrent action patterns is only partially translatable across levels: what is core for personality may not be core for habit, and what is core for habit may not be core for collective performance, despite the fact that each is triggered by the same situational features and may result in the same behavior. The explanation of collective routine performance will therefore entail a limited core of cognitive-affective processing units, such as those processes relating to collective identity, beliefs, values, goals, affects and competencies. While at the level of individual habit, the same situation-behavior may entail a far richer core encompassing more of the person´s intra-psychic cognitive-

affective processing system, encompassing personal identity, beliefs, values, goals, affects and competencies. It therefore follows that any explanation of collective performance at the group level will rarely if ever require the same complexity of psychological detail as the explanation of individual habitual action. That is, the microfoundations of individual habits are not fully incorporated into the microfoundations of collective performance.

Evidence of these effects already exists. Within the field of microeconomics, for example, population level theories of rational choice as collective performance only capture a minimal core of cognitive-effective processing; yet at the individual level, theories of rational choice entail more complex cognitive-effective processes (Kahneman, 2011). Similarly, extant behavioral theories of individual level choice are typically inappropriate at the population level, because they capture an overly rich core of cognitive-effective processes which is not shared at the population or group levels (March, 2014; Mazzoleni & Nelson, 2013). Comparable dilemmas exists within organizational and management theory, where scholars distinguish and seek to integrate the micro-level analysis of individual behavior, with macro-level theories or organizational behavior (Gavetti, Levinthal, & Ocasio, 2007; Greve, 2013). Indeed, identifying the mechanisms of interaction between micro and macro levels of analysis is one of the central challenges for microfoundational research (Cohen et al., 2014).

Summary of microfoundations

To summarize the foregoing argument, when viewed from the perspective of individuals, the totality of a person´s recurrent situation-behavior processes are constitutive of personality; this condition is depicted by the heavy solid line shape in Figure 2. A sub-set of the same recurrent situation-behavior processes are constitutive of the habits of an individual, when specific patterns of situation-behavior are held relatively constant; this is depicted by the dashed

line shape in Figure 2. And when the situational stimuli and behavioral responses associated with a particular habit are held relatively constant for a group, they are constitutive of collective performance, as depicted by the dashed line shape in Figure 2. Moreover, if we consider the totality of goal directed collective performances for a group, they are constitutive of that group as an organization (Cohen et al., 2014).

The distinctions between personality, habit, collective performance and organization therefore derive from the degrees of relative consistency of core, cognitive-affective processing at different levels of integrated situation-behavior systems. Moreover, the complexity of the stable core subsystems of cognitive-affective processing at any level is inversely proportional to the complexity of the behavioral agent or agents; that is, core processing systems are more complex for personalities, less so for habits, less again for collective performances, and least complex at the level of organizations. Inversely, the behavioral agents or actors are least complex for personalities and habits (a single person), and more complex for collective performances and organizations (groups of persons).

Figure 4 summarizes these patterns. It distinguishes the configuration of situation-behavior for individuals and groups, in relation to either single or total systems of situation-behavior processes. For individuals, single situation-behavior processes are defined as habits, while the totality of a person´s situation-behavior processes represents his or her personality. For a group of persons, in contrast, single situation-behavior processes are defined as collective performance, while the integrated totality of such processes (an integrated system of collective performances) is defined as an organization. And as depicted in Figure 3, the greater the overlap of core elements between levels, the more embedded the relevant behaviors and the harder it is to change them.

The foregoing analysis has intuitive appeal. When focussing at the individual person level, cognitive-affective processes are more complex and stable. People tend to change and adapt their personality less frequently that their habits and collective performances. At the same time, when collective performances including routines attach to the core features of personality, people are more committed to that performance routine. And when changes in collective performances contradict features of personality, people tend to resist (Feldman et al., 2003; Kane et al., 2005). Yet when focussing at the group level, cognitive-affective processes are less complex and stable. That is, groups and organizations tend to change their constituent personalities and habits more frequently than their and collective performances. Indeed, the personalities within a group or organization come and go, while collective performances may remain relatively stable over time.

