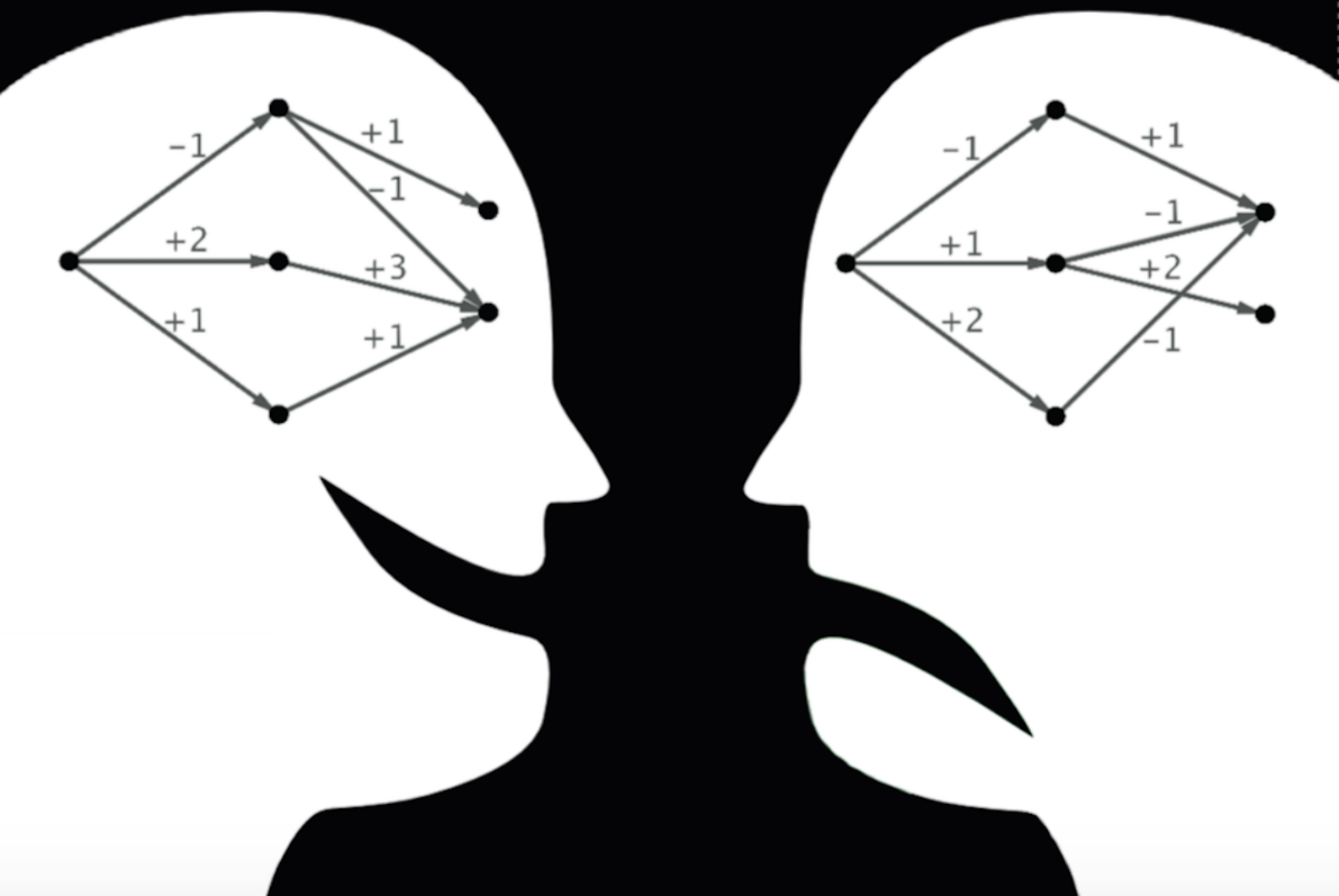
Goal priorities, cognition and conflict

Analyses of cognitive maps concerning organizational changes

Timo Septer



GOAL PRIORITIES, COGNITION AND CONFLICT

ANALYSES OF COGNITIVE MAPS CONCERNING ORGANIZATIONAL CHANGES

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I. INTRODUCTION

Organizational changes often evoke conflict; some members of the organization support the change, while others oppose it. This dissertation takes as point of departure that the degree to which organization members support or oppose organizational changes depends on the consequences they expect these changes to have, and on how relevant these consequences are to them. Based on this information, individuals make their personal estimates of the intended and unintended causal consequence of an organizational change on personal and organizational goals. We will use the term *cognition* for this causal reasoning concerning the consequences of a change, i.e. the effect the change will have on realizing certain goals. The *attitude* towards a change, i.e. the level of support or opposition towards the change, depends on this cognition, but also on the priorities they assign to each of the goals (their *goal priorities*). We argue that the attitude towards the change is determined by the overall effect the individual expects the change to have, the so-called *total effect*. This link between the total effect of the perceived consequences of a change and the attitude towards the change is validated in this dissertation.

We analyze individual employees' causal cognitions concerning the consequences of organizational changes. In doing so, we aim to get a better understanding of what determines these employees' attitudes toward the changes (i.e., the extent to which they agree with them) and of the causes and nature of potential interpersonal conflicts over the organizational changes. Whereas we focus on organizational changes, this approach could also be used to analyze cognitive differences, attitudes, and conflicts in other areas of interest, such as political or household decision making. In this dissertation we will disentangle three crucial different situations in which individuals have either similar or divergent cognitions. We will illustrate these situations by three examples. In the first example individuals differ in cognition, but they are not in *conflict*, i.e. they have the same attitude towards the change. The individuals in the second and third example are in conflict, since one supports the change while the other opposes it. However, in the second example the conflict is rooted in

different goal priorities, while in the third example the conflict is rooted in different causal cognitions.

Example I: Travel destination, no conflict, although cognitions differ
Anna and Bill are on a holiday. They both like hiking and visiting musea equally well. Although they like their current site Nomove, they consider traveling to another place, Travelon. Anna thinks that there are more hiking spots and only few less musea in Travelon, so she favors moving on. In other words, compared to the current situation (Nomove) she prefers to going to Travelon, i.e. to support the change. Bill thinks Travelon has fewer hiking paths than Nomove, but that Travelon has far more interesting musea, so he also favors traveling on. If they exchange arguments why they should or should not go to Travelon, Anna brings up that the most interesting musea in Travelon are closed due to rebuilding. Bill mentions that some hiking paths in Travelon are closed because of the birds' breeding season. Taken all this information together, they conclude that Travelon has less hiking paths and less interesting musea to visit than Nomove and they decide to stay. However, had they not exchanged information, they would both have preferred going to Travelon and would have made a suboptimal decision.

The example above is illustrated in Figure 1. Here the cognition is given as a simple weighted cognitive map (Axelrod, 1976; Eden, Ackerman & Cropper, 1992). The weights can take numbers between -3 to 3, indicating whether the change will make the specific goal weakly increase (1), increase (2) or strongly increase (3). A decrease is given by negative numbers, a zero indicates that there is no effect. Furthermore goal priorities are given with a number between 0 and 100. A priority of 100 is assigned to the most important goal(s). Lower priorities indicate how important that goal is relative to the most important goal (cf. how salience is measured by Bueno de Mesquita & Stokman, 1994; Stokman & Van Oosten, 1994; Septer, Stokman & Van der Iest, 2009).

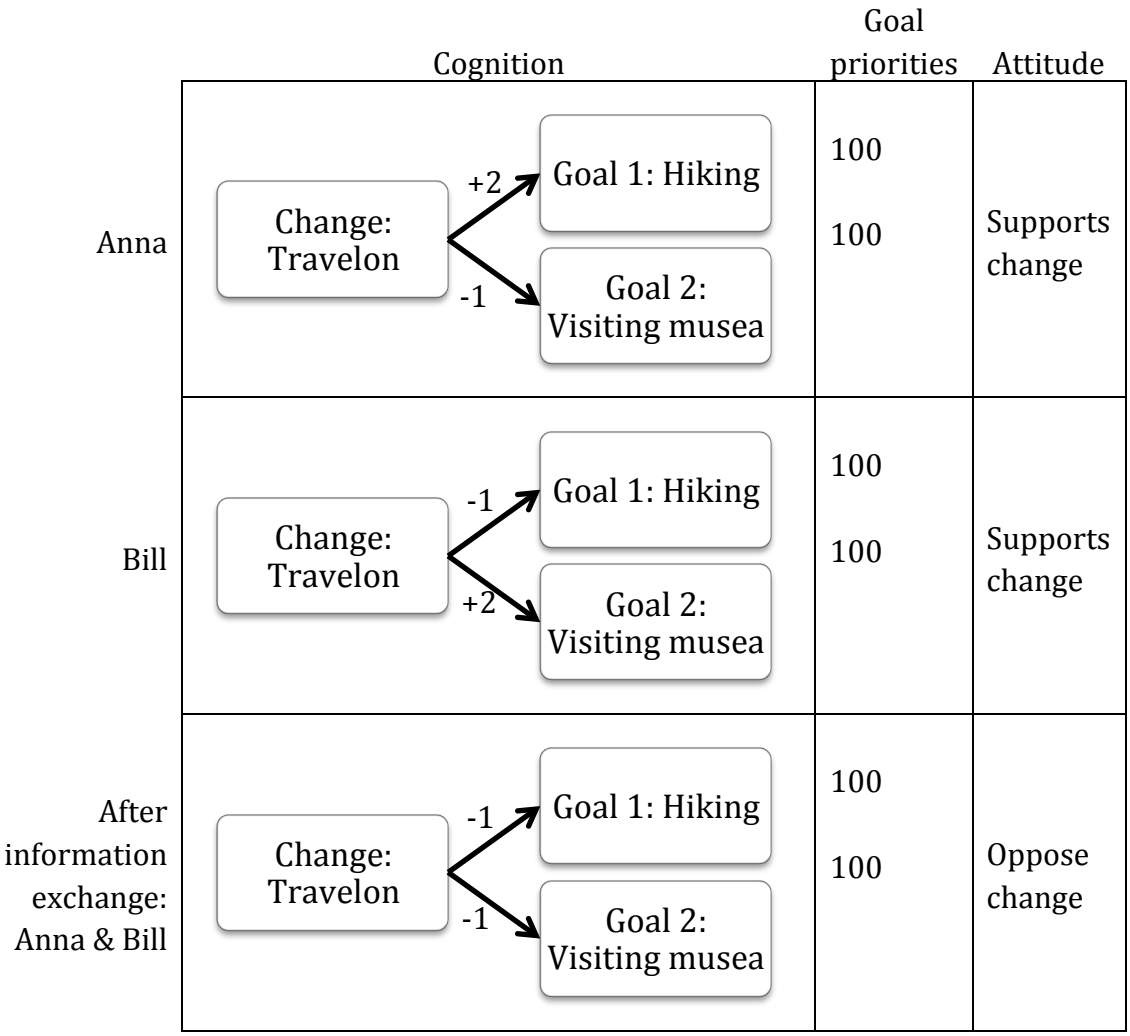

Figure 1: Cognition, goal priorities and attitudes given in example I.

Example II: Travel destination, conflict due to different goal priorities

Let's consider a slight variation of the previous example, in which Anna and Bill both think that Travelon has fewer hiking paths and only few more interesting musea to visit than their current location. However, for Anna hiking is more interesting than visiting musea, so she prefers to stay. Bill, on the contrary, strongly prefers visiting musea over hiking: he is in favor of moving to Travelon. In this situation they have the same cognition, but due to different priorities they are in conflict (see also Figure 2).

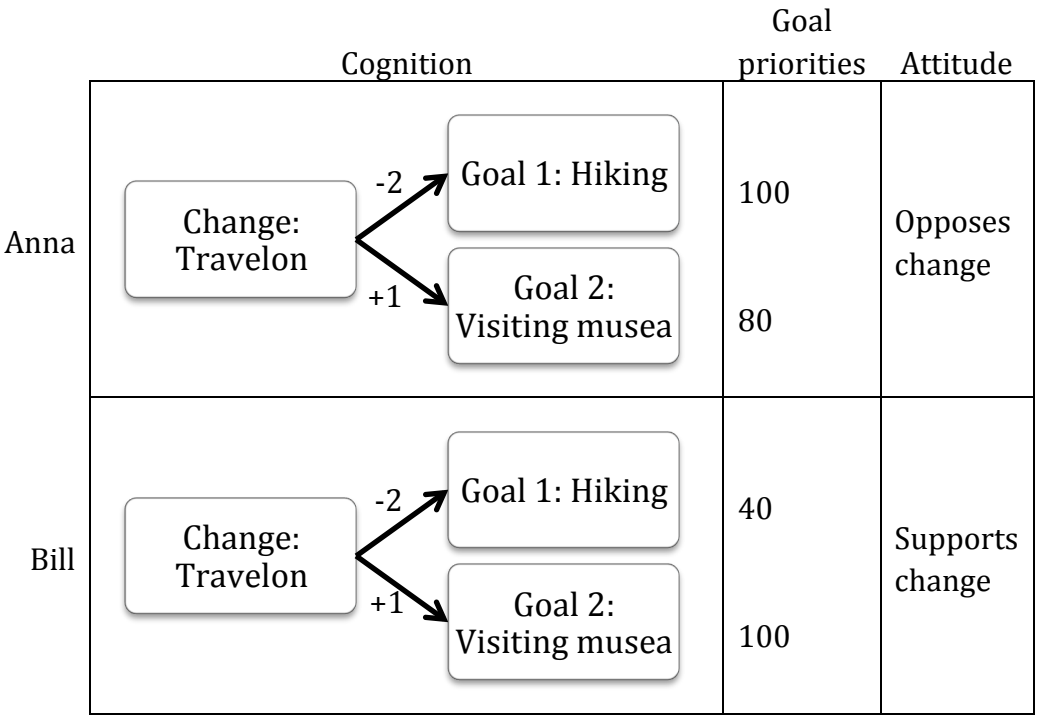

Figure 2: Cognition, goal priorities and attitudes given in example II.

Example III: More students per class: conflict due to cognitive differences

In a school two managers, mr. Learn and mr. Cash, want to reach a decision whether more students should be placed in each class. Mr. Cash believes that larger classes will reduce costs and will only slightly decrease educational quality. Since educational quality is only slightly more important than cost reduction, he supports the enlargement of classes (the positive consequences on cost reduction outweigh the small negative consequences on educational quality). Mr. Learn agrees with mr. Cash that educational quality is more important than cost reduction. He argues that with more students in a class, grades will become lower, the pass rate will decrease, and fewer freshman students will choose their school. Fixed costs for buildings and supporting personnel will hardly decrease, so the relative costs per students will increase. Mr. Learn therefore believes that more students per class in the end will not result in cost reduction. He believes that more students per class will result in no cost reduction while it does result in lower educational quality, so he opposes enlargement of classes (see Figure 3).

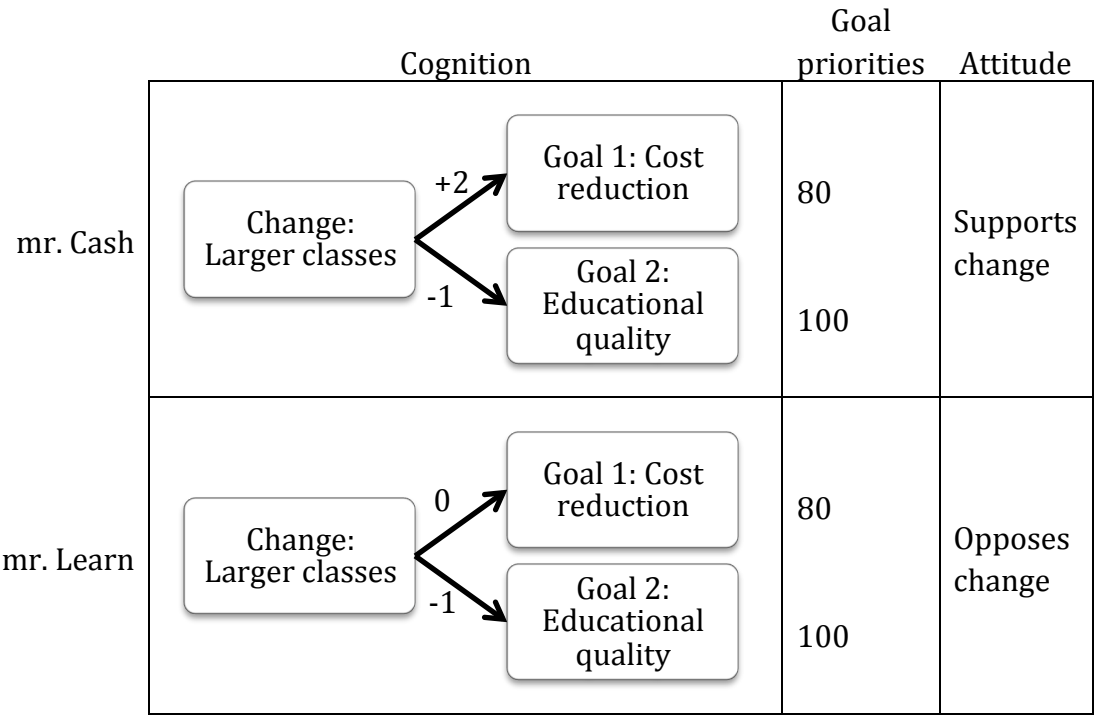

Figure 3: Cognition, goal priorities and attitudes given in example II.

In the examples above, the assessments of consequences (e.g., the number of hiking paths or cost reduction) resulting from a change (e.g., going to Travelon, placing more students per class) are part of an individual's cognition concerning the change. We will use the term *conflict* if some individuals oppose the change while others support it. We also distinguish the *level of conflict,* the variance in attitude between individuals. If some employees strongly oppose the change and some strongly support it the level of conflict is higher than in a situation in which individuals only slightly oppose (and/or support) the change. As we will elaborate upon, if individuals are in conflict and this conflict is mainly rooted in differences in causal reasoning concerning the effect of the change on the goals, we will refer to this as (mainly) being a *cognitive conflict* (e.g. example III). Contrary, if the conflict is mainly due to different goal priorities (e.g. example II), we will use the term *goal conflict.* Note that conflict refers to different preferences between individuals, not to conflict within individuals in situations in which they have to choose between alternatives they equally like (e.g. Tversky & Shafir, 1992).

We will now outline why it is relevant to further investigate the relation between cognition and conflict concerning organizational change, and why it is relevant to distinguish the three situations outlined in the previous examples.

COGNITIONS AND CONFLICT CONCERNING ORGANIZATIONAL CHANGE

Organizational changes are intended to accomplish some predefined goals (Cyert & March, 1963; Katz & Kahn, 1978; Balogun & Johnson, 2004). However, individual organization members differ in their cognitions concerning the consequences of change, i.e., the extent to which the change will contribute to reaching the goals (Weick, 1979; Sims & Gioia, 1986; Walsh, 1995). We show that these cognitions are the basis underlying employees' attitudes towards organizational changes (i.e., the extent to which they either support or oppose changes). Eliciting employee cognitions is crucially important for effective organizations, as research has shown alignment of cognition between management and employees to make the implementation of organizational change more successful (Reger et al., 1994; Labianca et al., 2000; Bartunek, 1984; Isabella, 1990). Conversely, divergence in causal cognitions has been linked to the failure of implementing organizational change (Markóczy, 2001).

Upon closer inspection, however, it becomes apparent that divergent cognitions do not necessarily result in divergent attitudes towards organizational change. Two individuals might perceive two different sets of positive consequences of a change. Based on these different reasons they might well both support the change (cf. Wittenbaum, Hollingshead, & Botero, 2004), indicating that divergent cognitions among employees do not necessarily result in different evaluations of the change (cf. Example I). Even more, divergent cognitions might have *positive* consequences for organizational change processes, as they can trigger fruitful discussions preventing groupthink (Janis, 1982), and hence result in qualitatively better organizational changes (De Dreu, 2006; Jehn & Mannix, 2001; Mooney, Holahan & Amason, 2007; Tjosvold, 2008). Thus (as is illustrated in Example I) cognitive conflict can be fruitful in the stage of decision-making, since it triggers the exchange of divergent views, resulting in higher quality decisions (Stasser & Titus, 1985; Brodbeck, Kerschreiter,

Mojzisch, & Schulz-Hardt, 2007). If however cognitions polarize, i.e. one group of employees adopts certain cognition while another group adopts a different (opposite) cognition, the organizational performance will decrease (Molleman, 2005; Pelled, 1996). Such polarized cognitions can result if there are groups of employees that mainly interact socially with other group members and hardly with other employees (Lau & Murnighan, 1998; 2005; Flache & Mäs, 2008). However, even if individuals socially interact and exchange information with all others and adopt the same cognition, they might still be in conflict. This is the case if individuals assign different priorities to the consequences of the change (cf. Example II).