DISCUSSION

Individuals, groups and organizations co-evolve and interact within the social world. Situational features of that world stimulate intra-psychic cognitive-affective processes and resultant behaviors. The overall system is a behavioral ecology of groups of individuals who share situational stimuli, common patterns of intra-psychic processes and behavioral dispositions. Moreover, by virtue of their similarity, people behave in comparable ways, yet with varying degrees of collective coordination, deliberation and repetition. Thus conceived, the explanation of recurrent action patterns does not require the reduction of individual psychology to mechanistic biological determinants. Nor must any level of analysis occupy a privileged ontological status. Instead, individuals, groups and organizations are components of a complex

ecology of situation-behavior processes in which personal autonomy, inter-personal relatedness and organizational form co-exist with comparable significance (Mischel, 2004). The theory of the microfoundations of recurrent action patterns developed here reflects such an understanding of the behavioral world. It builds upon the CAPS theory of personality as a mediated cognitive-affective processing system, combining it with the perspective that groups and organizations are equally mediated systems of actors and associations (Latour, 2005; Scott & Davis, 2007). A number of theoretical contributions follow.

Organizations and routines

Most importantly, my theory contributes a new approach to the microfoundations of recurrent action patterns, synthesizing contemporary innovations in individual psychology and social organization. The theory achieves this by adopting the social-cognitive CAPS theory of personality, then building upon it to model habits and collective performances as recurrent situation-behavior patterns, mediated by variable cognitive-affective processes. Individual persons and social organizations are thus viewed as complementary systems, albeit organized differently. At one level of analysis—focusing on individual persons—situation-behavior systems underpin the CAPS model of personality and individual habits. While at the group level of analysis—focusing on recurrent action patterns among groups of persons—situation-behavior systems constitute collective performances and organizations themselves.

The resulting theory addresses a number of persistent dilemmas in the study of habits and collective performances. Firstly, it identifies the relationship between (a) individual-level cognition, affect and habitual behavior, and (b) group-level characteristics and behavior, but without needing to posit a separate process of aggregation between different levels of analysis. Rather, my theory posits that the distinction between individual and group levels of analysis is

explained by different degrees of intra-psychic complexity and stability: greater intra-psychic complexity and stability in relation to individual habits and personality, and less in relation to collective performance and organizations. Secondly, my theory reformulates our understanding of individuals within organizations. Both individuals and groups are integrated within complex ecologies of situation-behavior systems, thus providing a new perspective on perennial debates about the ontological status of personal and organizational agency. Thirdly, the theory incorporates affect, values and identities (as types of cognitive-affective processing units) into the microfoundations of collective performance, responding to the call for a more sophisticated, contextual appreciation of human psychology in microfoundational theories (Cohen, 2006; Winter, 2013). Future researchers should expand the analysis to identify the specific situational features and cognitive-affective units that interact in the origination of particular collective performances (see Becker, Knudsen, & March, 2006; Feldman et al., 2003).

Such research may illuminate additional features of routines as a type of collective performance. Some scholars argue that routines possess two major components or expressions as ostensive rules or organizational procedures, and as performative processes of enactment (Feldman et al., 2003). Adopting my theory, these proposed features of routines can be reconceived. Firstly, the specific patterns of situational stimulus embedded in organizational characteristics—as material artefacts, data stores, technological systems, formal procedures and cultural norms—such patterns of stimuli correspond to the ostensive or organizationally embedded features of routines. Secondly, the set of cognitive-affective processes which are elicited by such stimuli correspond to the performative or enacted features of routines. But unlike the ostensive-performative distinction, my theory does not entail an ontological distinction between embedded situational triggers as ostensive, and resulting behavior as performative.

Indeed, as a number of organizational scholars now argue, we should view situational cues and behavioral responses as integrated features of mediated organizing systems (Cohen et al., 2014; Davis & Marquis, 2005; Latour, 2005).