Summarizing, it is theorized that a low level of cognitive conflict (or high level of shared cognition) is needed for successful implementation of organizational changes, and increases team performance. But it is also argued that cognitive conflict results in qualitatively better organizational changes. One explanation for these contradictory arguments and some contradictory findings is that different studies measure and conceptualize cognitions about organizational changes in different ways. In the literature, shared cognition is often measured at the organizational team level using questionnaires or interviews in which respondents indicate the level of cognitive conflict within the team (Mooney et al., 2007; Labianca et al., 2000). The level of conflict is then based on questions as 'To what extent are there differences of opinion in your team?' and 'How often do members of your team disagree about how things should be done?' (Jehn, 1994; Pelled et al., 1999).

Actual individual cognitions are then not measured, implying that actual cognitive differences cannot be directly investigated. We argue that this approach is missing in the literature. For instance, the three situations of our introductory examples are crucially different, but cannot be distinguished using the methods employed in the aforementioned literature. In example I individuals have divergent cognitions but are not in conflict (i.e. they support the change based on different cognitions). As the example showed, however, the proposed change might be suboptimal (or even detrimental) in spite of the common support it receives (cf. Stasser & Titus, 1985). Since no cognitive conflict is experienced at the organizational team or department level, the existing

measurement method mentioned above will not notice this sub-optimality. In example II individuals are in conflict even though they have similar cognitions, differing in priorities. Example III is a situation in which individuals are in conflict based on different cognitions. In both cases, the aforementioned measurement method would indicate the existence of cognitive conflict, but would fail to distinguish between the two cases. This distinction, however, is crucial to the solution of these conflicts. In particular, since the conflict of example II is based on difference in goal priorities, open-minded discussion is not likely to resolve it and reaching common support for implementation of the change purely based on persuasion is unlikely. In example III, conflict is based on different cognitions, which might be resolved through the exchange of information and arguments.

We argue that theories that try to explain successful implementation of change or organizational performance by the level of cognitive conflict is not fruitful if conflict is defined (and measured) as a general (average) level of different cognitions (both causal cognitions as well as different priorities). So where other researchers consider cognitive conflict as a variable at a macro level, we want to differentiate between different kinds of conflicts between employees, based on their individual cognitions. We propose a micro-macro theory (cf. Coleman, 1990) for explaining successful implementation of change or organizational performance. Crucial in our theory is that both the cognition and the goal priorities underlying the attitudes are taken into account. We distinguish four situations underlying common attitudes and three situations underlying different attitudes between individuals (we exclude the possibility that individuals having the same cognition and goal priorities differ in attitude). These situations are given in Table 1. If individuals having the same attitudes based on the same cognition (situations A and B) there is no conflict. The individuals will support the change and the implementation is likely to be successful. If the same attitudes result from different cognitions (situation D), there is a possibility that if they discuss, i.e. exchange their cognitions, their cognition will change in such a way that all of them change attitudes. Compare example I in which Anna and Bill would have made a suboptimal decision had they not exchanged information. Finally, individuals can have the same attitude

based on both different cognition and different goal priorities (situation F). In such cases consensus might be false. If they share their cognitions some individuals might make up their mind and change their attitudes where others do not (due to different goal rankings). In this situation the implementation of the change is supported initially, but for at least some individuals the actual effects on the goals will differ from their cognition. If the effects on high-prioritized goals are lower than expected, these individuals might start opposing the change.

Now we will outline the three different situations underlying different attitudes towards the change, so some will oppose it and others support it. If these differences are based on different cognitions, while their goal priorities are common (situation E), for some individuals the consequences of the change will not be as expected. In example III either mr. Learn is right that larger classes will not reduce costs or mr. Cost is right and costs will be reduced. Discussion, i.e. exchanging cognitions, is likely to make up the minds of some employees. If the ones opposing the change start supporting it, implementation of the change will be more successful. If the employees supporting the change make up their mind and start opposing the change, it would be better to waive implementation of the change. For instance if mr. Learn would be able to convince mr. Cash of his reasoning why larger classes will not result in cost reduction, both would oppose larger classes and the change will not be implemented.

However, different attitudes can also be the result of different goal priorities, while individuals have the same cognition (situation C). Then they are in goal conflict, which will not be resolved through discussion (since they already have the same cognition). Some individuals will oppose the change, making successful implementation less likely (Gioia and Sims, 1986). This situation was illustrated in example II where Bill wanted to go to Travelon, although he agreed with Anna that there were less hiking paths and only few more musea to visit. Their cognition was the same, but since visiting musea was far more important to Bill than hiking, while for Anna this was vice versa, they ended up with conflicting attitudes.

Finally different attitudes can result from both different cognitions and different attitudes (situation G). If through discussion the cognitions would be

aligned, the conflict might be resolved. However, since the goal priorities also differ, even when the cognitions are the same after discussion, the attitudes might still differ. In this situation it is not clear whether on the long run which employees will (still) support or oppose the change.

	Common goal priorities		**Different goal priorities**	
Common cognition	A. Same attitude *No conflict.*		B. Same attitude *No conflict.*	C. Different attitude *Goal conflict, unlikely to be resolved through discussion.*
Different cognition	D. Same attitude *Suboptimal decision possible, if there is no discussion.*	E. Different attitude *Cognitive conflict, likely to be resolved through discussion.*	F. Same attitude *Consensus might be false. Possibly suboptimal for some individuals.*	G. Different attitude *Conflict might be resolved through discussion.*

Table 1. Distinct situations underlying same attitudes of different attitudes.

In this dissertation we do not test whether implementation of changes are successful or whether organizational performance increases, based on different types of conflicting cognitions given in Table 1. We do make a first step that enables future testing of the theory sketched above. Measuring individual cognitions enables us to analyze whether or not divergent cognitions result in conflicting attitudes between employees and which cognitive differences contribute most to the (absence of) conflicting attitudes. We argue that cognitions about and attitudes towards organizational changes should be analyzed in conjunction, in order to explain phenomena as successful implementation of changes, or quality of collective decisions. Our research contributes to this by analyzing the link between cognitions and conflict, and by theoretically and empirically making the distinction between cognitive conflict (example III), goal conflict (example II) and cognitive differences that do not result in conflict (example I).

COGNITION FORMATION

In addition to the links between attitudes, goal priorities and cognition, we will investigate the formation of individual cognition. What causes one employee to expect the consequences of an organizational change to be more positive than another employee? A core theme in current explanations for such variations in

cognition concerning change is the relative contribution of *contextual* antecedents in explaining reactions to change (Oreg et al., 2011:466; see also Herold, Fedor, & Caldwell, 2007): group membership, processes of inter-individual influence, and the impact of individual social position (Lockett et al., 2014) are amongst the main factors assumed to account for cognitive variation. Cognition is shaped through social interaction (Abelson, 1964; Brass, Galakiewicz, Greve, & Tsai, 2004; Kerr & Tindale, 2004).

The strong focus on contextual antecedents has yielded important insights, but came at the expense of attention for an alternative explanation of how individual cognitions are shaped, namely *intra-individual* cognitive processes. The human mind has a strong tendency to reduce cognitive dissonance, ambiguity, and uncertainty (Heider, 1958; Festinger, 1957; Kruglanski & Webster, 1996; Lindenberg, 2006). Individuals try to prevent perceiving both large positive consequences of a change and large negative consequences. Two mechanisms play a role, changing part of ones cognition or adjusting goal priorities (Festinger, 1957). Suppose an individual supports the change but also perceives a large negative consequence of the change. Changing the cognition would mean that he easily adopts (or even actively seeks) arguments stating why the effect of the change on the specific goal is less negative. Another way to reduce cognitive dissonance would be to rollback the priority assigned to the specific goal. We will use to term *cognitive consonance* for striving to reduce the level of cognitive dissonance.

Cognitive consonance can be illustrated by a slight modification of example III. Had mr. Learn initially believed that larger classes would result in decreasing educational quality but also slightly decreasing costs, he would oppose the change although he also perceived benefits of it (slightly decreasing costs). Since he opposes the change, he would be more convenient to believe that there are no positive consequences of the change, or to play down these positive consequences. Therefore he is likely to adopt new argumentation reasoning that larger classes in the long run will not decrease costs. Another way of coping with the cognitive dissonance would have been to change goal priorities, making cost reduction relatively less important than educational quality. Such intra-

individual processes likely affect reactions to organizational change, but it is as yet unclear how they interact with contextual antecedents. In chapter IV we will analyze this interaction.

RESEARCH QUESTIONS

In this dissertation we contribute to the analysis of the relation between the cognitions concerning the consequences of organizational changes and the attitudes towards these changes. The main research questions are: *Which cognitive differences between employees concerning the consequences of organizational change result in conflicting attitudes towards that organizational change? What are the relative impacts of social context and intrapersonal consonance in explaining these differences?*

CAUSAL COGNITION AND GOAL PRIORITIES

Throughout this dissertation, we argue that in analyzing individuals' cognitions concerning the consequences of organizational changes, two aspects should be distinguished; i) the *size* and *direction* of the perceived causal effect from the organizational change on goals and ii) the *priorities* assigned by the individual to each of those goals. This distinction is relevant for three reasons. First, it gives rise to two fundamentally different types of conflict (Hammond et al., 1966; McGrath, 1984), namely *cognitive* conflict (example III) and *goal* conflict (example II). Different conflict types call for different resolution strategies (Deutsch, 1977, 1994). We will elaborate on both conflict types and the resolution strategies in the next subsection. Secondly, differentiating between conflicts based on different causal cognitions and conflicts based on different goal priorities might shed light on the aforementioned contradictory arguments concerning the effects of cognitive conflict on team performance (e.g. Cannon & Edmondson, 2001; De Dreu, 2006). Furthermore, including the possibility that individuals can have different goal priorities sheds new light on why individuals withhold information in discussion with the risk of making suboptimal decisions (Wittenbaum, Hollingshead, & Botero, 2004; Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007). If in example II Bill knows that for Anna hiking is more

important than visiting musea, he has an incentive not to mention that some hiking paths are closed in Travelon, the place he preferred. If he would tell Anna, he runs the risk that she will prefer to stay in Nomove. As we will elaborate on in Chapter V, sharing all information in an open-minded discussion, so also the information that is not in favor of your personal preference is not necessarily rational in a group in which (it is likely that) not everyone has the same goal priorities.

These first two reasons for distinguishing cognitions and goal priorities concern the comparison of cognitions between different individuals (inter-individual cognition, related to our first research question). The third reason, which we will outline below, concerns how different consequences of one organizational change perceived by one individual, are interrelated (intra-individual cognition, related to the second research question). Individuals have the tendency to prefer cognitive consistency over dissonance or ambivalence (Festinger, 1957; Heider, 1958; Kruglanski & Webster, 1996; Lindenberg, 2006). In our research this means that individuals will have the tendency to avoid ambiguous cognitions, i.e. they are likely to prevent perceiving large positive consequences as well as large negative consequences of an organizational change simultaneously. Consistency is reached through either changing the causal cognition, i.e. the perception of the effect an organizational change will have on a certain goal or the goal priorities, i.e. through making that goal less or more salient (Festinger, 1957). For instance in Example III mr. Cash supports larger classes because he believes it will result in quite some cost reduction and only small reduction of educational quality. However, supporting a means that will decrease educational quality, a goal he assigns higher priority to than to cost reduction, makes him feel uncomfortable. The level of discomfort resulting from perceiving both a positive and a negative consequence of the organizational change is called cognitive dissonance. This cognitive dissonance could be reduced if mr. Cash updates his causal cognition and decreases the effect larger classes will have on cost reduction, for instance after hearing the reasoning of mr. Learn that in the long run larger classes will not result in cost reduction since fewer students will sign in. Another way to reduce cognitive dissonance of mr. Cash would be to update the priority he assigns to cost reduction relative to

educational quality. If at the moment the school debts are low, he could argue that cost reduction has far lower priority than educational quality. By both mechanisms (decreasing the expected effect on cost reduction or assigning lower priority to cost reduction) will result in a lower level of cognitive dissonance.

COGNITIVE CONFLICT AND GOAL CONFLICT

The distinction between cognitive conflict and goal conflict can be understood as follows. A cognitive conflict occurs if individuals having equal goal priorities differ in the extent to which they believe an organizational change will contribute to reaching those goals (example II). A goal conflict occurs if individuals agree on how much an organizational change will contribute to reaching each goal, but differ in the priorities they assign to each of those goals (example III). Of course conflicts can be rooted in both cognitive differences and different goal priorities. If however the conflict would be resolved if all individuals would adopt the same (average) cognition, we will label it as being (mainly) a cognitive conflict. On the other hand, if the goal priorities differ in such a way that even if the individuals would end up with the same (average) cognition after an exchange of arguments, their attitudes would still differ, we will label it as being (mainly) a goal conflict.

Both types of conflict require different resolution strategies (Deutsch, 1977, 1994). Research has shown that rational persuasion, i.e. trying to change the attitude of others by giving arguments or new information, appears to be best suited for the resolution of cognitive conflicts and less so for goal conflicts (Alexander, 1979; Mohammed & Ringseis, 2001; Tjosvold, 1985, 2008). Goal conflicts can be resolved through negotiation over several policy changes, settling for the preferred policy of some individuals on one issue in exchange for the preferred policy of others on another issue (Udehn, 1996; Arregui et al, 2006; Dijkstra, van Assen & Stokman, 2008; Stokman et al, 2013). For instance in examples I and II at the beginning of the chapter Anna and Bill had to decide whether or not they should travel on to Travelon. If they both prioritize hiking and visiting musea equally, but Anna wants to move to Travelon while Bill wants to stay in Nomove, this conflict must be due to cognitive differences. Then

rational persuasion, i.e. exchanging information over the amount of hiking paths and musea in Travelon compared to Nomove, is likely to resolve the conflict. If however (as in Example II) they are in conflict while they have the same cognition, but the conflict is due to the fact that for Anna hiking is more interesting than visiting musea, while Bill strongly prefers visiting musea over hiking, rational persuasion will not resolve the conflict. In such a case negotiation is better suited, for instance resulting in spending a few more days in Nomove and then go to Travelon for a few days.

Due to insufficient awareness of the distinction between interpersonal differences in perceived consequences of organizational changes and differences in goal priorities, cognitive conflicts and goal conflicts are often confounded in the literature (Hammond et al., 1966; McGrath, 1984). Some of the previously mentioned inconsistent arguments in the literature are due to conglomeration of cognitive conflicts and goal conflicts, or by neglecting one of the two conflict types. For instance the argument that cognitive conflict results in open-minded discussion, which generates organizational changes of higher quality, resulting in higher team performance, only holds if the team member have the same goal priorities. Otherwise they might still have different preferences whether or not to implement a change (as we will show in Chapter V).

KEY CONTRIBUTIONS OF THIS DISSERTATION

This dissertation makes five key contributions to the literature on organization members' cognitions about and attitudes towards organizational changes. First, we theoretically elaborate and empirically validate the link between cognitions about and attitudes towards an organizational change (contribution A). Second, in mapping cognitions we account for organization members' perceived direction and strength of causal effects of changes on goals, and for their goal priorities, allowing us to distinguish different types of conflict, such as the types of conflict in Example II and III (contribution B). Third, by computing the expected attitudes of employees after a change in one step in their cognitive reasoning, we propose and demonstrate a method that allows the identification of the cognitive differences that contribute most to conflict in a group of

employees (contribution C). Fourth, having developed a novel and accurate measure for cognition, we analyze the extent to which cognition is affected by both social (and organizational) context and intrapersonal tendencies to reduce cognitive dissonance or ambivalence (contribution D). Fifth, as cognitions are based on information organization members have about an organizational change (cf. Example I), we analyze the implications that different degrees of information and information exchange have on interpersonal differences in attitudes towards the change (contribution E).

An overview of these contributions and how they are related to each other and to the dissertation chapters is given in Figure 4. An overview with an explanation of the key concepts that are introduced above, is given in Table 2.

Related to the first two contributions, in chapter II we will present an empirical method for analyzing whether interpersonally conflicting attitudes towards an organizational change are mainly due to cognitive differences concerning the effects of the change on goals, or to different goal priorities. Similarly related to the first and second contribution, Chapter III focuses on the causal reasoning of employees, which consist of several steps. For instance, 'a regionalization measure will result in less information exchange between regions (step 1), in turn resulting in lower quality of patient care (step 2).' We analyze which steps in these causal reasonings contribute most to conflicting attitudes (contribution C). The question of how individual cognitions are explained, related to our fourth contribution, is taken up in chapter IV. Are cognitions shaped by context, such as a member's department or hierarchical level, or by intrapersonal processes of reducing cognitive dissonance? Finally, related to our fifth contribution, Chapter V experimentally investigates attitudes towards two hypothetical organizational changes. Our main experimental manipulation is the amount and nature of the information individuals have concerning the changes. We have chosen the pieces of information in such a way that individuals differed in the priorities they assigned to the information, which enabled us to form couples that would be in a cognitive conflict, as well as couples that would be in a goal conflict. We theoretically distinguish under which conditions revealing all information to all individuals would decreases conflict and when it would increase conflict. This allows us to empirically assess the

incidence of several important cases, such as the proportion of times that revealing all information would actually increase interpersonal conflict.

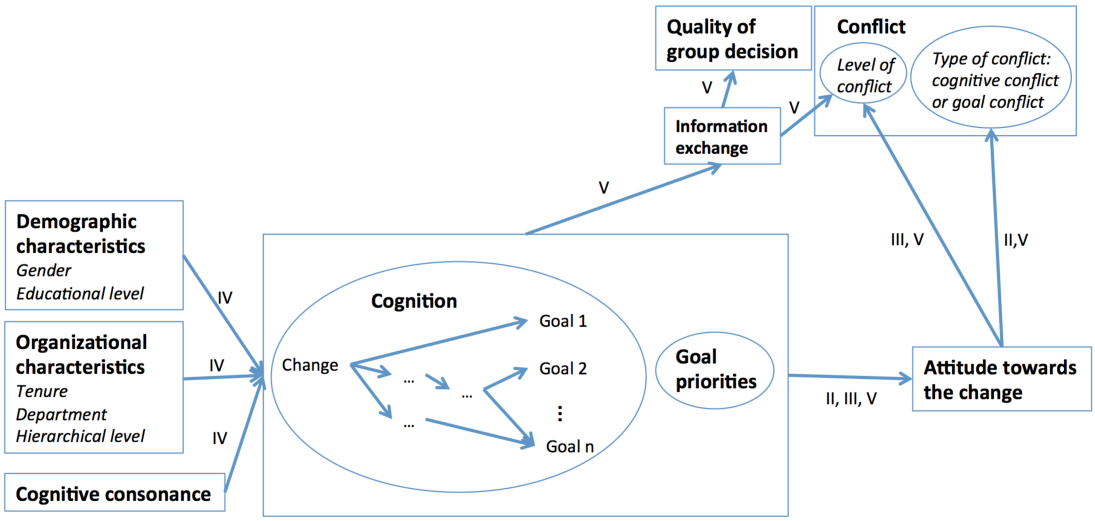

Figure 4: Conceptual model with overview indicating the chapters in which model parts are analyzed; Chapter numbers in Roman numerals.

Cognition	Individual's causal reasoning of the consequences of an organizational change on goals (via subgoals). The causal effects have weights (from weakly (1) to strongly (3)) and directions, e.g. if a means will strongly decrease achievement of a certain goal, this is coded as -3.
Goal priorities	Individual's ranking of the (relative) importance of reaching each of the goals. The most important goal(s) get a priority of 100, the other goal priorities are numbers between 0 and 100 representing the relative importance of these goals compared to the most important goal(s).
Change impact perception	A measure for an individual's satisfaction of the effect from an organizational change on a certain goal, computed as the causal effect multiplied by the goal priority.
Total effect	The combined effect of all individually perceived effects on the goals, weighted with goal priorities. This measure indicates whether, for a certain individual, overall the positive effects of the organizational change on the goals outweigh the negative effects. It is a summation of the change impact perceptions on the different goals.
Attitude towards the change	The extent to which an individual supports or opposes the implementation of the organizational change. This attitude is measured independently from the cognition and the goal priorities. It is based on the cognitive resistance scale of Oreg (2006). Total effect is used as a proxy for attitude.

Level of conflict	The extent to which the attitudes towards the change varies between individuals.
Cognitive conflict	If variance in attitudes between individuals is mainly due to cognitive differences (rather than to different goal priorities), we will refer to this conflict as a cognitive conflict. In practice this means that if all individuals adopting the same (average) cognition, while keeping their own goal priorities, would reduce the level of conflict, we will refer to this conflict as being (mainly) a cognitive conflict.
Goal conflict	If variance in attitudes between individuals is mainly due to different goal priorities (rather than to different cognitions), we will refer to this conflict as a goal conflict. In practice this means that if all individuals adopting the same (average) cognition, while keeping their own goal priorities, would not reduce the level of conflict, we will refer to this conflict as being (mainly) a goal conflict.
Cognitive consonance	Cognitive consonance (reduction of cognitive dissonance) refers to individuals' tendency to reduce ambiguous cognitions, i.e. to prevent perceiving both large positive consequences of a change and large negative consequences. Two mechanisms play a role in order to make cognitions consonant, namely changing ones causal cognition or changing the goal priorities. Suppose an individual supports the change because he expects positive consequences of the change, but also perceives a large negative consequence on the goal processing speed. These contradictory beliefs are referred to as being cognitive dissonant, and individuals strive to reduce this dissonance. Reducing cognitive dissonance by changing ones causal cognition would mean that one easily adopts (or even actively seeks) arguments stating why the effect of the change on the specific goal (processing speed) is less negative. Another way to reduce cognitive dissonance would be to rollback the priority assigned to the specific goal. In this example the individual would then update his goal priorities and will assign a lower priority to processing speed compared to other goals, such as product quality (for instance by assigning much value to clients stating that the quality of the product was worth waiting for). As a measure for cognitive consonance we have used the correlation between the change impact perceptions within individuals.

Table 2. Explanations and conceptualizations of key concepts of this dissertation.

APPROACH

Cognitive maps

We will now explicate the empirical approach used in this dissertation. Our aim was to collect data capturing cognitions of individual employees concerning the

effects of organizational changes on personal and organizational goals, such that i) we can predict attitudes towards the change from the cognitions (contribution A) and ii) we can compare cognitions across employees and analyze which cognitive differences result in different attitudes (contribution B). Attitudes towards the change were measured using Oreg's 6-item scale for cognitive resistance towards change (Oreg, 2006).

For our aim of capturing the causal cognition of employees concerning the consequences of organizational change on important (organizational and personal) goals, cognitive maps (Axelrod, 1976; Huff, 1990) are well suited. Cognitive maps are models capturing the personal theories or reasoning of actors about their environment. The maps consist of nodes and links. The nodes represent concepts, such as satisfaction, productivity or safety. The links represent the relationships between those concepts, according to the actor, such as proximity, association and equivalence (Carley, 1993; Hoede & Willems, 1989; Popping, 2003). In this dissertation we will analyze cognitive maps with causal relationships (Axelrod, 1976; Huff, 1990), which are sometimes referred to as *cause maps* (e.g. Eden et al, 1992).

Our maps have a means/ends structure (Montibeller & Belton, 2006). There are one or several means (in our case, organizational changes), which are nodes with only outgoing links to other nodes in the map. These means are variables that can be changed directly, such as starting to produce a new product or changing the duration of weekly meetings. Ends are nodes with only incoming links, and represent the goals that were intended to be reached through implementation of the change as well as other (unintended) goals (i.e., unintended effects or consequences).

An example of such a map is given in figure 5, representing the cognition of an actual employee in one of our data sets, concerning the merger of two previously separate food and commodities inspection agencies into one inspection agency. In this map the merger is the means and the ends (or goals) are productivity, job satisfaction and quality of output. The other nodes represent sub-goals, such as responsibility of employees and collaboration between employees. The weights assigned to the arcs indicate whether, according to the employee who ‘owns’ this map, the causal effect is positive or negative and how large the effect is. For

instance the new IT systems will 'decrease' the level of job satisfaction (weight -2) and will 'slightly decrease' the quality of output (weight -1), while for instance increasing responsibility would 'slightly increase' the level of productivity (weight +1). According to this map the merger will positively contribute to integration of IT-systems and will result in new tasks. The merger will have a negative effect on other goals and sub-goals, such as the responsibility of employees and job satisfaction. Thus, this map captures the individual cognition of an employee who expects the merger to have negative effects on all of the end goals.

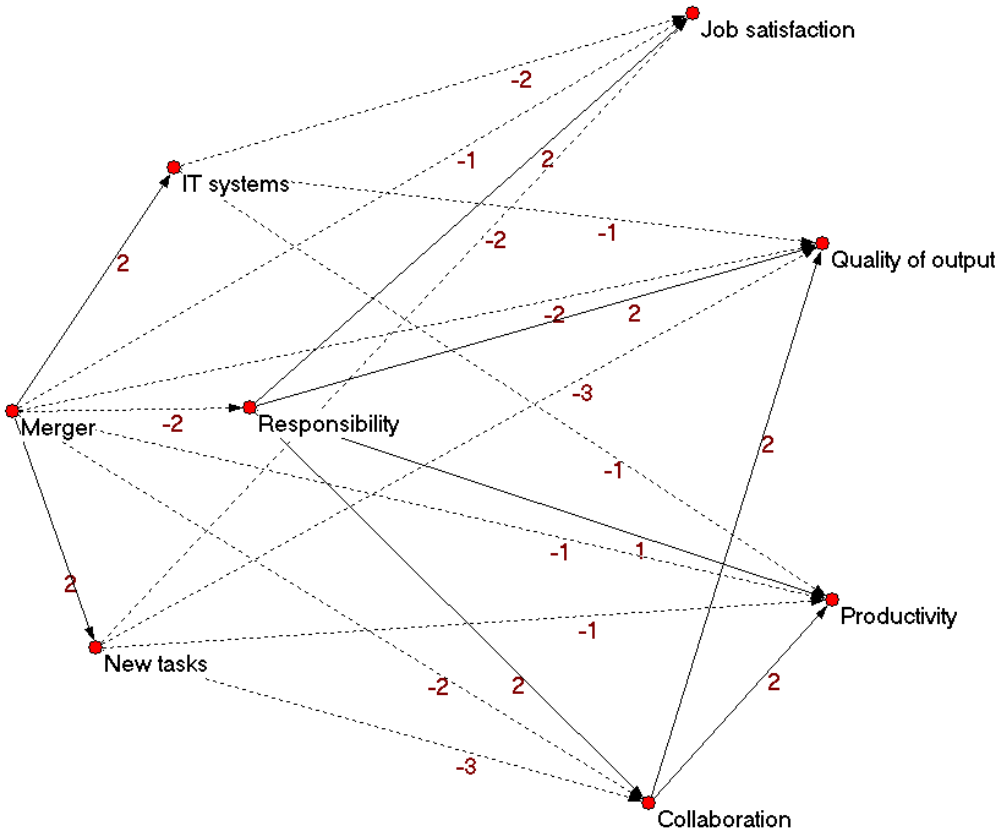

Figure 5: Weighted cognitive map of an employee concerning the consequences of a merger. Dotted arcs represent links with negative weights, solid arcs indicate positive weights.

Measuring cognitive maps to investigate conflict

Since conflicting cognitions appear if different individuals perceive different effects of the means on goals, it seems natural to use causal cognitive maps to

analyze to what extent conflicting attitudes over a means, are rooted in cognitive differences. In previous research cognitive maps are used to capture the causal reasoning of individuals, but goal priorities are not included. We expand the maps with goal priorities, making it possible to predict which individuals are in goal conflict.

Comparing cause maps across individuals

In order to measure the level of cognitive conflict we need a method to compare maps between individuals. We will give a short overview of some existing measures to compare individuals' cognitive maps and discuss why they are not suited for our purpose to derive the type of conflict. Then we introduce our own method.

Eden et al (1992) use measures to compare the complexity of the maps between individuals, and measures to compare the structure of the maps. They focus on the number of links and nodes in the maps and whether there are clusters of nodes that are strongly interconnected. Such comparisons allow for instance to investigate the relationship between the level of complexity of an individuals' map and the quality or quantity of the interventions these individuals propose. But in this approach there is no link with attitudes towards the change. An employee with a complex cognitive map and an employee with a simpler cognitive map might have similar attitudes towards a change. Therefore, even though comparing the complexity of maps does give some information concerning whether maps between individuals are similar, the maps cannot be related to the level of conflict over whether or not the change should be implemented.

Other scholars use a distance ratio to compare maps (Langfield-Smith & Wirth, 1992; Markóczy & Goldberg, 1995). The more nodes or links that are different in maps of different individuals, the larger this distance is. This measure is also not suited for analyzing conflict, since some differences in cognition do not result in conflict. Different reasoning can result in supporting a certain means. Hence, we are interested in those cognitive differences that lead to conflict. To go from cognitions about a change to attitudes towards it in an

interpersonally comparable way, we need a method to 'compress' cognitive maps including goal priorities in terms of some measure of 'overall perceived consequences'. In chapters II, III and V we present such a measure to predict the attitudes towards a means from the cognitive maps of individuals (contribution A). This measure for the perceived overall effect, based on the individual cognitive maps and their goal priorities, correlates highly with their attitude towards the change. These results allow us to investigate which cognitive differences result in conflicting attitudes, i.e. in answering our first research question.

Collecting cognitive map data

There is no general approach in the literature to the way data about maps are collected. Maps are derived from text analysis, interviews and/or questionnaires. Text analysis can be used on minutes of meetings in which some issue is discussed or on newspaper articles (Axelrod, 1976; Anthony et al, 1994). For analyzing historic events or the reasoning of (famous) people who are not willing or able to participate in interviews or filling out questionnaires, such text analysis is the only option. We have collected data concerning current organizational changes, for which we could use interviews and questionnaires. In preparation of the interviews we read policy documents in order to gain insight in some arguments underlying the implementation of the proposed changes.

Since our aim is to compare cognitive maps across different organization members, we wanted to elicit *nomothetic* maps rather than *idiographic* maps. In idiographic maps individuals are free to add as many concepts (nodes) and relations (links) as they want, and are allowed to express everything in their own words (Cosette & Audet, 1992; Daniels et al, 2002). In the resulting maps it is not clear whether different words refer to the same concept and more general whether reasoning that seems different on the surface, actually is different. Furthermore, if a certain map lacks links that are present in others, it could either be that the first individual actually believes that these concepts are unrelated, or that s/he simply forgot to mention (or draw) the relation. From idiographic maps, these two cases cannot be taken apart. Therefore, in line with

for instance Hodgkinson (1997, 2002), we argue that idiographic maps are interpersonally incomparable.

To circumvent this problem, we have collected nomothetic maps. These are maps for which we first have selected a pool of potentially relevant concepts, based on document analysis and some initial interviews. Then we have asked respondents how, in their perception, these concepts are (causally) linked (e.g. Hodgkinson et al, 1999; Markóczy & Goldberg, 1995). An advantage of nomothetic maps is that it forces respondents to explicitly report their belief that a causal link does not exist. Another advantage of the use of nomothetic maps is that after the relevant concepts and links have been selected, the maps can be collected in questionnaires, making it possible to collect data of many more individuals within a limited time frame, compared to an approach that relies solely on face-to-face interviews. The selection of the appropriate relevant concepts and links to be included in the nomothetic maps is crucial. If relevant concepts are overlooked or if concepts are described too abstractly, a reliable interpretation both of these concepts by the respondents and of the resulting maps by the researcher are jeopardized (Nicolini, 1999; Daniels, Johnson & De Chernatony, 2002). Therefore, we have collected data in three steps. Based on seven to ten in-depth interviews we have made a preliminary questionnaire (step 1), which we have tested in a pilot group of respondents (different from those participating in the interviews or in the final questionnaire; step 2). Then, the final questionnaires were sent to a random sample of employees in each organization (step 3).

In the final questionnaire we asked about the causal reasoning with questions of the form 'if [concept 1] will increase, then [concept 2] will …', using a seven-point Likert scale from largely decrease (-3) to largely increase (+3). Goal priorities are measured on a level from 0 (not important at all) to 100 (the most important goal to achieve). Respondents were asked to assign 100 to the goal(s) that are most important to them and then assign numbers between 0 and 100 to the other goals, indicating the relative importance of that goal (cf. how 'salience' is measured in Bueno de Mesquita & Stokman, 1994; Stokman & Van Oosten, 1994; Septer, Stokman & Van der Iest, 2009).

Data were collected in three Dutch semi-public organizations: a food and commodities inspection agency (Chapter III), a forensic psychiatric center, and a youth welfare work institution (both used in Chapters II end IV). In the food and commodities inspection agency the organizational change under consideration was a *merger* between two previously separate agencies. The two organizational changes we investigated in the youth welfare work institution were a *regionalization* and a *new care program*. In the forensic psychiatric center we likewise investigated two organizational changes, viz. the *privatization* of the (formerly public) organization and the introduction of a *new care program*. The data and the data collection are described in more details in the respective chapters.

OVERVIEW OF THE FOUR STUDIES

Chapter II

Our first research question was which cognitive differences between employees concerning the consequences of organizational change result in conflicting attitudes towards that organizational change? In chapter II the distinction between differences in causal cognition and differences in goal priorities is central in explaining conflicting attitudes: how to derive whether conflicting attitudes between employees are mainly due to causal cognitive differences (i.e. a cognitive conflict) or mainly due to different goal priorities (i.e. a goal conflict)?

We compare the cognitions of employees with the cognition of management, who initiated the change. In conflicts between management and employees over proposed organizational changes, we distinguish *goal conflicts* and *cognitive conflicts*. The former occur when management and employees have different priorities concerning ultimate goals, the latter if they have different causal beliefs about how effective the proposed organizational change is in reaching those goals. We use a cognitive mapping approach to measure causal cognitions concerning the effects that specific organizational changes have on goals. Furthermore we have independently collected data about attitudes towards the change. We derive a measure from the maps that explains the attitude towards the organizational change to a large extent (contribution A). Demonstrating the

usefulness of our approach for conflict resolution, we find, in data concerning changes in two Dutch organizations, that the attitude of employees towards these organizational changes would become significantly more positive if they would adopt the causal cognition of management, compared to their adoption of the goal priorities of management. In other words, in our data the employees opposing the change were mainly in a cognitive conflict with management rather than in a goal conflict (contribution B, distinguishing different types of conflict). This type of conflict might be resolved through rational persuasion, i.e. management and employees exchange arguments over the effects the organizational change will have on the goals. If consequently their cognition becomes more similar, their attitudes towards the change will become more similar (i.e. the level of conflict decreases or the conflict is even resolved).

Chapter III

In Example III the reasoning of mr. Learn why more students in a class will also make costs increase (grades becoming lower - pass rate decreasing - fewer students enrolling - relative costs per students increasing) consists or several steps. In this chapter the question is which step in the causal reasoning of employees contributes most to the level of conflict. Whereas chapter II focused on disentangling whether conflict was due to different goal priorities or to different causal cognition, in this chapter the analysis of which causal reasonings should be discussed in order to decrease the variation in attitudes towards the change is central (answering our first research question).

The reasoning underlying the attitude of individuals towards the implementation of a means can be captured in causal cognitive maps about the effects of the means on relevant subgoals and on endgoals. For cognitive maps with weighted directed signed links we propose quantitative measures for the weight of the paths between means and goals and a measure for the total result of the means on all goals. In data about the cognitive maps of 94 employees about their perceived consequences of a merger, the latter measure correlates strongly with their independently measured attitude towards the merger (contribution A). Finally we propose a method to detect about which links in the

map the cognitive differences between individuals contribute most to their differences in attitudes towards the means, in the sense that agreement on these links would decrease the variance in the attitudes most (contribution C).

Chapter IV

Employees' cognitive reactions to organizational change are often divergent; some expect positive consequences of the change, while others expect negative consequences. Since alignment of causal cognition across organizational members can be a critical factor for successful implementation of change, it is important to understand how employees' cognitions are shaped. In chapter IV the second research question is central: are cognitive differences explained by social context or by intrapersonal cognitive consonance?

In the literature two different processes of cognition formation are described, one at the inter-individual level and one at the intra-individual level. Inter-individual explanations of cognition formation focus on social processes, like social influence, predicting that group membership and social position explain cognition. Also selection of similar individuals into organizational groups and positions would yield an association between cognition and position. This means that employees with the same (demographic, educational, or organizational) characteristics are likely to have the same cognitions. A key intra-individual process of cognition formation is the tendency to avoid ambivalence; individuals strive for cognitive consistency. Thus if an employee expects a large positive effect on some important goal, this employee will also expect positive or at most only small negative effects on other goals (or will assign low importance to negatively affected goals).

In Chapter IV we hypothesize that both inter-individual and intra-individual processes exist, and investigate their relative strength using cause map data and goal priorities concerning two organizational changes in a Dutch psychiatric center and a youth welfare work institution. Using multivariate multilevel models in which the change impact perceptions of a change on several goals are nested within individuals, we can analyze the correlation structure of intra-individual cognition, controlling for group membership and social position. We

found that more similarity in cognitions existed between employees within the same hierarchical level or within the same department. Furthermore the expected effect of a change on one goal and the effect on another goal, were correlated within individuals, i.e. their cognitions were consonant. In answering our second research question these findings imply that both inter-individual and intra-individual processes shape employees' cognition (contribution D).

Chapter V

In this chapter the focus is on how attitudes of employees change if they get more information concerning organizational changes, i.e. if their cognition concerning the consequences of a reorganization changes. The main question is under which conditions it is rational for an individual to exchange all information with others with whom a decision has to be made and when it is rational to exchange only information that is consistent with ones own attitude (contribution E). Social psychological experiments in which individuals have to reach a common decision (e.g. pick a holiday destination or a job applicant) show that participants are inclined to emphasize *shared* information that is *consistent* with their initial preference. As a consequence, they are often shown to arrive at suboptimal outcomes (Stasser & Titus, 1987; Schultz-Hardt et al, 2006), as would be the case if in example I Anna and Bill would not exchange all information.

All these experiments have in common that all participants prefer the same alternative in the full information case. In other words, a basic assumption in this line of research so far is that group members all have the same priorities over the pieces of information, resulting in the fact that if everyone exchanges all the information they have, all individuals would agree on what is the best decision, based on this complete information. We argue that this is a very restrictive assumption when it comes to understanding real-life group decisions. As example II shows, individuals can be in conflict based on the same cognition (i.e. information set) if their priorities differ, i.e. they are in goal conflict. Therefore it is possible that individuals all supporting a certain change prior to information exchange, end up with conflicting attitudes to the change if they exchange all information, particularly the information that is not in favor of the change they initially supported. On the other hand, not exchanging all

information can also result in reaching a suboptimal decision, i.e. if after exchanging information they would all (agree to) oppose the change.

We demonstrate that if individuals have the same goal priorities, sharing all information always results in the optimal decision. However, if goal ranking is not aligned, just sharing preference consistent information might be in ones own interest, since sharing all information could result in a conflict under this condition. We investigated the relative frequencies of the two situations in a data set where 83 participants had to choose between two alternatives of a proposed reorganization. They were asked to rank these hypothetical reorganizations based on some pieces of information over the effects of the reorganization on certain goals. We also asked their preference based on the complete set of information and we asked their goal rankings. Based on the information (or cognition) and their goal rankings we calculated an 'overall consequence' of each reorganization, which correlated highly with their attitude (contribution A). Then we performed as-if analysis on couples in our dataset. Of all pairs of respondents that initially agreed on which alternative was best, only 2.9 percent both preferred the other alternative in the hidden profile, while 29 percent would end up in conflict in the full information case. Thus sharing only preference consistent information would result in a suboptimal decision in only 2.9 percent of the cases and would prevent conflict in 29 percent (contribution E).

CONCLUSIONS AND DISCUSSION

Our first aim was to answer the question which cognitive differences between employees concerning the consequences of organizational change result in conflicting attitudes towards that organizational change. Our second research question concerned the relative impacts of social context and intrapersonal consonance in explaining these differences.

In order to answer the first question we have theoretically elaborated and empirically validated the link between cognitions about and attitudes towards an organizational change. In chapters II, III and V our measure for a weighted average consequence of the change, correlated highly with attitude towards change. So, individuals who expected a change to have a more positive effect on certain goals are more likely to stronger support the change, especially if the positive effect concerns goals they consider highly important. This correlation

indicates that our method to collect causal cognitive map data on a preselected set of nodes and links, including goal priorities, results in usefully interpretable data. Furthermore this correlation between the perceived total effect of the change and attitude towards the change results in a brief answer of our first research question: different attitudes towards the change are grounded in different causal reasonings and / or different priorities assigned to the goals that are influenced by the change.

However, our findings allow a more detailed answer. In Chapter II we have contributed to the literature through developing and demonstrating an approach enabling us to distinguish different types of conflicts, namely goal conflicts and cognitive conflicts. In Chapter III we have focused on cognitive conflicts and analyzed causal reasoning consisting of several steps (e.g. after a merger employees would have increasing or decreasing levels of responsibility, which had an effect on the level of collaboration, which influenced the quality of output). We found that conflict was not necessarily mainly rooted in steps in the cognition on which variance was large. By taking into account whether a step in the cognition is part of several reasonings, i.e. whether it is related to a concept that has effects on several goals, we were able to detect which cognitive differences contributed most to the level of conflict.

In Chapter V we found that individuals having different goal priorities could still have opposing attitudes towards changes, even if they have similar information concerning the consequences of the change. In this study we included personal goals such as income and status as well as collective goals such as helping others and providing equal opportunities for people. The relative priority individuals assigned to personal goals correlated with one another, as well as the priority assigned to collective goals. However, for some individuals personal goals were more important than collective goals, while for others this was vice versa. This indicates that if organizational changes will have impact on both personal as well as collective goals, goal conflicts are likely to appear.

This leads to a more detailed answer of our first research question: which cognitive differences between employees concerning the consequences of organizational change result in conflicting attitudes towards that organizational change?

Conflicting attitudes are mainly due to differences in causal reasoning and less so to differences in goal priorities. Especially causal cognitive differences that are part of several reasonings of the consequence of a change on the goals, contribute to the level of conflict. Both goal conflict and cognitive conflict occur concerning changes that affect both personal as well as collective goals.