As another contribution, my theory suggests a re-conceptualization of individual and social agency. Some researchers conceive of organizational agency as the aggregation of individual agencies, while others argue that organizations possess attributes of agency in their own right (DiMaggio, 1997). As a potential synthesis of these contrasting perspectives, my theory suggests that the relationship between individual and organizational agencies can be re-conceived in terms of complementary cognitive-affective processing systems that mediate different patterns of individual and collective behavior. If the focus is on individual agency, the dominant category of analysis is the recurrent cognitive-affective processes associated with habitual behavior; whereas if the focus is on routines and organizational behavior, recurrent collective performances become the dominant category of analysis. That is, individual agency entails the full complement of intra-psychic processing; collective agency simply assumes that actors only share a minimum core of inter-psychic processing. In this way, persistent dilemmas regarding the relationship between different levels of agency might be resolved without violating the observed stability and distinctness of each. Notably, a number of prominent psychologists also endorse this general approach (Bandura, 2001; Cervone, 2005; Mischel, 2004).

Organizational learning and change

By modelling recurrent action in terms of mediated situation-behavior systems, my theory also contributes a new way to understand organizational learning and change. Put simply, organizational learning and change can be understood in terms of adaptive situation-behavior systems. In this regard, it is important to recall that the contextual variance of cognitive-affective

processing is fundamental to the CAPS theory of personality (Mischel et al., 1995). Fixed personality traits and types do not exist. Instead, different combinations of situational features and cognitive-affective processing drive variation and novelty. Such changes may result from altered situational features as exogenous drivers, or from new cognitive-affective processes as endogenous drivers (Cohen et al., 2014). Both scenarios are accommodated by my theory. Furthermore, such changes may be generated by singular or systemic alterations in the situational context—including altered encodings of collective identity, cultural values, regulatory schemes, emotional climate—or alternatively, change may be generated by changes in cognitive-affective processing among members of the organization, in terms of encodings of self and the world, affects, expectancies and beliefs, goals and values, or self-regulatory plans. Indeed, organizational change can be driven bottom up or top down, as individuals alter their cognitive-affective characteristics and behavior (e.g., Gutierrez, Howard-Grenville, & Scully, 2010; Howard-Grenville, 2005). Thus, the theory provides a more complex and fine grained picture of the micro-level dynamics of organizational change in terms of the re-generation of routines (Becker et al., 2005).

In similar fashion, my theory recasts the role of routines in organizational learning. Compared to most prior treatments of this topic, my theory provides a micro-level mechanism for the incorporation of new knowledge into routines and memory (Wilson, Goodman, & Cronin, 2007). As new knowledge is created or acquired, it is absorbed into the inherently adaptive cognitive-affective systems that mediate collective performances. New combinations of cognitive-affective processing units thus evolve and interact. Via such combinations, routines can adapt and novelties emerge, amplifying the natural variance in human cognitive-affective processes (Mischel et al., 1998). Repeated performance embeds the new knowledge into

27

recurrent action patterns. Hence much about organizational learning and innovation can be explained in terms of the dynamic combinatorics of cognitive-affective processing units (see Becker et al., 2006). Moreover, as in the case of organizational change, learning may result from altered situational triggers as exogenous forces, for example, new market conditions, or from cognitive-affective processing changes as endogenous forces, such as collective experience within collaborative teams (Argote, 1999). And the degree of overlap between core elements at each level will significantly determine the resilience of behaviors, and also the ease with which they can change and adapt through learning (see Volberda, Foss, & Lyles, 2010).