Besides answering the question which cognitive difference result in conflicting attitudes, we were also interested in cognition formation: to what extent are cognitions shaped through social context and to what extent through intrapersonal consonance? This was the focus of Chapter IV. We found that department and hierarchical level explained employees' cognition, i.e. the cognitions of employees within the same department or hierarchical level is more similar than the cognitions of employees from different departments or hierarchical level. However, even accounting for background characteristics, the cognitions concerning the different effects of a change on several goals, correlates within individuals. This means that if an individual expects a strong positive effect from a change on one goal, he is likely to also expect positive effects from the change on other goals. Or if he also expects negative consequences of the change, that he either expects these effects to be small, or that he assigns low priority to the goals it concerns.

This brings us to answering our second research question: What are the relative impacts of social context and intrapersonal consonance in explaining individuals' cognitions?

Both social context (being member of the same department or hierarchical level) as well as intrapersonal consonance explains the cognition of employees concerning the consequences of organizational change.

We argue that answering the first research question, i.e. identifying which cognitive differences result in conflicting attitudes, is crucial in order to resolve conflict. Scholars from different fields have argued that cognitive conflicts are

likely to be resolved through information exchange, persuasion or discussion, while goal conflicts can be resolved through negotiation or logrolling (e.g. Deutsch, 1977, 1994; Mohammed & Ringseis, 2001; Tjosvold, 1985, 2008; Udehn, 1996; Stokman et. al., 2013). Indeed we found that cognitive conflict can be resolved if information is exchanged (i.e. cognitions are aligned) between individuals having similar goal priorities. But based on the same cognition individuals with different goal priorities were still in conflict (Chapter V). From this study we can conclude that goal conflict exists and that it not resolved through discussion or information exchange.

In chapter II and III we have assumed that discussion between employees will align their cognitions. We found some evidence for this assumption. We found that cognitions of employees belonging to the same department or hierarchical level are more similar than the cognitions of other employees (Chapter IV). Assuming that members of the same department or hierarchical function interact more with one another (Lazarsfeld & Merton, 1954; McPherson, Smith-Lovin & Cook, 2001), this suggests that information exchange indeed results in more similar cognitions. Social interaction leads to social influence (Festinger, Schachter & Back, 1950) and individuals adopt their cognitions to individuals with whom they interact (Abelson, 1964; Brass, Galakiewicz, Greve, & Tsai, 2004; Kerr & Tindale, 2004). Based on this reasoning, Lau and Murnighan (1998, 2005) argued that polarization in cognitions (or opinions) will occur if there are so-called 'demographic faultlines'. This means that if work teams consist of groups that differ on several demographic attributes, e.g. a group of young high-educated women and a group of older low-educated men, polarization in cognitions can occur. The individuals will interact more with the similar individuals and their cognitions will tend to the average cognition within that group. Even more, they might reject arguments of members of the other group (Flache & Mäs, 2008).

Our findings that social context explains cognition is in line with faultline theory. However, we still found variation within the cognitions of employees with similar background characteristics. In our analyses we controlled for background characteristics and still found covariances between the change impact perceptions within individuals to differ significantly from zero. This

means that besides social influence, cognition is partially shaped through cognitive consonance.

The fact that cognitions are consonant also suggests that employees are likely to assign less value to arguments that are not in line with their attitude towards the change, than to arguments that are in line with their attitudes. The reduction of cognitive dissonance can result in situations in which both supporters and opposers of the change do not change their attitudes towards the change, even if in discussions new argument are brought in. On the other hand if employees discuss and then change their cognition on some parts, they might also adjust other parts of their cognition, in order to end up with a consonant cognition.

Our results in Chapter V do not only show that information exchange is not likely to resolve goal conflict, it shows that it can even reveal a latent conflict between individuals having different goal priorities, although they had similar attitudes towards the change prior to the discussion. Our analyses proposed in Chapter II and III proves useful in indicating whether it is useful to stimulate discussion between employees. In order to prevent polarization of cognitions, it should be stimulated that all employees exchange information.

In Chapter II and III we have assumed that after discussion employees would end up having an 'average cognition'. This assumption could be unrealistic in groups in which information is distributed unequally. If some information is only known to some people (and new for a large group of people) this information will have more impact than information that is known to a majority of the group (Chapter V, compare also example I in which the combined cognitive map of Anna and Bill deviated strongly from their 'average maps').

Empirical contributions

To answer our research questions we argued that data were needed that captured individuals' cognitions concerning the effects an organizational change would have on several (organizational and personal) goals as well as the relative priorities assigned to reaching each of those goals. We have collected cognitive map data using a questionnaire, which we constructed after interviews with several employees. Although this approach limits respondents to giving their

cognitions pertaining to only those links that are included in the questionnaire, it does result in comparable cognitive maps of a number of respondents. We have presented a new measure for a weighted average consequence of the change, which correlated highly with independently measured attitudes towards the change. Since we were able to derive from the cognitive data which employees would be more or less supportive of the change, we believe that our way of collecting the data has been suitable for our purpose.

We have presented methods to analyze whether conflict is mainly rooted in cognitive differences or different goal priorities (Chapter II) and how to detect which cognitive differences contribute most to divergent attitudes in a group (Chapter III). By applying existing multi-level analysis techniques in a new context, we were able to analyze how cognitions are correlated within individuals, controlling for background characteristics (Chapter IV). Finally we have extended the hidden profile paradigm to decision making among individuals with different goal priorities (by including personal and collective goals), and have shown that withholding information can prevent conflict in such situations (Chapter V).

Limitations and future research

In the food inspection agency (Chapter III) we have collected maps on a large set of nodes, but the goal ranking data were collected ordinally. Therefore we had the exclude the goal priorities in our analyses in this chapter. In the forensic psychiatric center and the organization for youth welfare work, the goal priorities were measured on a ratio scale, allowing us to differentiate between cognitive conflicts and goal conflicts (Chapter II) and to analyze cognitive consonance (Chapter IV). However, the maps consisted only of direct effects from means to each of the goals. Therefore in Chapter II we were able to identify cognitive conflicts, but analyses concerning which cognitive differences contributed most to this conflict (as we did in Chapter III) were not possible.

Our data are cross-sectional. In Chapter III we have analyzed which cognitive differences between employees contributed most to divergent attitudes, i.e. to the level of conflict. We suggested that discussing these particular parts of the

cognition, is likely to resolve conflict most. In order to test whether this is indeed the case, longitudinal data are needed, including intermediate events (particularly which causal links have been discussed and which 'hard figures' about the extent to which goals where reached have been reported). Ideally an intervention study is set up in which a group of employees is divided into two groups and one of the groups discusses the links that are proposed by our method, while the other group discusses arbitrary links (or just discuss as they used to do) and to test whether the conflict reduced more in the former groups.

Our approach to calculate a measure of the total effect of an organizational change as weighted average of the effects on each of the goals (weighted with goal priorities) works well with unidirectional maps. If the cognitive map would include feedback loops this approach is problematic. A feedback loop occurs if concept A has a direct or indirect causal effect on concept B, while a change in concept B also affects concept A. These loops can be positive (self-reinforcing) or negative (self-correcting) (Sterman, 1989, 2001; Morecroft, 2015). Examples of self-reinforcing loops are arms races (more weapons in country A will lead to more weapons in country B and vice versa) or price wars (lowering prices will make competitors lower their prices and in response to that ones own prices should decrease etc.) (Sterman, 2001). An example of a negative feedback loop is constructing more roads in order to resolve congestion. In the short run congestions might be resolved, but consequently driving becomes more attractive and more people will use the road resulting in congestions (Morecroft, 2015). Scholars have argued that the cognitive maps (or mental models) of individuals are often too simple and that recognition of feedback loops is crucial for decision making in dynamic setting, i.e. in setting in which decisions are made repeatedly, such as decisions on stock quantities (Sterman, 2001; Morecroft, 2015). For organizations it is crucial to learn from feedback loops that occurred after previous organizational changes (March, 2006; Levitt & March, 1988). Feedback loops can occur if an organizational change will lead to response of others (a changing environment). Feedback requires time; in the example of congestion, road construction will initially resolve the problem but in the long run more people are likely to use the road and congestions will reappear.

We have collected cognitive maps by asking the perceived effect between a limited number of concepts, i.e. we limited the number of causal links within the maps. These limited sets of links did not include feedback loops (cycles). The reason for this limitation is first of all that feedback loops hardly appeared during the interviews with employees. The organizational changes we focus on (such as a merger or decentralization) are not dynamic; similar decisions are not made repeatedly and the environment will hardly change (the changes are not likely to trigger response from other organizations).

One positive feedback loop that did appear during the interviews was between job satisfaction and quality of output. We asked whether that loop was continuous, implying that after increasing quality in the long run both job satisfaction and quality would unlimitedly increase. All interviewees indicated that this was not the case and that the effect from job satisfaction to quality of output was stronger than the opposite effect. Positive feedback loops do exist, but in the long run they are likely to reach a border. In the arms race the impact of having more weapons will diminish if all parties already have (too) many weapons. In a price war a lower limit will be reached if increasing the price more will result in bankruptcies. We argue that the long run effect of a positive feedback loop can be captured in a unidirectional effect, for instance from job satisfaction to quality of output. In the interviews negative feedback loops did not occur. Suppose a negative feedback loop would exist between concepts of which we asked only a unidirectional causal effect in our survey, this (long term) unidirectional effect would be zero. For example, individuals who belief that road construction in the end will not resolve congestion, in our approach could indicate that there is no effect from road construction to congestion.

The cognitive maps of individuals are unlikely to capture 'the real world' and are mostly a simplified version (Doyle & Ford, 1998; Sterman, 2001). The fact that we found individuals having different cognitive maps implies they cannot all be 'right'. For our research it is no problem that individual cognitive maps give an oversimplified version of the real world. Even the fact that by collecting cognitive map data on a limited number of links and concepts, excluding feedback loops and concepts (subgoals) that might be part of the cognition of some employees, is not so problematic for the purpose of our research. After all

our aim is not to decide which employees have the best cognitive maps, i.e. to identify the employees whose perceived effects from the change on the goals appears to be closest to the actual effects on the goals. Our aim is to explain why some employees oppose a specific organizational change and why others support it, based on their causal cognition. Our data would be worthless if in our limited set of concepts and links endgoals are missing on which the organizational change has quite a strong effect according to several employees. We have tried to prevent this by a pilot of the questionnaire. We included the possibility to mention other relevant consequences of the change in an open question and no other endgoals were mentioned.

By excluding the possibility of feedback loops our maps are less detailed than when we would have included possible feedback loops. For instance if two individuals would indicate that road construction will have no effect on congestion, it could be that one of them does not see any effect, while the other perceives the feedback loop. In Chapter III we present an approach for finding links on which divergent cognitions between employees contribute largely to different attitudes towards a change. Suppose the variance in attitudes towards road construction is to a large extent due to the fact that some expect road construction to result in a strong decrease of congestions while others expect no effect on congestions. Then this would be an interesting link to discuss. During this discussion the reasoning containing the feedback loop (lower congestion rate results in attrition of drivers, which increases congestion rates) is likely to be brought up. By excluding feedback loops, we do not know whether according to the respondents feedback loops exist. However, unidirectional maps allow us to analyze divergence on which links contribute most to conflicting attitudes towards a proposed change, and during discussion of that link more detailed arguments will come up. So although we agree that maps with a limited set of concepts, no cycles and only linear effects are likely to give an oversimplified version of the real world (Sterman, 2001; Doyle & Ford, 1998), we argue that the cognition of most individuals is indeed oversimplified and the cognitive map data that we have collected suffices for the purpose of our research. For future research it would be interesting to collect cognitive data capturing more detail, for instance by allowing feedback loops and by asking whether an increasing

effect between concepts over time is linear or increasing or decreasing ascending.

We have argued that cognitions are partially shaped through social interaction (Chapter IV). In our analysis we have included department and hierarchical function, which can be regarded as a proxy for social interaction. In order to analyze whether individuals who interact more with one another indeed have more similar cognitions, network data is needed.

In our study on collective decision-making between individuals with potentially different goal priorities (Chapter V), we have performed as-if analyses in order to predict in how many situations conflict would increase (or would even be created) if decision makers would exchange all information. Future studies in which decision makers actually exchange information, either face-to-face or via digital messages, will give insight in the actual information exchange between decision makers. We have argued that in decision making groups in which goal priorities are aligned (and this is known to all decision makers) complete information exchange prior to the decision making, is more likely than in groups in which goal priorities are not aligned. This could be tested in experiments in which decision groups get information concerning the goal priorities of the other decision makers.

In the current studies we have collected data capturing the personal cognitions and goal priorities. In in-depth interviews respondents also had some views of the cognition and goal priorities of other employees. An area for future research would be to collect data within organization in which individuals are asked to give the perceived cognitive map and goal ranking of significant other organizational members (team members, managers, other departments). These data tell whether employees perceive to be in harmony with others. And if they believe that there are conflicting attitudes, whether that is due to cognitive differences or different goal rankings. If such data are collected the *perceived game structure* concerning the organizational change is known. This can explain the resolution strategy, such as negotiation or information exchange, and whether all information is exchanged or only preference consistent information.

In chapter II we have argued that our method to distinguish whether a conflict mainly has the nature of a cognitive conflict or a goal conflict can shed light on inconsistent findings in the literature on team performance. Some scholars argue that conflict results in more information exchange, prevents groupthink and therefore results in qualitatively better decisions, which results in better team performance. Others argue that less conflict in teams results in easier decision making and thus in better team performance. An explanation for inconsistent findings can be that cognitive conflicts in these studies are measured on a scale that partially includes different goal rankings. We suggest that in groups with similar goal priorities, more cognitive conflict indeed results in more information exchange and qualitatively better decisions, resulting in better team performance. If on the other hand, goal priorities differ among team members, cognitive conflict is likely to result in strategic (preference consistent) information exchange, in which conflicts are often not resolved. This likely results in lower team performance. With our data we are able to analyze whether there is goal conflict or cognitive conflict. However, we do not have measures for team performance or successful implementation of change. Ideally in future studies cognition and goal priorities concerning changes are measured as well as measures for performance or successful implementation.

We have limited ourselves to cognitions and conflict concerning organizational changes. Organizations are a good setting for our research, since organizational changes are relevant for the employees. Most of them have an opinion whether the organizational change is good and they have arguments why they support or oppose the change. Furthermore we are interested in two parts of the cognition concerning the policy changes, namely the effect that a policy change will have on reaching certain goals, according to different individuals, and the priorities they assign to these goals. The focus on the priorities that individuals assign to the goals is particularly interesting if these priorities differ between some individuals. Employees are likely to assign similar priorities to some goals and different priorities to other goals, for instance because they are in different hierarchical positions or work in different departments. However, most of our research questions and our methodological approaches are also relevant outside the field of organizations, for instance for

research on the support of policies in the political arena. Through comparison of the cognitive maps and the goal priorities of voters and political parties, insight can be gained in whether voters support a party for what they strive for (goal priorities) or how they sell it (cognition).

Practical implications

If employees have the same goal priorities, exchange of all information is beneficial. There is no incentive to withdraw information. However, groupthink is lurking. If all employees have the same goal priorities, they might not look further for more arguments or information once they have the idea that they have exchanged all information and agree. In order to stimulate that employees keep on collecting arguments both in favor of a change as well as arguments opposing the change, it is necessary to emphasize the common goal priorities.

The method from chapter II can be used to detect whether employees are in goal conflict or in cognitive conflict. If they are in cognitive conflict the approach from chapter III can be used in order to detect which cognitive differences contribute most to the divergent attitudes.

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II. DISCUSSING THE ROUTE OR THE DESTINATION*

COGNITIVE CONFLICT OR GOAL CONFLICT

ABSTRACT

In conflicts between management and employees over proposed organizational changes, we distinguish *goal conflicts* and *cognitive conflicts*. The former occur when management and employees have different priorities concerning ultimate goals, the latter if they have different causal beliefs about how effective the proposed organizational change is in reaching those goals. We use a cognitive mapping approach to measure causal cognitions concerning the effects that specific organizational changes have on goals. We derive a measure from the maps that explains the attitude towards the organizational change to a large extent. Demonstrating the usefulness of our approach for conflict resolution, we find, in data concerning changes in two Dutch organizations, that the attitude of employees towards these organizational changes would become significantly more positive if they would adopt the causal cognition of management, compared to their adoption of the goal priorities of management.

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INTRODUCTION

Planned organizational change often triggers disagreement or resistance from those who feel negatively affected by the proposed organizational change, whereas those proposing the change usually do so because they expect it will accomplish some predefined goals (Cyert & March, 1963; Katz & Kahn, 1978; Balogun & Johnson, 2004). The resulting conflict can have two fundamentally different sources, namely, differences in goal priorities or differences in cognition, between opponents and proponents.

In a *goal conflict,* the conflicting parties have different goal priorities (Dearborn & Simon, 1958; Bourgeois, 1980). For instance, the head of production may find product quality more important than sales volume, while the reverse may be true for the head of sales. In a *cognitive conflict,* the parties disagree about how much a proposed organizational change will contribute to the achievement of certain goals, but they do not necessarily have different goal priorities (Hammond, Tood, Wilkins, & Mitchell, 1966; McGrath, 1984). For example, both the head of production and the head of sales might agree that cost reduction should be assigned the highest priority in a change effort, but they might have opposing opinions about how the implementation of an expensive management information system might help realize this objective. Put differently: in a goal conflict, parties disagree about where to go; in a cognitive conflict, they agree about the destination, but disagree about how to get there. This distinction between goal conflict and cognitive conflict is similar to the distinction between value conflict and belief conflict made by Deutsch (1973).

Improving our understanding of the different bases underlying conflict over change efforts is important when it comes to selecting effective conflict resolution strategies such as rational persuasion or negotiation, and to exploiting the potentially beneficial effects of conflict for organizational performance. Research has shown that rational persuasion appears to be best suited for the resolution of cognitive conflicts and less so for goal conflicts (Alexander, 1979; Mohammed & Ringseis, 2001; Tjosvold, 1985; Tjosvold, 2008). Moreover, goal conflicts are commonly seen as mainly having disadvantages, whereas, conversely, a certain level of cognitive conflict has been found to overcome

groupthink (De Dreu, 2006; Janis, 1982) and to lead to more creative solutions (Hambrick, Cho, & Chen, 1996).

Planned organizational change provides a particularly relevant test case for studying the comparative prevalence of goal conflicts and cognitive conflicts in dissension about the desirability of the proposed organizational change. Research on resistance to organizational change is abundant (Weick & Quinn, 1999; Piderit, 2000; Ford, Ford, & d'Amelio, 2008) and has identified a wide variety of factors that trigger negative attitudes towards or active resistance against proposed organizational changes. Where organizational change is analyzed in a context of conflict, the nature of the conflict usually is not explicated. The implicit assumption of most studies seems to be that there is a goal conflict. In other words, employees are simply assumed not to share management's goal ranking. For example, management may define increased shareholder value as the most important goal of an organizational change, whereas employees might consider better working conditions as the most important priority. Change efforts that are badly aligned with or violate the interests of employees can be expected to be a strong trigger for resistance to the organizational changes, while goal congruence between employees and management is found to be positively related to employees' commitment to the organization (Colbert, Kristof-Brown, Bradley, & Barrick, 2008).

Not all conflict is necessarily goal conflict and it is important to recognize its possible cognitive origin. In line with this, several scholars contend that conflict in organizations is not so much rooted in conflicting goals as in conflicting cognitions (e.g., Brehmer, 1976; Jehn, 1997; Mohammed & Ringseis, 2001). Divergence in causal cognitions has moreover been linked to the success or failure of implementing a new organizational change. In early studies on the subject, Bartunek (1984) and Isabella (1990) have argued that successful implementation of organizational changes requires the transformation of cognitions, in the sense that to make the organizational change successful, the causal cognitions of organizational members need to be aligned. Several subsequent studies have shown that organizational changes that go against established causal cognitions are likely to lead to resistance to the change projects (Reger, Mullane, Gustafson, & DeMarie, 1994; Labianca, Grey, & Brass,

2000). Similarly, the emergence of new shared knowledge structures (i.e., cognitions) is seen as a precondition for the success of negotiations about the implementation of a specific organizational change (Bonham, Sergeev, & Parshin, 1997).

Of course organizational changes will be more successfully implemented if both employees' causal cognitions and their goal priorities are more congruent with those of management. However, in some cases it might not be necessary to align both cognition and goal priorities, in order to reduce conflict. In research on conflict in organizations, the distinction between goal conflict and cognitive conflict is hardly made and often conflict is measured on a general level, and does not concern a specific organizational change. Although there is no lack of typologies for interpersonal conflict (Wall & Callister, 1995; Deutsch, 1973), organizational scholars have largely neglected the distinction between goal conflict and cognitive conflict in their empirical research. The distinction between consensus over the priorities of goals, or objectives, and consensus over the priorities of organizational changes, or means (Bourgeois, 1980; Dess, 1987), comes closest to the distinction we make. However, the degree of consensus over the priorities of organizational changes differs from cognitive conflict, because the former only indicates which organizational changes are relatively more important to different actors, while it remains unclear whether this is due to different goal rankings or to the differing expectations of the effects that the organizational changes will have on goals. In the extreme case, if individuals agree on the contribution of the organizational change to the achievement of the goals, the ranking of organizational changes is identical to the ranking of goals.

In research on the effect of conflict on team performance, scholars distinguish a cognitive component of conflict and an emotional component, also referred to as affective conflict (Amason & Sapienza, 1997) or relational conflict (Jehn, 1997; Jehn & Mannix, 2001; De Dreu, 2006). These are personal clashes in which individuals feel tension, rivalry and anger towards one another. Several studies have shown that affective conflict is bad for team performance, while a certain level of cognitive conflict improves team performance if it is managed well (Jehn, 1995; De Dreu & Van de Vliert, 1997; De Dreu, 2006; Amason, 1996; Mooney, Holahan, & Amason, 2007). These studies however differ from the current paper

in that the concept of cognitive conflict was measured on psychometric scales (Jehn, 1994; Pelled, Eisenhardt, & Xin, 1999) in which differences in goals or values were also included. Furthermore, these scales measured a general level of cognitive conflict about tasks in teams, and did not measure whether individuals had different cognitions about expected consequences of specific actions or organizational changes. In the current paper we clearly separate differences in cognitions from differences in goal priorities, and all such differences are related to specific organizational changes. Therefore we will use the so-called cognitive mapping approach (e.g., Axelrod, 1976; Huff & Jenkins, 2003; Eden & Ackermann, 2004). In real life, individuals also make judgments about the effects an action ("means") will have on outcomes ("goals"), based on folk theories that individuals use in order to make sense of their environment, for example, when estimating the consequences of organizational changes (Sims & Gioia, 1986; Walsh, 1995). These individual beliefs about the consequences of organizational changes can be elicited in "maps", in which the organizational changes and the goals affected by them are represented by nodes, with the causal relations between them being indicated by signed arrows connecting those nodes (see Figures 1 and 2 for a simple examples of such maps). This technique allows for a more fine-grained, issue-related assessment of cognitive conflict than do the other approaches to cognitive conflict discussed above. Because cognitive maps express cognition about the expected causal consequences of an organizational change, they enable us to measure cognitive conflict in terms of the differences between individuals in terms of their cognitive maps. This operationalization of cognitive conflict is comparable to the concept of cognitive conflict as introduced in small group research (Hammond et al., 1966; Brehmer, 1976; McGrath, 1984). There cognitive conflict is defined as differential judgments concerning the consequences of a course of action, i.e. an organizational change. They used laboratory experiments, in which subjects are primed with different cause-effect cognitions and are instructed to predict future outcomes based on these cues (Hammond et al., 1966; Alexander, 1979) and make decisions in groups (Cosier & Rose, 1977). Instead of experimentally inducing cognitions, in the current paper we will use cognitive map data capturing actual cognitions.

In research using cognitive maps (e.g., Eden & Spender, 1998; Huff & Jenkins, 2003), individual maps are usually aggregated to group maps, leaving crucial inter-individual differences unexplored (but see for instance Langfield-Smith &Wirth, 1992; Langan-Fox, Code, Langfield-Smith, & Wirth, 2001; Markóczy & Goldberg, 1995 for exceptions). Moreover, only recently have scholars begun to address the issue of different individuals assigning different priorities to the goals in the maps (Stokman, Van der Knoop, & Van Oosten, 2013; Stokman, 2009). The proposed index of dissension from Hall (1999) is also rooted in his acknowledgement that the best means, according to the aggregated group map, might not be implemented if in the group the dissension concerning the consequences of that means is great, but his index does not specify whether dissension is due to cognitive differences or to different goal priorities. In the current paper we propose a measure that does enable us to clearly distinguish cognitive conflict from conflicts due to differences in goal priorities in cognitive maps, and that allows for identifying the extent to which both sources of conflict contribute to the overall conflict.

We will focus on the differences between management on the one hand and employees on the other, concerning their causal cognition about the effects of certain organizational changes on goals and concerning their prioritization of these goals. Employees, who adopt both the causal cognition and the goal priorities of management, will likely be as positive about the organizational change as management is. Conflicts between management and employees can arise through differences in cognition or goal priorities. As Markóczy (2001) has noticed, most research has focused on consensus among members of top management teams, while the scope of consensus – the degree to which ideas are widely shared across different groups of organizational members – has been identified as being particularly crucial in the successful implementation of an organizational change (Wooldridge & Floyd, 1989).

The aims of the current paper are to (a) develop a comprehensive measure relating individuals' cognitive maps to their attitudes towards the organizational change under consideration, and (b) demonstrate how this measure can be used to separate cognitive from goal conflict in any real-life conflict between management and employees.

Overview of the chapter

In the next section we will theoretically elaborate on cognitive conflict and goal conflict. Then we will present our measure, derived from the cognitive map, predicting the attitude towards the organizational change. Using data from two reorganizations in two Dutch organizations, we will then show that our measure indeed explains attitudes towards the organizational change, controlling for organizational and demographic background characteristics of the employees. Then we will perform 'as if'-analyses, by assigning respectively the cognition and the goal prioritization of management to each employee and analyze to what extent the employees would become more positive towards the organizational change. This method allows us to identify the extent to which a conflict between employees and management is mainly rooted in cognitive differences or in different goal priorities. We conclude with a discussion.

CONFLICT TYPES RELATED TO COGNITIVE MAPS

Two individuals are in conflict over an organizational change if one individual opposes the organizational change, while the other supports it, thus if they have opposing attitudes towards the measure. According to our theory the attitudes towards the organizational change are determined by the benefits and drawbacks the individuals expect to result from the organizational change. The size of these perceived benefits and drawbacks depends on (a) an individual's causal cognition, that is, the extent to which an organizational change, according to the individual, will have positive or negative effects on the achievement of the goals, and (b) the relative priorities this individual attaches to each of these goals.

Goal Conflict

Figure 1 presents the hypothetical cognitive maps of individuals *A*, *B* and *C* for the proposed organizational change "regionalization". As shown in Figure 1, the organizational change affects two separate goals: "cost reduction" and "quality of treatment". The effects are indicated by arrows pointing from the organizational

change to the goals. The signs alongside the arrows indicate whether the individual believes the effect on the goals to be positive (+) or negative (-). For ease of exposition, we now assume these effects only to differ in sign, not in intensity. In our measures of conflict presented below we do allow for differences in intensity.

The arrows and signs together depict the individual's beliefs about the effects the proposed organizational change will have on goals. The ranking of the goals by each individual is indicated by underlining the more important goal. We assume throughout that all individuals agree that the more a goal is reached, the better. However, some goals have higher priority than other goals, and individuals can differ in their goal ranking.

In the cognitive maps of Figure 1 all individuals perceive both drawbacks and benefits from the proposed organizational change. Moreover, individuals *A* and *B* agree on the effects the organizational change will have on each goal: both expect a positive effect on cost reduction and a negative effect on quality of treatment. However, *A* and *B* differ in the priorities they assign to these goals. *B* considers quality of treatment to be more important than cost reduction, whereas the reverse is true for *A*. Since they agree that the regionalization results in more cost reduction and less quality of treatment, *A* can be expected to *support* the regionalization, whereas *B* is likely to *resist* it. In this example, *A* and *B* are in a goal conflict: they *agree on the effects* that the proposed organizational change will have on the goals (i.e., they have *cognitive consensus*), but assign *different priorities* to these goals. These different goal priorities can be rooted in self-interest, for instance if job satisfaction is at stake, but opposing parties can also be concerned about the organizational change harming organizational goals (Piderit, 2000).

Figure 1. Hypothetical maps of individual A being in goal conflict with B and in cognitive conflict with C. The underlined goals are the goals with highest priority.

Cognitive Conflict

If individuals agree on the goal priorities, conflict can only arise through differences in cognition concerning the effects of an organizational change on these goals. In Figure 1 a pure case of cognitive conflict between individual *A* and *C* is depicted: *A* believes that the regionalization will lead to more cost reduction, while *C* believes that the organizational change will lead to less cost reduction; in addition, *A* believes the organizational change will be detrimental to quality of treatment, whereas *C* believes the organizational change will be conducive to it. *A* and *C* agree on the priority ranking of the goals, but disagree about the effects the proposed organizational change will have on quality of treatment and cost reduction. Again for the moment assuming equal intensity of the effects, *C* can be expected to oppose the organizational change, whereas *A* is likely to support it. We should emphasize that for a cognitive conflict it is not necessary that the individuals expect opposing effects on goals if strength can be assigned to the effect from the organizational change to the goals. If individual *C* would agree on the signs that *A* assigned, but for instance believes that the positive effect on cost

reduction is nil, while the negative on treatment quality is large, *C* might still oppose the regionalization and be in a cognitive conflict with individual *A*.

Mixed Conflict

Real-life conflicts will generally be a mix of the two pure conflict types described above, where individuals will differ in *both* causal cognition *and* goal priorities. In those cases, individuals might even end up *agreeing* on the desirability of the proposed organizational change despite differences in goal priorities and cognition. An example of such a situation is given by individual *B* and *C* in Figure 1. In this case, both individuals oppose the organizational change, although (or rather, *because*) they differ in causal cognition as well as in goal prioritization. If in such a situation, individual *B* would successfully convince *C* of the correctness of his (*B*'s) cognition, *C* would come to support the organizational change and vice versa. This illustrates the counter-intuitive fact that successful persuasion can *increase* conflict, depending on the initial differences between cognitive maps and goal priorities of the dissenting actors. This underscores the importance of identifying the correct sources of conflict and their relative prevalence.

DERIVING ATTITUDES FROM COGNITIVE MAPS

We expect that the attitudes of employees towards the organizational change will be based on its perceived effects on important goals. We denote the weight of the causal effect from the organizational change *m* on a goal g_i as w_{m,g_i} and the priority - or salience - assigned to that goal as s_{g_i}. We calculate the expected total result $TR(m)$ of the organizational change *m* as the weighted average of the causal cognitions, with the priorities as weights (Septer, Dijkstra, & Stokman, 2012). Such a weighted average is also used as a utility function in the field of multicriteria decision analysis (e.g. Raïffa and Keeney, 1976).

$$TR(m) = \frac{\sum_{i=1}^{n} w_{m,g_i} \cdot s_{g_i}}{\sum_{i=1}^{n} s_{g_i}} \qquad (1)$$

We consider employees to be rational in the sense that they base their attitudes towards an organizational change on the consequences they expect from it. Thus we expect that the attitudes of employees are to a large extent explained by the total result they assign to the organizational change, as formalized in equation (1). Note that since equation (1) does not involve attitudes of other employees or of management, we ignore possibilities of *strategic* rationality. We argue that in the context of a single proposed organizational change, this assumption is not overly restrictive. However, if one were to consider multiple proposed policy alternatives, one would expect strategic position taking to become more important. For instance, an individual might support an alternative not because she believes it to be the most beneficial of all alternatives, but rather because she believes it is the least harmful alternative for which there is a majority. In those cases, one could still fruitfully use equation (1) to investigate to what extent position taking is indeed strategic, or to what extent it is motivated by the subjectively expected consequences of the organizational changes. Thus, we formulate the following hypothesis.

Hypothesis: Employees' attitudes towards an organizational change are explained by the total result they assign to the organizational change, in the sense that a higher positive result will correspond to a more positive attitude.

If this hypothesis holds, an employee's attitude towards an organizational change will change if the total result he expects changes. This total result will change if the cognitive map of an employee is changed, either in terms of the expected consequences of the organizational change or in terms of his goal priorities. Before we will discuss ways to investigate whether a larger change in total result will be affected by changing employees' cognitions or by changing their goal priorities, we will investigate whether the hypothesis stated above is supported by data from two Dutch organizations, concerning two new organizational changes in each organization.

RESEARCH DESIGN AND DATA

Organizational Context

Our data were gathered from two public Dutch organizations with a few hundred employees each: a youth welfare work organization and a forensic psychiatric center. In both organizations we studied two organizational changes that impacted a large group of employees. These organizational changes were episodic rather than continuous (Weick & Quinn, 1999), representing occasional interruptions intended to reach specific goals.

The data in the youth welfare work organization were collected in spring 2008. Two years before, two reorganizations had taken place that influenced the work of quite some employees. The first was a decentralization measure; the care was divided over three regions. The aim of this *regionalization* was to deliver the care in a fashion that was 'closer to the clients', both in terms of physical and cultural distance (e.g., caregivers commanding the client's dialect). A second organizational change was the so-called *client flow* approach, in which the care for clients is based more directly on the needs of the client than previously, matching particular stages of their treatments. Among other things, this organizational change involved new procedures for monitoring the stage of the treatment using a new computer program that indicated when certain health reports had to be written.

In the forensic psychiatric center, one organizational change involved a *privatization* of the organization, which until then had been part of the Dutch Ministry of Justice. This organizational change was not initiated by the management of the organization, but was a consequence of a political decision at the national level. Whereas management was in favor of the privatization, the organizational change evoked mixed reactions among employees. The second organizational change was a restructured *care program*, with more customized care for the clients. Data were collected in spring 2007, after the decisions that the policy would be implemented were made, but prior to the actual implementation.

Data were collected in three steps. First we conducted in-depth interviews to elicit salient goals and cognitive maps, then we conducted a pilot study and finally we administered an employee survey using questionnaires.

In-depth Interviewing

In both organizations, cognitive maps about the consequences of the organizational changes were gathered through semi-structured face-to-face interviews (Huff, 1990; Huff & Jenkins, 2003) among ten key employees of each organization holding different positions and working in different divisions. The interviews were held at each organization's head-office and lasted for an average of one and a half hours. Interviews were audio taped and subsequently transcribed. Respondents were asked what, according to them, were the most important reasons for implementing the organizational change, and in particular what the intended consequences were. This resulted in a list of goals at which the organizational change was manifestly aimed, such as increased productivity or reduced costs. Respondents also indicated whether they expected additional, not officially intended consequences from the organizational change, be they positive or negative. This resulted in a comprehensive list of goals that would be affected by the organizational change, according to the respondent. These goals included both organizational goals such as productivity, and personal goals such as job satisfaction. After respondents had given their personal views, they were asked whether they knew of alternative cognitions held by other employees and what these cognitions were. If respondents mentioned that they thought that the organizational change would increase the likelihood of the achievement of a certain goal, we asked why in their opinion it was good to reach that goal in the first place. Sometimes the goal then turned out to be a sub-goal leading to the achievement of a different ultimate goal. In this way the complete causal reasoning from means to ends was mapped for each goal and each respondent. If respondents did not mention cognitions that had been mentioned by others in previous interviews, we checked whether they were aware of those cognitions and asked them whether they believed the causal reasoning expressed in them to be valid. We also crosschecked terminology used by other respondents in order to clarify whether or not different terminology indicated different or identical concepts. The interviews produced detailed cognitive maps for each respondent and revealed the most important goals affected by the organizational change.

We selected those goals that were mentioned in at least two in-depth interviews as being positively or negatively affected by the organizational change and included questions in the survey about the expected causal effect of the organizational change on these goals. In the youth welfare work organization, the most important goals affected by the organizational changes were uniformity in the way work was done, the level of service towards the clients, the level of information exchange among employees, job satisfaction of employees and reduction of workload. In the forensic center, the important goals affected by the organizational changes were the quality of treatments, employees' job satisfaction and cost reduction.

Pilot Study

Following the in-depth interviews, we conducted a pilot study among five to seven respondents of each organization, different from those interviewed in the in-depth interviews, in order to test the questionnaire, fine-tune the terminology and collect comments with which we could improve the questionnaire.

Employee Survey

In the youth welfare work organization, paper questionnaires were sent to the home addresses of a random sample of the employees, along with an accompanying letter and a post-paid return envelope. After two weeks a reminder was sent to those employees who had not yet responded. A second reminder, including an additional copy of the questionnaire, was sent out two weeks later. The questionnaires were sent to 199 employees, of which 140 responded. From these employees 94 already worked in the organization before the organizational changes were implemented. The regionalization affected all employees; the client flow only affected 73 employees. Due to 31% missing values in the cognitions concerning the effects of the regionalization on goals, 4% missing concerning the cognitions on client flow and 3% missing values in the goal ranking, we included 63 and 68 respondents in our analysis with complete data on respectively the regionalization and the client flow. The excluded

respondents did not differ from the ones that were included in the analysis with regard to educational level, gender, tenure or being a manager.

In the forensic psychiatric center the paper questionnaire was distributed among a panel consisting of a stratified random sample of employees and collected by the internal research division. Employees that were not able or willing to be part of the panel were replaced by others with similar background characteristics. We received data from 106 employees, but due to missing values especially cognitions (i.e. expected effects on goals, incomplete for 31% concerning privatization, 34% for care program) or goal rankings (15%), for both organizational changes data of only 63 employees could be analyzed. These employees did not differ on background characteristics from the employees that did deliver complete data.

In the questionnaire we asked each respondent to assess the causal effect of the organizational change on each of the goals mentioned. Respondents could indicate in a free text field whether there were elements of the organizational change that had determined their position towards it other than the effects on the goals mentioned in the questionnaire. Since there were hardly any additional elements mentioned, we conclude that the questionnaire succeeded well in capturing the relevant arguments determining the respondents' positions towards the organizational change. Moreover, this fact corroborates our confidence that positions towards the organizational changes are hardly motivated by strategic concerns (i.e., the positions of others).

In addition to eliciting a respondent's causal cognition, the survey contained questions measuring a respondent's rank ordering of the goals and his or her overall attitude toward the organizational change. In both organizations three members of upper management also completed the questionnaire.

MEASURES

Attitude Towards the Organizational change

The attitude towards each of the two proposed organizational changes was measured with Oreg´s (2006) five-item cognitive resistance subscale. The scale measures to what extent employees support or oppose the organizational

change, with each item coded from 1 (opposing the organizational change) to 5 (supporting the organizational change). Reliability was satisfactory in all cases. In the youth welfare work organization Cronbach's $\alpha = .76$ for the client flow and $\alpha = .75$ for the regionalization. In the forensic psychiatric center we found $\alpha = .75$ and $\alpha = .83$ for respectively the care program and the privatization.

Total Result

For the causal effects of organizational change m on goal $g_i(w_{m,g_i})$, we have asked in the questionnaire what effects the organizational change would have, according to the respondent, on each of the goals. Respondents could rate the expected effect on a seven-point scale, ranging from "strongly decreases" (-3) to "strongly increases" (+3) the achievement of the goal. Note that in the examples depicted in Figure 1 and 2 we used only signed relationships, while in the actual questionnaire we collected signed and weighted maps. For the goal priority s_{g_i} the list of goals was given and we asked respondents to assign the value of 100 to their most salient goal or goals. Thus, respondents were allowed to assign 100 to several goals if they considered these goals to be equally (and maximally) important. Then we asked to assign values from 0 to 100 to each of the other goals, representing how much less salient these goals were relative to the most salient goal(s). The value 0 indicates that in the opinion of the respondent the associated goal was completely unimportant.

Background Characteristics

Personal characteristics such as gender (female coded as 1) and educational level were elicited in the questionnaire. Educational level is coded in three levels; 'at most intermediate vocational education', 'higher vocational education' and 'academic degree'. Organizational characteristics, such as tenure, division and hierarchical level were provided by the organizations. In both organizations employees were distributed over four divisions, which are recoded into three dummy variables for our analyses. As a measure for hierarchical level we coded whether employees had a management job (1) or not (0).

Youth welfare work organization[a]	Regionalization (N=63) Mean	SD	Client flow (N=68) Mean	SD	1.	2.	3.	4.	5.	6.
1. Attitude	4.52	1.06	4.41	1.08		.75***	-.15	.09	.05	.40**
2. Total Result	-.10	.83	.14	.87	.63***		-.08	.05	.06	.43**
3. Gender (female)	.73	.45	.74	.44	-.26*	-.09		-.07	-.04	-.42***
4. Education	1.95	.55	2.00	.49	-.12	.21	-.05		-.19	.16
5. Tenure	12.17	7.89	12.24	7.69	.15	-.10	-.08	-.08		.23
6. Manager	.19	.40	.18	.38	.25	.14	-.43***	.19	.25*	

Forensic psychiatric center[b]	Privatization (N=63) Mean	SD	Care program (N=63) Mean	SD	1.	2.	3.	4.	5.
1. Attitude	4.25	1.46	5.32	.94		.54***	.20	-.28*	.18
2. Total Result	-.19	.84	.79	.70	.66***		.03	-.27*	.30*
3. Gender (female)	.25	.44	.24	.43	.10	-.05		-.25	.06
4. Tenure	13.75	9.48	12.81	9.75	-.35**	-.27*	-.22		-.14
5. Manager	.22	.42	.29	.46	.29*	.06	.04	-.10	

[a] Regionalization correlations are reported in the lower triangle (light grey shaded), client flow correlations are reported in the upper triangle (dark grey shaded).
[b] Privatization correlations are reported in the lower triangle (light grey shaded), care program correlations are reported in the upper triangle (dark grey shaded)
* $p < .05$; ** $p < .01$; *** $p < .001$

Table 1. Descriptive statistics and correlations.

RESULTS

Descriptive Statistics

Table 1 presents descriptive results for key variables measured respectively in the youth welfare work organization and the forensic psychiatric center. In both organizations a higher Total Result, computed according equation (1), correlated positively with attitude towards both of the organizational changes. Furthermore in the youth welfare work organization females had a less positive attitude towards the regionalization measure and managers were more positive concerning the client flow measure. In the forensic psychiatric center employees with a longer tenure have a less positive attitude towards both organizational changes, whereas managers have a more positive attitude towards the privatization.