My theory further suggests an explanation for the imperfect replication of routines as a pre-condition of behavioral novelty, adaptive learning, innovation and dynamic capabilities (Becker et al., 2006). As Mischel and Shoda (1995) explain, the cognitive-affective processes that underpin personality are subject to constant variation in response to situational and psychological factors. Indeed, even the most stable cognitive-affective processing systems are prone to periodic variation. As a result, individual personalities are neither static nor fixed, but incrementally evolving and flexible. In the same way, group-level recurrent action patterns or collective performances are neither static nor fixed. Replication is inherently incomplete and deviation can be expected, reflecting the evolving nature of the underlying cognitive-affective processing system. Such incomplete replication is owing to the inherent complexity, conditionality and variability of these systems. Moreover, it is only when these microfoundations are exposed, that the full consequences of imperfect replication can be understood. Indeed, by uncovering the micro-level combinatorics of habits and collective performance, the theory developed here exposes the microfoundations of organizational variation, learning and adaptation. Future research should seek to investigate these processes in greater detail.

Behavioral theories

Microfoundational accounts have strong links to behavioral theories, given that both share a deep commitment to exposing the psychological characteristics of collective behavior. Consequently, my theory has implications for a range of behavioral topics. To begin with, the partial incommensurability between different levels of cognitive-affective processing suggests an explanation for the divergence between the normative and positive projects of modern microeconomics. Most normative theories assume a minimal core of cognitive-affective processing at the population level (typically deliberative reasoning unaffected by affect), while positive theories seek to incorporate a richer core at the individual and group levels (typically bounded cognitive processes influenced by affect) (March, 2014). My theory suggests a way to clarify and integrate these theoretical traditions. Each focuses on a different level of analysis of situation-behavior and related cognitive-affective processing: normative theories focus at the population level and assume minimal core cognitive-affective processes, while positive theories focus more on the individual and group levels and assume more complex core cognitive-affective processes (see Winter, 2014). Both then reify alternative core cognitive-affective processing subsystems. Moreover, the same distinction can be applied to theories of the firm. In particular, as called for by numerous scholars, my theory presents a richer vision of human psychology—cognitive, affective, situated and social—thereby suggesting a way to expand and deepen the behavioral theory of the firm (Cohen et al., 2014; Gavetti et al., 2007).

Once fully elaborated and tested, my theory may lead to significant practical benefits as well. For example, it is known that inflexible habits and routines can lead to competency traps that stifle exploratory learning and impede adaptation (March, 1991). Indeed, such recurrent action patterns are a major obstacle to effective organizational change and learning (Zbaracki &

Bergen, 2010). My theory suggests that it may be possible to identify the specific core cognitive-affective processes that perpetuate obstructive and maladaptive behaviors. Often these processes will be those that overlap with core personality characteristics, such as identity and values. But once understood, it may also be possible to amend such systems by targeted interventions which alter cognitive-affective processing. Duhigg (2012) provides strong evidence of such a process, for example, when the CEO of Alcoa aluminium, Paul O´Neill, triggered a significant change in fundamental routine behaviors by touching employees concerns for safety and shared well-being. Managing the micro-level triggers and mediators of core cognitive-affective processes could significantly improve organizational adaption and learning.

Conclusion

Given the fundamental role of recurrent action patterns in personal and group life, learning and change, it is important to understand their microfoundations. However, past research on these topics has been inconclusive, hampered by limiting theories of individual psychology. I present a fresh approach, adopting a novel social-cognitive perspective on personality and behavior. Building on this foundation, habits and collective performances are reconceived as configurations of situation-behavior systems, mediated by cognitive-affective processing units. Individual personality and habits, as well as collective performances and organizations, are thus reconceived as complementary expressions of the same underlying processes, reversing traditional assumptions of their ontological incommensurability.

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Table 1.

Types of Cognitive-Affective Units in the CAPS Theory of Personality

1. Encodings: categories (constructs) for the self, people, events, and situations (external and internal).
2. Expectancies and Beliefs: about the social world, about outcomes for behavior in particular situations, about self-efficacy.
3. Affects: feelings, emotions, and affective responses (including physiological reactions).
4. Goals and Values: desirable outcomes and affective states; aversive outcomes and affective states; goals, values, and life projects.
5. Competencies and Self-Regulatory Plans: potential behaviors and scripts that one can do, and plans and strategies for organizing action and for affecting outcomes and one's own behavior and internal states.