In both organizations there were four divisions, based on the type of work. In the youth welfare organization these were the employees that worked in the 24-

hours care (35%), ambulant care (25%), day care (21%) and desk workers (19%). Being a member of the ambulant workers correlated negatively with attitude towards the client flow ($r = -.27; p = .024$). In the forensic psychiatric center the divisions were patient care (60%), treatment (16%), security (11%) and desk workers (13%). Attitude towards the privatization correlated negatively with working in patient care ($r = -.27; p = .032$).

Statistical Analysis

In order to take into account that in each organization measures of cognitive maps and attitudes towards both organizational changes are nested in respondents, we estimated multilevel models with the attitudes towards the organizational changes as dependent variables (level-one units), nested within the employees (level-two units) (Snijders & Bosker, 1999). We estimated both compound symmetry models and multivariate models. Since for the forensic psychiatric center the deviance of the multivariate model was much lower than for the compound symmetry model ($X^2_1 = 37.210; p < .001$), while for the youth welfare work organization the compound symmetry and multivariate models fitted the data almost equally well ($X^2_1 = .343; p = .56$) we only report the multivariate models in Table 2.

For both organizations, we have first estimated the empty model. In Model 1 we add demographic background characteristics (gender, education) and organizational characteristics (tenure, management level, division), since these variables have been shown to be associated with attitude towards organizational changes (e.g. Van Dam, Oreg, & Schyns, 2008; Hambrick et al., 1996). Finally we add Total Result to the model, in order to see to what extent this variable explains attitude, controlling for the background characteristics (Model 2). In Model 2 we also add an interaction effect to analyze whether the effect of Total Result on attitude differs between the two organizational changes. In the forensic psychiatric center the educational level of some employees was unknown. Since no effects were found for education, we report the models without educational level, such that more cases are included in the analyses.

Youth welfare work organization (N=131)					Forensic psychiatric center (N=126)				
	Model 1		Model 2			Model 1		Model 2	
Fixed Effect	Coef.	S.E.	Coef.	S.E.	*Fixed effect*	Coef.	S.E.	Coef.	S.E.
Mean Regionalize	5.650	.658	5.968	.481	Mean Privatize	4.856	.356	4.801	.283
Mean Client flow	5.590	.674	5.733	.491	Mean Care prog.	5.822	.336	5.161	.300
Gender	-.144	.222	-.255	.159	Gender	.273	.249	.387	.201
Tenure	.005	.012	.004	.009	Tenure	**-.027**	.012	-.014	.010
Education	-.401	.208	**-.436**	.151					
Manager	**.744**	.268	.146	.202	Manager	**.501**	.240	.346	.199
Division 24 hours	-.384	.303	-.386	.220	Division patient	-.585	.322	**-.532**	.259
Division ambulant	**-.940**	.323	**-.558**	.237	Division treatment	-.226	.391	-.138	.315
Division day care	-.401	.208	**-.729**	.233	Division security	-.046	.457	-.018	.365
TR (Total Result)			**.828**	.121	TR (Total Result)			**.999**	.145
TR x Client flow			.053	.151	TR x Care prog.			**-.395**	.185
Random Effect	Var. comp.				*Random Effect*	Var. comp.			
τ_1^2 var(Regionalize)	.972	.173	.555	.099	τ_1^2 var(Privatize)	1.600	.284	.945	.168
τ_2^2 var(Client flow)	.879	.151	.450	.077	τ_2^2 var(Care prog.)	.767	.136	.558	.099
τ_2^2 cov(Regionalize, Client flow)	.063	.127	.000	.069	τ_2^2 cov(Privatize, Care prog.)	.498	.160	.240	.104
Deviance (-2*LL*)	361.0		280.4		Deviance (-2*LL*)	359.2		311.5	
$\Delta(-2LL)$	**23.6**[b]		**80.6**[c]		$\Delta(-2LL)$	**15.0**[b]		**47.7**[c]	

[a] Unstandardized coefficients, significant effects are bold ($p < .05$).

[b] Compared to the empty model.

[c] Compared to model 1.

Table 2. Multi-level analysis for Attitude towards the organizational changes as dependent variable[a]

For both organizations Model 1, in which background characteristics are added, fits the data better than the empty model. The deviance differences are $X_7^2 = 23.548$ ($p = .001$) for the youth welfare work organization and $X_6^2 = 15.038$ ($p = .020$) for the forensic psychiatric center. The fit of Model 2, in which Total Result is added, is for both organizations significantly better than the fit of Model 1 for both the youth welfare work organization ($X_2^2 = 80.574$; $p < .001$) and the forensic psychiatric center ($X_2^2 = 40.670; p < .001$), corroborating our hypothesis.

In the youth welfare work organization managers have a more positive attitude towards the organizational changes in Model 1, but this effect disappears when Total Result is added in Model 2. In Model 2 higher educated

employees have a less positive attitude towards the organizational changes and there are differences in attitude between employees of different divisions. A very large effect, however, is associated with Total Result, with an estimated parameter of .828 (*s.e.*=.121). Both attitude and Total Result are measured on a seven-point scale. Thus if an employee's Total Result is 1 point higher, his attitude is on average .828 points higher. The interaction effect of Total Result and Client flow is non-significant and very small, meaning that the effect sizes of Total Result on attitude are almost equally large for both organizational changes. The covariance between the residual attitudes towards Regionalization and Client flow, reported in the bottom panel of Table 2, is almost zero. This implies that there is no residual correlation between a respondent's attitudes towards Regionalization and Client flow, after Total Result is added to the model. This indicates that Total Result captures the reasons underlying the attitudes towards these organizational changes very well.

In the forensic psychiatric center, in Model 1 employees with a longer tenure have less positive attitudes towards the organizational changes, while managers have more positive attitudes. These effects vanish when in Model 2 Total Result is added. In Model 2 division explains differences in attitudes, but a very large effect is again associated with Total Result. The significant effect of the interaction between Total Result and Care program indicates that the effect of Total Result on attitude was stronger for the Privatization (.999) than for the Care program (.604). With respect to both organizational changes, the effect of Total Result is significant ($t = 6.89; p < .001$ for the privatization and $t = 3.70; p < .001$ for the care program). The residual covariance between the attitudes towards Privatization and Care program is .24. Dividing by the product of the estimated standard deviations yields a residual correlation of .33, indicating that respondents who have a more positive attitude towards one organizational change are also more positive about the other organizational change, even after accounting for Total Result. Total Result is thus a less powerful predictor of attitudes in the forensic psychiatric center than it is in the youth welfare work organization.

These results strongly support our hypothesis that attitudes towards organizational changes are explained by the Total Result measure derived from

respondents' cognitive maps concerning the organizational changes, according to equation (1). Furthermore, the results suggest that attitudes towards organizational changes can be expected to change if the Total Result measure of employees changes. Changes in the Total Result measure are affected through changes in employees' cognitive maps, either in terms of changing goals priorities or of changing causal expectations. We will now present an analysis to investigate whether for the given data from our two organizations the Total Result measure would become more positive if respondents would adopt the cognition of management (i.e. they are in a cognitive conflict with management), or if they would adopt the goal priorities of management (i.e. they are in a goal conflict with management). The results of such an analysis yield valuable information for management in its attempts to reduce dissension and conflict about the proposed organizational changes.

EFFECTS OF ADOPTING MANAGEMENT'S COGNITION OR GOAL STRUCTURE ON ATTITUDE

Suppose management tries to make the attitudes of employees towards an organizational change more positive by changing the cognitive maps of employees. Management could then try to align the causal cognition of employees with their own causal cognition, for instance through rational persuasion. Alternatively, management could try to align the goal priorities of employees with their own goal priorities. As our empirical results strongly suggest, employees who have both the same causal cognition and the same goal priorities as management, will have a similar attitude towards the organizational changes as management does. However, since aligning goal priorities generally requires a different approach than does aligning causal cognitions, it is useful to analyze how much the Total Result measure, and by implication the attitudes, of employees will change if either only their causal cognitions, or only their goal priorities are aligned with management.

As a measure of the cognition of management, we use the average causal effects w_{m,g_i} of three members of upper management, in both organizations. We denote these average weights by w_{m,g_i}^{man}. Similarly, we denote the average priority

that these members from upper management assign to goal g_i by $s_{g_i}^{man}$. The average management maps are given in Figure 2. The weights assigned to the goals, representing the priorities of the goals, are given between brackets.

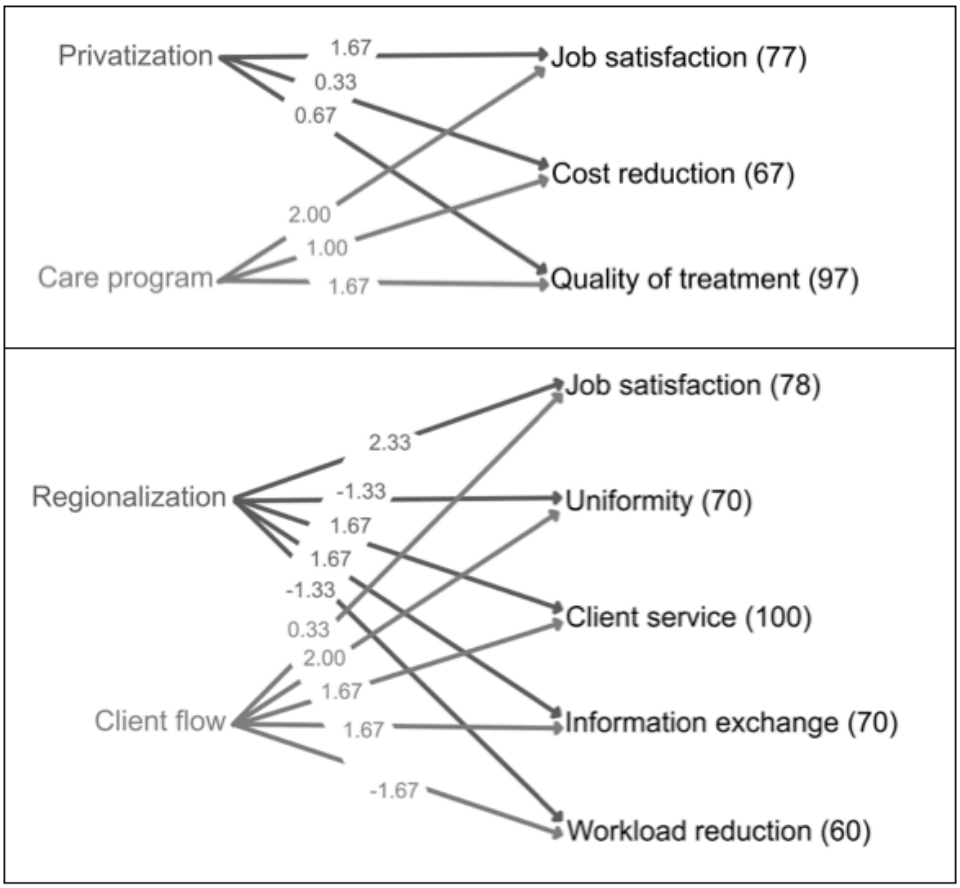

Figure 2. Average management maps in the forensic psychiatric center (upper map) and the youth welfare work organization (lower map).

To analyze the effects of the adoption of management's cognition, we calculate TR_{cog} for each employee, which is the Total Result measure of equation (1) using the cognition of management and the goals priorities of the employee. In order to emphasize the difference between the adopted cognition of management and the original goal priorities of the employees, we add the superscript *emp* to the original priorities of the employees and use the formula $TR_{cog}(m) = \left(\sum_{i=1}^{n} w_{m,g_i}^{man} \cdot s_{g_i}^{emp}\right) \Big/ \left(\sum_{i=1}^{n} s_{g_i}^{emp}\right)$. Analogously we calculate the Total Result if employees would adopt the goal priorities of management, while their causal cognitions would stay the same; $TR_{goal}(m) = \left(\sum_{i=1}^{n} w_{m,g_i}^{emp} \cdot s_{g_i}^{man}\right) \Big/ \left(\sum_{i=1}^{n} s_{g_i}^{man}\right)$.

Finally we calculate the changes in Total Result resulting from the adoption of respectively the causal cognition of management or the goal priorities of management, so $\Delta TR_{cog} = TR_{cog} - TR$ and $\Delta TR_{goal} = TR_{goal} - TR$.

In Table 3 the average changes in Total Result of employees after adopting either the causal cognition or the goal priorities of management are given. In the youth welfare work organization the average change in Total Result is almost nil for both reorganizations if the employees adopt the goal priorities of management. If, on the other hand, employees adopt the causal cognition of management their Total Result will increase on average with .90 concerning the Regionalization and .79 concerning the Client flow. Since the estimated effect of Total Result on attitudes towards these organizational changes was .83 (see Table 2), this would mean that if management is able to convince the employees of its causal cognition, the attitudes of the employees would become about .75 and .66 more positive for respectively the regionalization and the client flow measures, on a 7-point scale. A good strategy for upper management in this organization would be to convince their employees of the causal effects the organizational changes will have on the goals. Focusing on which goals are important to reach, will not contribute to more positive attitudes of employees. Thus, the conflict between employees and management concerning the desirability of the proposed organizational changes is mainly of the cognitive type.

	Youth welfare work organization				Forensic psychiatric center			
	Regionalization		Client flow		Privatization		Care program	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ΔTR_{cog}	.90	.80	.79	.85	1.20	.88	.86	.70
ΔTR_{goal}	.01	.14	.00	.16	.84	.81	.17	.64

Table 3. Change in Total Results if either cognition or goal priorities are adopted from management.

In the forensic psychiatric center the attitudes of employees towards both organizational changes will become more positive both if they adopt the goal structure of management and if they adopt the causal cognition of management. However, the effect of adopting the causal cognition on Total Result is much

larger than the effect of adopting the goal structure. Hence, also in the forensic psychiatric center convincing the employees which causal consequences the organizational changes have on the goals will be more effective in improving the attitudes towards the organizational changes, than will be emphasizing which goals are especially important to reach. Therefore, although the conflict in the forensic psychiatric center has both cognitive and goal related elements, addressing the former seems a more promising avenue for conflict resolution than is addressing the latter.

DISCUSSION

In this paper we have offered a clarification of the distinction between goal conflicts and cognitive conflicts using the cognitive mapping approach. We have argued that the cognitive mapping approach we employ is a natural way to measure cognitive conflict concerning the consequences of specific organizational changes. For a successful implementation of organizational changes the cognitions of organizational members need to be aligned (Bartunek, 1984; Isabella, 1990). Since our measure of Total Result derived from the cognitive maps, including goal priorities, correlates strongly with attitude towards organizational changes on data obtained from two Dutch organizations, these maps can offer insights in which part of the cognitions are not aligned. The cognitive maps used in this study are simple, in the sense that they only include the direct effect of a new organizational change on end goals, which is detailed enough to identify whether a conflict is a rooted in divergent cognitions or divergent goal priorities. If however the conflict appears to be rooted in different cognitions, analyses of more detailed cognitive maps, including the effects on sub goals and subsequently capturing the reasoning underneath the expected effect from an organizational change on a certain goal, could be used to find out which cognitive differences among the employees contribute most to the cognitive conflict (Septer et al., 2012).

Conflicts that are mainly the result of divergent cognitions concerning the effects of an organizational change on goals require different resolution strategies than do conflicts rooted in divergent goal priorities. Moreover, taking

the perspective of management, turning the wrong button (e.g., trying to align goals while aligning cognitions would actually be more effective in decreasing conflict) could even increase the severity of conflict. Based on our Total Result measure and its empirically demonstrated relation to attitudes, we have therefore introduced a method to determine to what extent the alignment of either employees' cognitions or goal priorities with the cognitions and goal priorities of management, will contribute to more positive attitudes of employees. This method was illustrated using the same data obtained from the two Dutch organizations. In both organizations, the conflict over the desirability of the organizational changes turned out to have a big cognitive component. Only in the forensic psychiatric center also goal conflict occurred.

Future Research

An area for future research would be to assess the implications of the two types of conflict for the effectiveness of different conflict resolution strategies. For example, rational persuasion is arguably more effective in cognitive conflicts, whereas enforcement or logrolling strategies could be more effective in goal conflicts. This prediction is based on the intuition that one might be able to convince others that their causal cognition is mistaken, but it will be far more difficult to convince them that they have the "wrong" goal priorities. As Tjosvold (1985) argued, open-minded discussion about a *controversy* (which is very close to our concept of a cognitive conflict) can result in a decision that is more effective for all, while in goal conflicts bargaining and negotiating often lead to compromises that are only partially satisfying for the individuals involved. Along the same lines scholars have argued that, contrary to goal conflict, a certain level of cognitive conflict can be beneficial if it is managed properly, because it prevents the negative effects of groupthink (Janis, 1982). Both Tjosvold and Janis's points require a precise analytic distinction between cognitive conflict and goal conflict, as presented in our paper. For studies on these topics data are required that measure cognition and goal priorities at more moments in time and data concerning persuasion techniques or information exchange should be collected.

We have illustrated our method to distinct goal conflict or cognitive conflict over a new organizational change with data concerning the cognition of management and employees in organizations. The same analyses might proof useful in political research. Insight in whether conflicts concerning new policies between voters and politicians are rooted in different cognitions or different goal priorities is relevant for the campaigning technique.

The finding in our data that in both organizations there was mainly a cognitive conflict rather than a goal conflict is relevant for research on resistance to change. It suggests that resistance to organizational changes might be resolved best through open discussion about the expected positive and negative consequences of the organizational changes. Through rational persuasion management might be able to convince the employees of the positive effects the organizational changes will have on the achievement of the goals. However, open-minded discussion might also change the mind of management and stop them from implementing the organizational changes. Scholars studying resistance to new organizational changes have been criticized for their implicit assumption that change agents (i.e., management) have the "right" cognition, and that individuals who resist are troublemakers (Dent & Goldberg, 1999; Nord & Jermier, 1994). Organizational changes frequently bring about consequences that were not intended by the decision makers (Sato, 2006; Balogun & Johnson, 2005) and therefore management should not neglect deviant cognitions. Management's cognition might be the result of wishful thinking or groupthink, and the employees might be "right". Crucial to the resolution of such issues is again a clear analytic distinction between cognitive conflict and goal conflict, such as we have proposed in this paper.

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III. DETECTING AND MEASURING CRUCIAL COGNITIVE DIFFERENCES*

WHICH LINKS IN COGNITIVE MAPS CONTRIBUTE MOST TO CONFLICT?

ABSTRACT

The reasoning underlying the attitude of stakeholders towards the implementation of a means can be captured in causal cognitive maps about the effects of the means on relevant goals. For acyclic cognitive maps with weighted directed signed links we propose quantitative measures for the weight of the paths between means and goals and a measure for the total result of the means on all goals. In data about the cognitive maps of 94 employees about their perceived consequences of a merger, the latter measure correlates strongly with their attitude towards the merger. Finally we propose a method to detect about which links in the map the cognitive differences between individuals contribute most to their differences in attitudes towards the means, in the sense that agreement on these links would decrease the variance in the attitudes most.

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INTRODUCTION

In January 2006 two Dutch inspection agencies merged into one national authority concerning the inspection of food and commodities. The contents of the inspections by each of the former organizations differed, but they visited to a large extent the same companies. The merger was intended to increase productivity, by combining the inspections of both former organizations into one visit, and by combining their best practices. This merger fits into the ambition of the Dutch government to reduce the size of the civil service. Among employees were both supporters and opponents of the merger. Employees had constructed their own theories about the cause-effect relations concerning the merger (cf. Weick, 1979; Sims and Gioia, 1986). For instance, not all employees shared the view of management that productivity and quality levels would increase due to the merger.

Quite some conflicts concerning policy changes are rooted in differences in the cause-effect reasoning of individuals, i.e., in different cognitions about the extent to which a policy change will have a positive or negative effect on the realization of the goals (Hammond et al, 1966; McGrath, 1984; Tjosvold, 1985; Tjosvold, 2008). In order to change peoples' overall attitudes towards policy changes, these cognitions should be changed (Bartunek, 1984). In our study in the food inspection agency we have collected data concerning the attitudes of employees towards the merger, as well as their underlying causal theories. We have captured these causal theories concerning the consequences of the merger in so-called cognitive maps.

A cognitive map is a directed network with nodes representing concepts and links between those nodes representing whether a change in one concept (the cause) will result in a change in another concept (the effect), according to a certain individual. Since we are interested in the cognition concerning the causal consequences of a policy change on a set of end goals, the maps we consider have a means-ends structure (Montibeller and Belton, 2006). In our study the means is the merger. The other nodes in the maps are sub goals and end goals. The extent to which these goals are reached cannot be changed directly, but only via changes in the means. An example of a cognitive map of an employee concerning the consequences of the merger is given in Figure 1.