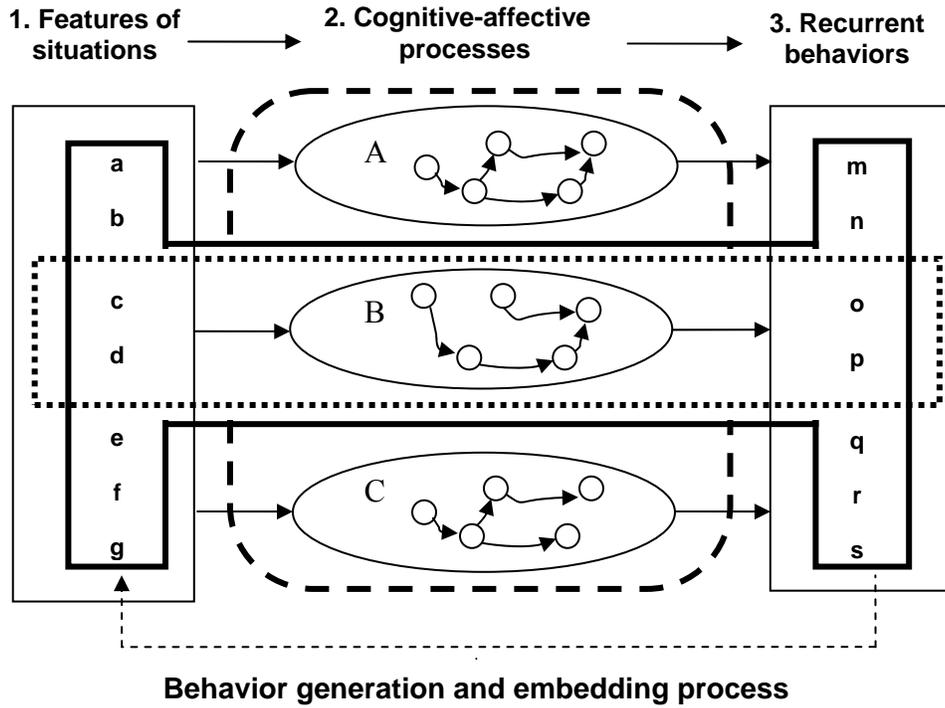(Source: Mischel et al., 1995: 253)

Figure 1.

Cognitive-Affective Personality System (CAPS)
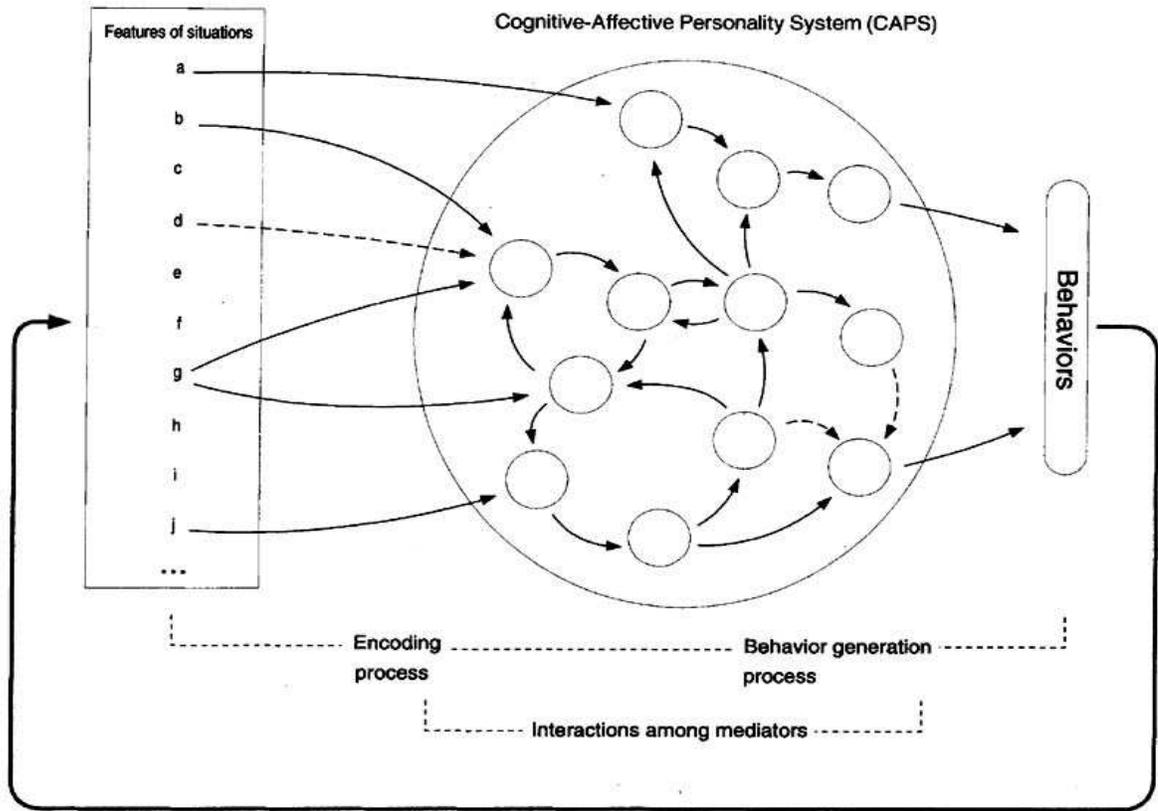