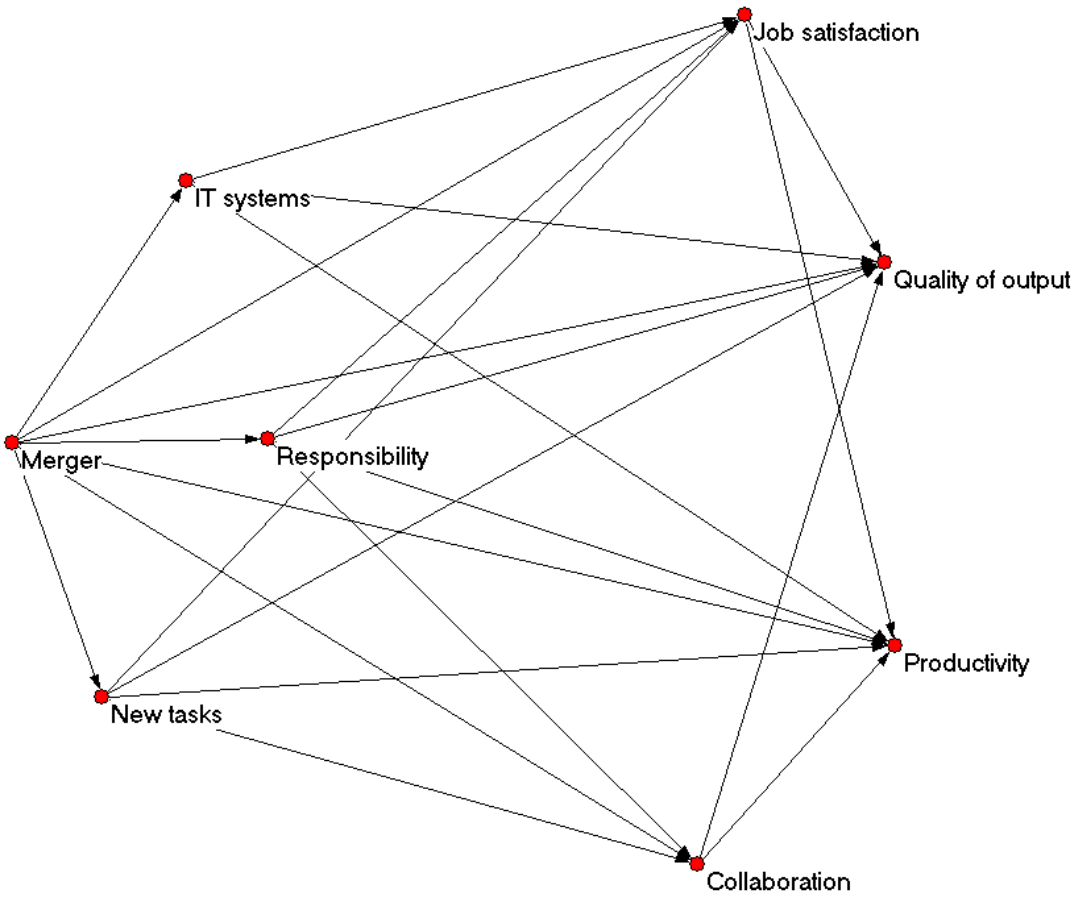


Figure 1: Cognitive map capturing the cognition about consequences of a merger.

If according to the employee two of these variables are causally related, an arrow is drawn between the corresponding nodes. For instance the arrow from *responsibility* to *productivity* in Figure 1, indicates that according to the employee a change in the level of his responsibility will result in a change in productivity. More information about the links will be added later by assigning signs and strengths to the arrows.

We will present a mathematical measure to calculate an individuals' attitude towards the means based on their cognitive maps. With attitude towards a means we mean the extent to which individuals support or oppose the implementation of the means. In our data, our measure indeed correlates highly with the attitude of employees towards the merger. Subsequently we introduce an algorithm to detect those cognitive differences *between individuals* that contribute most to the variance in their attitudes towards the means. Thus the

central question in this paper is how to compare causal cognitive maps, such that those cognitive differences in a group can be detected, that add greatly to divergent attitudes, i.e. the level of support or opposition towards implementation of the means.

Several measures have been proposed to compare maps between individuals. Eden et al (1992) argue that there is no general approach to analyze maps. The relevance of using certain measures to compare maps, depends on the research question and on the type of data in the cognitive map. They propose several measures to compare maps, such as a measure for cognitive complexity and measures to compare the structures of maps. Complexity measures are based on the number of nodes and links in the maps; individuals that perceive more links have a more complex cognition. The measures for structure focus on the level of linkage, so whether the nodes in the maps are highly interconnected or whether there are clusters in the maps that are disconnected from other clusters. Another type of analyses for cognitive maps is to focus on the nodes that are central in a map, namely those nodes with a large number of incoming or outgoing links (Eden et al 1992, Eden 2004). Other scholars compare the maps of individuals by using a distance ratio (Langfield-Smith and Wirth, 1992; Markóczy and Goldberg, 1995). Maps of two individuals are then compared by summing up the differences between the maps. Although all these measure give insight in the extent to which the maps of several individuals are aligned, they do not relate the maps of individuals to their attitudes.

We argue that the attitude of individuals towards a means will be related to the consequences they expect from that means. Since cognitive maps capture the reasoning concerning these consequences of the means, these maps must be a good indicator for the attitude of the individual towards the means. However, individuals that differ to a large extent in cognitive complexity can still have the same attitude towards the means. An individual with a more complex cognition will perceive more pros and cons than an individual with less cognitive complexity, but after balancing their pros and cons they might end up with the same attitude. However, these individuals would be very distinct based on the distance ratio (Langfield-Smith and Wirth, 1992; Markóczy and Goldberg, 1995) and the measures of complexity and structure (Eden et al 1992, Eden 2004). And

on the other hand, if individuals only differ in cognition on the strength and the sign of one certain link and that link is very central in their maps, their attitudes towards the means might be very different. This is so, because a central link is part of several reasonings concerning the effect from the means on the goals. Yet, in the latter case the individuals' cognitions would be rather similar according to the distance ratio (Langfield-Smith and Wirth, 1992; Markóczy and Goldberg, 1995) and the measures of complexity and structure (Eden et al 1992, Eden 2004).

Consequently these measures cannot detect which inter-individual cognitive differences should be aligned in order to reach consensus concerning the implementation of the means. However, such information is extremely relevant in situations in which implementation of the means will have impact on a large group of individuals. Even if the affected individuals lack formal power in the decision making process, their support of the means is frequently necessary since they could obstruct successful implementation. The method we propose will detect those cognitive differences that contribute most to divergent attitudes towards the means under consideration. Some scholars (Anthony et al., 1994) have analyzed strategic manipulation of information in political debate, using cognitive maps based on what was said and emphasized in debates. We use maps that capture the actual cognition of stakeholders and deduce what to bring up in a debate, in order to reduce conflict.

In the next section we will introduce a measure to infer the attitudes of the employees from their cognitive maps. In our data this measure correlates highly with the actual attitudes towards the merger. Subsequently we propose an algorithm to detect those links in the cognitive maps on which divergent views of the employees contribute most to the differences in attitudes towards the merger. Then we will sketch the background of the merger of the food inspection services and describe how the cognitive map data were collected. Our measures and the method to detect links on which reaching consensus is most relevant in order to decrease variance in attitudes, are illustrated on the data. We end with a discussion.

MODELLING THE COGNITIVE MAPS AND PREDICTING ATTITUDE

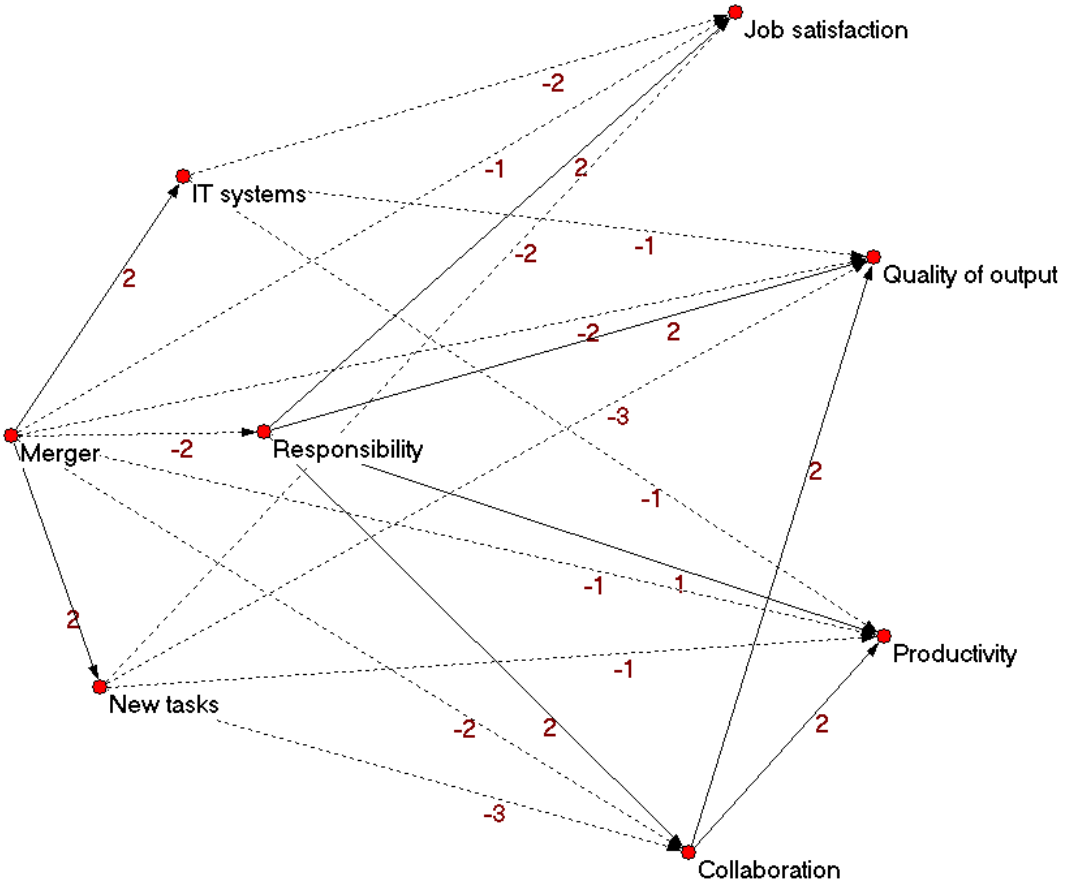
Technically, a cognitive map is a directed weighted graph $\mathbf{G}=(\mathbf{N},\mathbf{W})$ where **N** is the set of nodes v_i $(i=1,\ldots,n)$ and **W** the set of weights w_{ij} assigned to the link from node v_i to node v_j. In graph theory one often uses the term vertex instead of node and the terms arrow, arc or directed edge instead of link. In line with the literature on cognitive maps, we will use the terms links and nodes. The links have a weight and a sign and have maximum strength β ($w_{ij}\in[-\beta,\beta]$). A weight of zero means that there is no perceived causal relation between the nodes. In general we denote nodes by v_i. Since the means and goals are nodes of special interest, we sometimes denote them by respectively *m* and g_i ($i=1,...,n_g$; with n_g being the number of goals).

A cognitive map can be represented by an $n\times n$ valency matrix *W*, with entries $W_{ij}=w_{ij}$ (Harary et al, 1965; Axelrod, 1976). In Figure 2 a weighted cognitive map of one employee is given, together with the corresponding valency matrix.

A path is a sequence of nodes such that from each of its nodes there is a link to the next node in the sequence. By raising the matrix *W* to the power *l*, paths of length *l* can be detected. If $W^l{}_{ij}\neq 0$ a path from v_i to v_j exists of length *l* (Harary et al, 1965; Axelrod, 1976). The number of paths from node v_i to v_j is $n_{P_{ij}}$. These paths are denoted by $P_{ij}^{[q]}=\{v_iv_1,v_1v_2,\ldots,v_{l_q-2}v_{l_q-1},v_{l_q-1}v_j\}$, with $v_k\in N$, $0\leq q\leq n_{P_{ij}}$ and l_q being the length of the specific path, i.e., the number of links in the path.

In our analysis the determination of the weight of a path, based on the weights of the links in that path, is crucial. Since if we are able to calculate the weight of a path from the weights of the links in the path, we can calculate what a change in the weight of one single link in the path, would do to the weight of that whole path. Montibeller and Belton (2006) proposed measures to calculate the weight of a path from the weights of the links in that path. We adopt their terminology of partial effects *PE* and total effects *TE*, but we will propose different ways to calculate them.

The weight of the path $P_{ij}^{[q]}$ is referred to as the partial effect $PE\left(P_{ij}^{[q]}\right)$ from v_i on v_j (Montibeller and Belton, 2006). $TE\left(P_{ij}\right)$ denotes the weight of the total effect from v_i to v_j of these $n_{P_{ij}}$ paths taken together. We will introduce measures for $PE\left(P_{ij}^{[q]}\right)$ and $TE\left(P_{ij}\right)$, that fulfill some desirable criteria.



W=

	1.	2.	3.	4.	5.	6.	7.	8.
1. Merger	0	**2**	**2**	**-2**	**-1**	**-2**	**-1**	**-2**
2. IT systems	0	0	0	0	**-2**	0	**-1**	**-1**
3. New tasks	0	0	0	0	**-2**	**-3**	**-1**	**-3**
4. Responsibility	0	0	0	0	**2**	**2**	**1**	**2**
5. Job satisfaction	0	0	0	0	0	0	**0**	**0**
6. Collaboration	0	0	0	0	0	0	**2**	**2**
7. Productivity	0	0	0	0	0	0	0	0
8. Quality of output	0	0	0	0	0	0	0	0

Figure 2: Weighted cognitive map of sample employee with corresponding valency matrix, based on the questionnaire. Dotted arcs represent links with negative weights.

Criteria for measures of path strength

We expect that the attitude of individuals towards a means, hence the extent to which individuals support or oppose the implementation of it, will be correlated with the total effect they expect from the means. Therefore, we want a mathematical measure that assigns a single number to a cognitive map, capturing the extent to which the individual expects positive or negative effects of the means. As a first step we need a measure that assigns a weight to a path consisting of several links, i.e., a measure for the partial effect $PE\left(P_{ij}^{[q]}\right)$. We formulate three desirable criteria for this measure.

Criterion 1, sign of PE: Concerning the sign of a *PE* there is consensus that paths with an odd number of negative links have a negative sign and paths with an even number of negative links have a positive sign (Axelrod, 1976; Montibeller and Belton, 2006).

$$\operatorname{sgn}\left(PE\left(P_{ij}^{[q]}\right)\right)=\operatorname{sgn}\left(\prod_{kl\in P_{ij}^{q}} w_{kl}\right) \qquad (1)$$

Criterion 2, range of strengths of PE: The strength of the causal effect between two nodes should not depend on the number of sub steps in the causal reasoning. A causal reasoning consisting of one link could be equally strong as a more complex causal reasoning, consisting of several links. In other words, the range of possible partial effects should be independent of path length.

$$PE\left(P_{ij}^{[q]}\right)\in\left[-\beta,\beta\right]\ \forall l_q \qquad (2)$$

Criterion 3, strength of PE: The weight of all links in a path should contribute to the strength of the partial effect. Two paths that differ only in the weight assigned to one particular link should differ in strength. Some scholars (Kosko, 1986; Montibeller and Belton, 2006) consider the weighted links in cognitive maps as ordinal and proposed that *PE* is the minimum of the weights in a path. A disadvantage of this measure is that the most extreme values are crucial. Both the path $v_1 \overset{\text{strong (3)}}{\rightarrow} v_2 \overset{\text{weak (1)}}{\rightarrow} v_3 \overset{\text{moderate (2)}}{\rightarrow} v_4$ and $v_1 \overset{\text{weak (1)}}{\rightarrow} v_2 \overset{\text{weak (1)}}{\rightarrow} v_3 \overset{\text{weak (1)}}{\rightarrow} v_4$ would have a partial effect of *weak* (1). We consider the weights in the cognitive maps not as just ordinal, but as measured on a ratio level (cf. Roberts, 1976; Langfield-Smith

and Wirth, 1992; Markóczy and Goldberg, 1995). In our measure for the strength of the partial effect of the two paths given above, the first path should have a stronger *PE* than the second.

There is no unique measure for the partial effect that fulfills criteria 1 to 3. Both measures based on addition of weights of links and measures based on multiplication, could fulfill these criteria. Measures for partial effect that are based on addition are suitable if the effect from node *i* to *j* represents some distance between *i* and *j*. Since in the causal cognitive maps the weights of a path indicate some kind of intensity, rather than a distance, a multiplicative measure seems more natural. A measure for the partial effect that fulfills criteria 1 to 3 is the multiplication of the weights in a path, normalizing for the path length:

$$PE\left(P_{ij}^{[q]}\right)=\frac{1}{\beta^{l_q-1}}\prod_{kl\in P_{ij}^{q}} w_{kl} \qquad (3)$$

Such a multiplicative measure has also been proposed by Roberts (1976), without normalizing for path length, however. Since the maximum weight of a path of length l is β^l we divide the measure through β^{l-1} in order to fulfill criterion 2. As a result the strength of longer paths is in the same range of values as the strength of shorter paths. Furthermore, the measure fulfills criterion 1, simply because the multiplication of an odd number of negative numbers, results in a negative number. And if the weight of only one link in the path is changed, the partial effect will also change through multiplication of the weights, except if one link has weight zero, but then no path exists. Hence, the measure fulfills criterion 3 a well. For example, the path $v_1 \overset{-3}{\rightarrow} v_2 \overset{+1}{\rightarrow} v_3 \overset{+2}{\rightarrow} v_4$ would have a partial effect of $PE=\frac{1}{3^2}\left(-3\cdot 1\cdot 2\right)=\frac{-2}{3}$ and $v_1 \overset{+1}{\rightarrow} v_2 \overset{+1}{\rightarrow} v_3 \overset{+1}{\rightarrow} v_4$ a partial effect of $PE=\frac{1}{3^2}\left(1\cdot 1\cdot 1\right)=\frac{1}{9}$, according to formula (3).

Based on the partial effects we want a measure for the strength of the total effect *TE* of the means on a goal. We will formulate two desirable criteria for the strength of the total effect.

Criterion 4, range of TE: The strength of the total effect of the means on a goal should not depend on the number of partial effects from the means on the goals. Therefore $TE(P_{ij}) \in [-\beta, \beta]$.

Criterion 5, strength of TE: The partial effects *PE* of each path from a means to a goal should contribute to the strength of the total effect *TE*. If one individual perceives one partial effect on a goal as stronger than another individual, while their cognitive maps are otherwise identical, the former individual should perceive a stronger total effect *TE* than the latter. This criterion excludes the measure for the total effect of Montibeller and Belton (2006), who proposed to distinguish between the total negative and the total positive effect, the total negative effect being the largest negative partial effect and the total positive effect being the largest positive partial effect. A disadvantage of that measure is that the most extreme values are crucial. If there would be several paths with a moderate positive partial effect and only one path with a strong negative partial effect, the *TE* would be (-*strong, moderate*), suggesting the negative paths are stronger. However, if the number of positive paths were taken into account, this might be unrealistic.

A measure for the total effect *TE* meeting criteria 4 and 5 is the average over all possible partial effects. Let $n_{P_{ij}}$ denote the number of all *possible* partial effects from v_i to v_j. Then the total effect is;

$$TE(P_{ij}) = \frac{1}{n_{P_{ij}}} \sum_{q=1}^{n_q} PE(P_{ij}^{[q]}) \qquad (4)$$

We emphasize that we analyze maps for which the set of links is the same for all individuals. Let A be the samples' adjacency matrix with $A_{ij} = 1$ if the individuals are asked to assign a weight to the link from v_i to v_j and $A_{ij} = 0$ if the link is not evaluated. For example, in the data of the merger we have asked each employee to ascribe a weight to each of the 22 links drawn in Figure 1. Therefore the adjacency matrix contained 22 1-entries. The reachability matrix $R = \sum_{t=2}^{n-1} A^t$ is the matrix indicating the total number of possible indirect paths

between each pair of nodes, i.e., the total number of indirect paths from v_i to v_j is $n_{P_{ij}} = R_{ij}$. Note that we sum up the powers of the adjacency matrices starting with A^2. Since we are interested in the number of indirect effects between two nodes we have excluded the direct effects given in matrix *A*.

It might be that according to a certain individual a path does not exist (i.e., is assigned a weight of 0). However, in the calculation of the total effect of this individual the average is taken over all possible indirect paths. The total effects in (4) are elements from the matrix in which the partial effects are summed up, divided by the elements from the reachability matrix. Hence formula (4) can also be written as:

$$TE(P_{ij}) = \frac{\left[\sum_{t=2}^{n-1} \frac{W^t}{\beta^{t-1}}\right]_{ij}}{R_{ij}} = \frac{\left[\sum_{t=2}^{n-1} \frac{W^t}{\beta^{t-1}}\right]_{ij}}{\left[\sum_{t=2}^{n-1} A^t\right]_{ij}} \qquad (5)$$

To illustrate our measures, we will calculate some partial effects *PE* and total effects *TE* in the map from Figure 2. In this map there are six indirect paths from the *merger* to the goal *productivity*. Four of these paths consist of two links, namely the paths via *IT systems*, *responsibility*, *new tasks* and *collaboration*. Since several paths from *merger* to *productivity* are possible, we had introduced *q* to denote which path we refer to. It is arbitrary which path number we assign to these paths and therefore we are free to refer to these paths as respectively path 1 to path 4. This means that ($P^{[1]}_{Merger,\mathrm{Pr}oductivity}$) refers to the path *merger* → *IT systems* → *productivity*. In Figure 2 there are two paths consisting of three links, namely the path *merger* → *new tasks* → *collaboration* → *productivity* ($P^{[5]}_{Merger,\mathrm{Pr}oductivity}$) and the path *merger* → *responsibility* → *collaboration* → *productivity* ($P^{[6]}_{Merger,\mathrm{Pr}oductivity}$).