(Source: Mischel et al., 1995: 254)

Figure 2.

Model of personality, habit and collective performance

Behavior generation and embedding process

- Heavy line shape depicts personality system for person B, assuming full set of situations and behaviors.
- Dotted line shape depicts a habit for Person B, assuming similar situations (c, d) and behaviors (o, p).
- Dashed line shape depicts a collective performance for Persons A, B and C, assuming similar situations (c, d) and behaviors (o, p).

37

Figure 3.

Inter-connections between levels of recurrent action
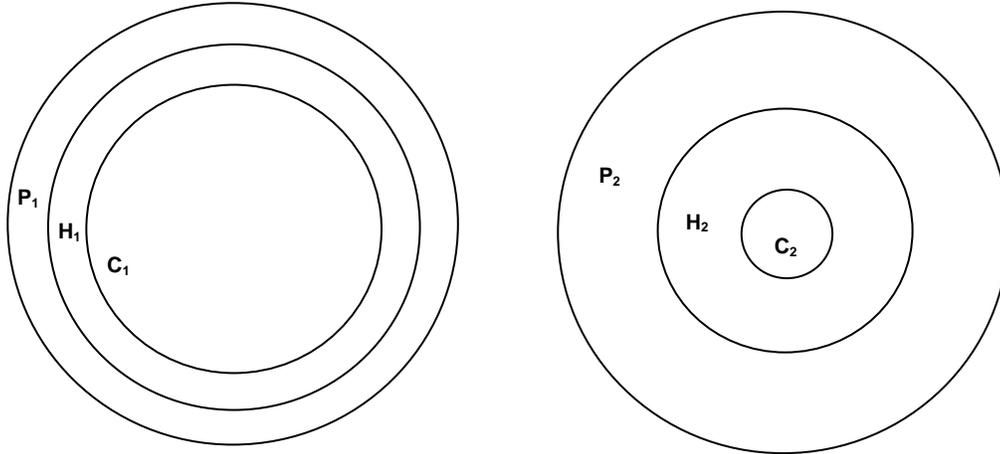
System S_1

High overlap between levels of
cognitive-affective processing

P_1 = Personality system
H_1 = Habit system
C_1 = Collective performance system

System S_2

Low overlap between levels of
cognitive-affective processing

P_2 = Personality system
H_2 = Habit system
C_2 = Collective performance system

Figure 4.

Configurations of situation-behavior processes

	Single person	Group of persons
Specific recurrent situation-behavior system	Habit	Collective performance
Totality of recurrent situation-behavior systems	Personality	Organization