We will calculate the partial effect for those six paths using formula (3), with the maximum weight that can be assigned to a link being $\beta = 3$. The partial effect from *merger* → *IT systems* → *productivity* of the employee in Figure 2 is then $PE(P^{[1]}_{Merger,\mathrm{Pr}oductivity}) = \frac{2 \cdot -1}{3} = \frac{-2}{3}$ and for the other twopaths we find

$PE(P^{[2]}_{Merger,\Pr oductivity}) = \frac{-2 \cdot 1}{3} = \frac{-2}{3}$, $PE(P^{[3]}_{Merger,\Pr oductivity}) = \frac{2 \cdot -1}{3} = \frac{-2}{3}$ and $PE(P^{[4]}_{Merger,\Pr oductivity}) = \frac{-2 \cdot 2}{3} = \frac{-4}{3}$. For the partial effects of the threepaths we divide by $\beta^2 = 9$. Thus the partial effect of *merger* → *responsibility* → *collaboration* → *productivity* is $PE(P^{[5]}_{Merger,\Pr oductivity}) = \frac{-2 \cdot 2 \cdot 2}{3^2} = \frac{-8}{9}$ and *merger* → *new tasks* → *collaboration* → *productivity* it is $PE(P^{[6]}_{Merger,\Pr oductivity}) = \frac{2 \cdot -3 \cdot 2}{3^2} = \frac{-4}{3}$.

As can be seen in Figure 1, the possible number of paths from *merger* to *productivity* is ten, but since the individual whose map is depicted in Figure 2, assigned a weight of zero from *job satisfaction* to *productivity*, four of these ten possible paths do not exist in his perception. Hence the paths $(P^{[7]}_{Merger,\Pr oductivity})$ to $(P^{[10]}_{Merger,\Pr oductivity})$ are the paths via *job satisfaction* and all have a partial effect of zero.

The total effect from the *merger* to *productivity* can be calculated by formula (4) or (5): $TE(P_{Merger,\Pr oductivity}) = \frac{\frac{-2}{3} + \frac{-2}{3} + \frac{-2}{3} + \frac{-4}{3} + \frac{-8}{9} + \frac{-4}{3} + 0 + 0 + 0 + 0}{10} = \frac{-5}{9}$. For the direct effect from *merger* to *productivity* the employee in Figure 2 could choose an integer between -3 and 3 and he had chosen -1, which is in line with the total effect that we have calculated.

Using formula (3) and (4) the total effects from the *merger* to the three other goals in the cognitive map from Figure 2 are $TE(P_{Merger,Job\ satisfaction}) = \frac{-4}{3}$, $TE(P_{Merger,Collaboration}) = \frac{-5}{3}$ and $TE(P_{Merger,Quality\ of\ output}) = \frac{-34}{45}$.

Measure for the total result TR perceived by individuals

In order to relate the maps of the employees to their attitudes towards the means, we want to combine the total effects on the goals into one measure, which we will call the total result *TR*. The total result is a measure for how satisfied the employee is with all the consequences (s)he expects from the merger, taken together. We define the total result $TR(m)$ that an employee

assigns to the means *m* as a weighted average of the total effects (s)he expects from *m* on the goals. The weights s_{g_i} indicate the relative importance of goal g_i to the employee. The total result *TR* of means *m* is:

$$TR(m) = \frac{\sum_{i=1}^{n_g} s_{g_i} \cdot TE\left(P_{m,g_i}\right)}{\sum_{i=1}^{n_g} s_{g_i}} \qquad (6)$$

The total result of the employee in Figure 2 can be calculated with this formula. Since in these data we have no measure for goal salience, we assume that all goals are equally important to each employee and set all saliences equal to 1. The total result is then $TR(Merger) = \frac{1 \cdot \frac{-5}{9} + 1 \cdot \frac{-4}{3} + 1 \cdot \frac{-5}{3} + 1 \cdot \frac{-34}{45}}{4} = -1\frac{7}{90} \approx -1.08$.

METHOD FOR DETECTING LINKS ON WHICH AGREEMENT IS CRUCIAL

We expect that the attitudes towards the means, i.e., the extent to which individuals support or oppose it, are grounded in the causal consequences they expect. As we will show later in the result section, in the data concerning the merger our measure for the total result *TR* indeed correlates highly with attitude. Thus divergent attitudes towards the means in a group are the result of divergent cognitions. Cognitions could be more aligned through debate and of course if consensus is reached in the group concerning the weights of each link, i.e., if the maps become identical, the attitudes towards the means will be similar. However, discussing each link is time consuming. It is relevant to detect one link, or a small set of links, on which reaching agreement contributes largely to more similar attitudes towards the means.

As a next step we want to identify those causal links on which divergent causal estimates among the employees contribute most to the diversity in attitudes. If the group wants to align their attitudes, these are the links about which consensus is crucial. Intuitively, one could argue that the link with the highest variance is the most crucial link. However, since a single link can be part of multiple paths, it could be that consensus on another link would reduce the divergence in attitudes more.

As a measure for the divergence in attitudes we use the variance in total result, thus the sum of the squared deviations of the mean, from all individuals in our sample. Consider a sample of n individuals in which the total result of individual α is denoted by $TR^{[\alpha]}$. Then this variance is:

$$\sigma^2(TR) = \frac{1}{n}\sum_{\alpha=1}^{n}\left(TR^{[\alpha]} - \frac{1}{n}\sum_{k=1}^{n} TR^{[k]} \right)^2 \qquad (7)$$

The weights assigned from v_i to v_j in a map of individual α are denoted by $w_{ij}^{[\alpha]}$. We assume that if agreement would be reached within the sample concerning the weight of the link from v_i to v_j, this agreement will be the mean weight of the sample on that link. We denote the sample average of the weights of the link from v_i to v_j by $\overline{w_{ij}}$:

$$\overline{w_{ij}} = \frac{1}{n}\sum_{\alpha=1}^{n} w_{ij}^{[\alpha]} \qquad (8)$$

We denote the variance in total result *TR*, given that all individuals agree that the weight from node v_i to v_j is equal to the sample mean $\overline{w_{ij}}$, by $\sigma^2\left(TR \mid w_{ij}^{[\alpha]} = \overline{w_{ij}}\right)$. The latter value indicates what the variance would be if the sample would agree on the link from v_i to v_j, while on all other links the individuals keep their initial link weight. The link on which agreement would result in the smallest variance in *TR* is called the *most crucial link* on which agreement should be reached. Consensus on the causal effect of this link maximally decreases the level of conflict concerning the total result *TR* of the means.

However, consensus on several links simultaneously might be considered, in order to align attitudes. Let $\overline{S} \subset W$ denote a subset of links on which we define the sample to agree, then $w_{ij}^{[\alpha]} = \overline{w_{ij}}$ if $\{ij\} \in \overline{S}$. Then $\sigma^2\left(TR \mid \overline{S}\right)$ is the variance in the total result if everyone agrees on the links within $\overline{S}$. Let $\overline{S_x}$ denote a set with exactly *x* links. For each *x* we can compute the set of links on which the variance in *TR* will reduce most by:

$$\min_{\overline{S_x} \in W}\left(\sigma^2\left(TR \mid \overline{S_x}\right)\right) \qquad (9)$$

For example, if the individuals want to align their attitudes by discussing three causal links, they could solve the minimization problem (9) for $x=3$.

COLLECTING COGNITIVE MAP DATA

We have collected cognitive map data about the consequences of the merger between two inspection agencies among employees working in one region of the Netherlands. The data were collected in 2007, a year after the merger had taken place. We have collected the data among all employees by means of a questionnaire (Hart, 1976). In this questionnaire we have asked respondents to indicate the weight of links in a nomothetic map. This means that we had already selected nodes and links concerning the consequences of the merger, and respondents were restricted to give their cognition on these links. The selection of these nodes and links was based on interviews with ten employees, held about a month prior to the mailing of the questionnaire. Before the questionnaire was sent to all employees as a web survey, it was piloted among seven employees.

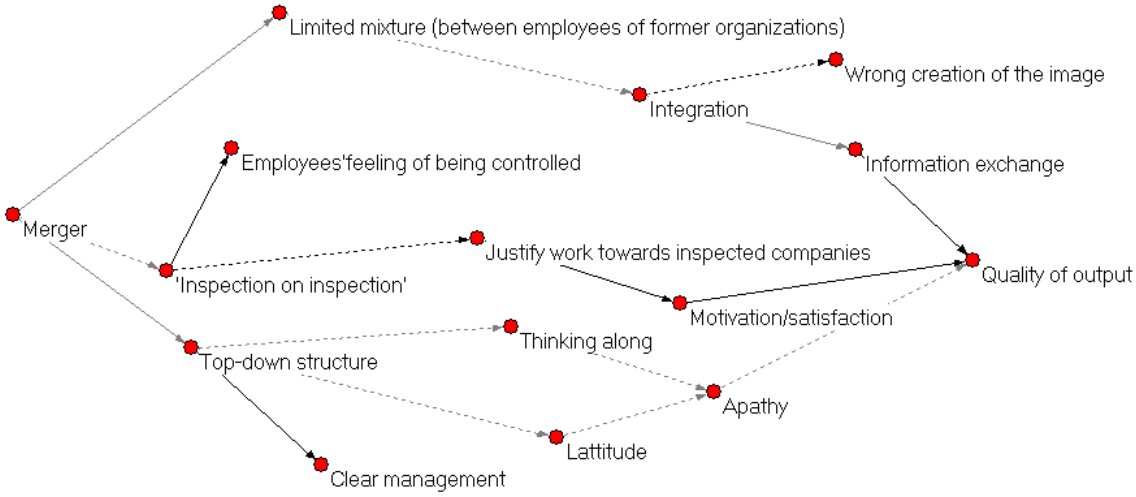


Figure 3: Cognitive map drawn by one of the interviewees. Dotted arcs represent negative causal relations.

We have interviewed ten employees from different departments and hierarchical functions. We asked what, according to them, the main consequences of the merger were, both intended and unintended. We also asked

to identify consequences that they thought others might expect to arise from the merger. The interviews were audio-recorded and took one and a half to two hours each. In six of the ten interviews we let the interviewees draw a map explicitly on a large piece of paper. First we let them write down the concepts, i.e. the nodes, and let them draw links between the concepts. We had asked them to speak out loudly which concepts were linked and why. When they were finished we asked them whether the links were equally strong, and if not, if they could draw thicker arcs for the links that were stronger. The map of one interviewee is given in Figure 3. In the other four interviews there was no time to let the interviewees draw the maps, but we did ask them what the goals of the merger were and we asked them to argue whether the merger positively or negatively would contribute to realizing those goals.

Some concepts that were phrased differently in different interviews seemed to be similar. In certain interviews it was indicated that as a consequence of the merger, the level of responsibility was decreased, while others stated that the level of control was increased. We have checked whether these arguments were two sides of the same coin, and they were. Similarly, some interviewees used the word quantity of output, which appeared to be the same as *productivity*. There were seven consequences of the merger that were mentioned in at least five of the ten interviews, namely new *IT systems*, *new tasks*, *responsibility*, *job satisfaction*, *quality of output*, *collaboration* (between employees of the former organizations) and *productivity*. All other concepts were mentioned by at most two interviewees, and were not included in the questionnaire.

The causal links that were strong according to some interviewees were perceived to exist by all or most of the other interviewees. Those links were selected for the questionnaire. The other links, that were excluded, were mentioned in only one interview and were indicated weak. We ended up with the eight nodes and 22 links drawn in Figure 1. Of these eight nodes the *merger* is the means. Four concepts were indicated as goals by at least five interviewees, namely *productivity*, *quality of output*, *collaboration* and *job satisfaction*. No other concept was mentioned as a goal. Although the merger was not primarily implemented in order to change job satisfaction, interviewees expected the

merger to have an impact on it and mentioned that management used increasing job satisfaction as an argument to defend the merger.

Figure 1 shows that the maps contain three sub goals, namely *new tasks*, *IT systems* and *responsibility*. From both former organizations some *IT systems* were selected, which meant that employees had to work with at least some new IT facilities. Since the responsibility of employees differed between the two former organizations, they expected this responsibility would change.

The 22 links that we selected contain no cycles. This means that there are no feedback loops in the causal reasoning of the individuals, such as 'an increase in concept A increases concept B and increasing B increases A'. The measures we propose to derive an individual's attitude from his cognitive map, only works in acyclic maps, since the ultimate strength of a cycle is undetermined. In practice individuals hardly indicate cycles in their cognitive maps (Axelrod, 1976; Weick, 1979) and our ten interviewees also hardly mentioned any cycles. The only cycle that appeared during the drawing of a map, was that job satisfaction increased quality of output, while a higher quality of output also increased job satisfaction. When we asked the interviewee whether this worked as a downward or upward spiral, he indicated this was not the case and the effect was primarily from job satisfaction to quality of output.

The weight of each of the 22 links are determined in the questionnaire by sentences, such as ‘If my responsibility would increase, then my job satisfaction would [strongly increase, increase, slightly increase, remain unchanged, slightly decrease, decrease, strongly decrease]’. These seven-point Likert items were coded from -3 (strongly decreased) to +3 (strongly increased). Respondents could also choose ‘I don't know’, which was coded as a missing value. Two exceptions are the links from merger to IT systems and from merger to new tasks, since these links are not bipolar; they only measure the extent to which new tasks and IT systems changed as a consequence of the merger. The questions were ‘How much has the IT systems (respectively, new tasks) changed after the merger?’ with four answer categories (not at all, a little, moderately, much) which were coded from 0 to 3.

In order to improve clarity of instruction and to check whether relevant variables or relationships were missing, the questionnaire was piloted among

seven employees of the organization, different from those interviewed earlier. The employees completed the questionnaire in the presence of a researcher, and were encouraged to comment. Besides some little remarks, the questionnaire appeared to be clear and according to respondents no crucial concepts or links were missing.

An e-mail with a link to the final version of the questionnaire was sent out to those 247 employees who already worked in one of the ancestor organizations prior to the merger. Anonymity was assured. After a week a reminder was sent and after three weeks the questionnaire was closed. By then 151 respondents (61.1 %) had completed the questionnaire.

The use of a questionnaire to collect cognitive map data has advantages and disadvantages. Some scholars (e.g. Eden & Ackermann, 1998) prefer idiographic maps, in which individuals have the freedom to add their own concepts and links, to nomothetic maps as we have collected through our questionnaire. We agree that by limiting respondents to give their view on only a selected set of nodes and links, some information might be lost. On the other hand, in idiographic maps it is sometimes unclear whether respondents using different wording actually refer to different concepts. And if they do not indicate a certain link, whether they actually believe it is not present. Therefore it is necessary to return to the respondents to validate the meaning of certain words and explicate whether they forgot a link or that the link actually does not exist. Consequently, the collection of idiographic cognitive map data among a large set of individuals, is very time consuming. The advantage of collecting nomothetic maps using a questionnaire, is that the cognitive maps of a large group of employees can be collected. And all employees indicate their cognitions concerning the same set of links, rendering maps comparable between employees.

RESULTS

A first test of the validity of our total effects measure *TR* in formula (5) is its correlation with the *overall* effects that individuals report. In our data, respondents were asked to indicate the overall effect they expected the merger to have on each of the four goals.

Our measure for the total effects $TE(P_{mg_i})$ correlated highly with the overall direct effects w_{mg_i}, namely 0.755 for *job satisfaction*, 0.578 for *productivity*, 0.676 for *quality of output* and 0.638 for *collaboration* (N=94, p<0.001). This means that the computation of our measure for the total effect *TE* is meaningful.

We expect that the total result that individuals expect from the means will determine their attitudes towards the means. In the questionnaire we have measured the attitude towards the merger with three items. These items were measured on a seven-point scale from 'strongly disagree' to 'strongly agree' and were worded; 'I find the merger has resulted in a better organization', 'It would be better if the merger had not taken place' and 'I find that I personally have benefited from the merger' (comparable with items from the cognitive resistance scale of Oreg, 2006). The scale was reliable (Cronbach's α = 0.64) and on average employees believed that the merger was not beneficial (*M* = -0.53*; SD* = 1.43). The correlation between attitude and $TR(m)$ is 0.57 (p<0.001), indicating that our total result measure *TR* is a good indicator for the attitudes towards the merger.

Results detection crucial conflict links

We want to detect the links on which the variance in the causal weights between individuals contributes most to the variance in the total result. Table 1 gives the variance for the links w_{ij}, ordered by size. The variance is the squared deviation of the mean weight on the specific link, among our 94 respondents. The largest variances are on the links *merger* → *responsibility* and *new tasks* → *job satisfaction*. So the respondents differ most in their perceived weight of the effect from the *merger* on *responsibility* and the effect from the *new tasks* on *job satisfaction*. On the other hand, their cognition concerning the strength of the effects from the *merger* on the *IT systems* and from *collaboration* on *quality of output*, are most in line with one another. This can be concluded from the relatively small variances of these two links in Table 1.

Note that the variance of the links *merger* → *productivity* and *merger* → *quality of output* are not given in Table 1. The reason therefore is that the weights on these links do not contribute to the calculation of the total result *TR*, since they

are not part of an indirect path from means to ends. The other twenty links are part of a path from means to ends.

We will show that the links on which the variance is relatively large, are not necessarily the links on which reaching agreement contributes most to alignment of the attitudes towards the merger, i.e., to reduction of the variance in total result $\sigma^2\left(TR \mid w_{ij}^{[\alpha]} = \overline{w_{ij}}\right)$ using formula (6) to (8).

Link $v_i \rightarrow v_j$	$\sigma^2(w_{ij})$
Merger → Responsibility	2.575
New tasks → Job satisfaction	2.192
Merger → Job satisfaction	2.133
Merger → Collaboration	1.782
IT systems → Job satisfaction	1.520
New tasks → Productivity	1.239
New tasks → Collaboration	1.180
IT systems → Productivity	1.180
New tasks → Quality of output	1.132
IT systems → Quality of output	0.929
Responsibility → Job satisfaction	0.900
Merger → New tasks	0.852
Responsibility → Collaboration	0.808
Responsibility → Productivity	0.746
Job satisfaction → Productivity	0.735
Responsibility → Quality of output	0.688
Collaboration → Productivity	0.687
Job satisfaction → Quality of output	0.644
Collaboration → Quality of output	0.580
Merger → IT systems	0.528

Table 1: Variance in weights on direct links in the cognitive maps.

The actual variance in TR, i.e., the variance before agreement is reached on any link, is $\sigma^2(TR) = 0.2765$. We will calculate the variance in TR that we expect if consensus is reached on one of the links in the cognitive map, assuming that this consensus will be the average weight $\overline{w_{ij}}$ assigned to that link by the respondents in our sample. First, we overwrite the actual weight a respondent assigned to a specific link by that average weight, using formula (8), while we leave the rest of the weights unchanged. Then we use formulas (3) to (6) to calculate the total result of each of the respondents, based on these maps in which we have overwritten the weight of this one link. From these total results

we calculate the variance $\sigma^2\left(TR \mid w_{ij}^{[\alpha]} = \overline{w_{ij}}\right)$. Table 2 gives an overview of the variance in *TR* when the weight of one link would be equal to the average sample weight assigned to that link. The variance in the total result expected from the *merger* will be reduced most if there would be consensus on the effect of the *merger* on the *responsibility*, followed by the link between *new tasks* and *collaboration* and the link from *new tasks* to *job satisfaction*.

Especially the effect of consensus on the link from *new tasks* to *collaboration* is interesting. The variance on six other links was larger than the variance on this link (see Table 1). But if we regard the level of reduction in the variance of TR, agreement on this link ranks second. In contrast, the variance on the link from *merger* to *job satisfaction* was quite large (Table 1), while consensus on this link would hardly reduce the level of variance in total result TR (Table 2).

$v_i \rightarrow v_j$: link on which agreement is reached	$\sigma^2\left(TR \mid w_{ij}^{[\alpha]} = \overline{w_{ij}}\right)$*
Merger → Responsibility	0.117
New tasks → Collaboration	0.190
New tasks → Job satisfaction	0.205
New tasks → Quality of output	0.221
Merger → New tasks	0.221
IT systems → Job satisfaction	0.223
Responsibility → Collaboration	0.231
Responsibility → Job satisfaction	0.241
Merger → IT systems	0.253
Merger → Collaboration	0.253
Merger → Job satisfaction	0.255
Collaboration → Quality of output	0.262
New tasks → Productivity	0.265
Collaboration → Productivity	0.266
Job satisfaction → Productivity	0.266
Job satisfaction → Quality of output	0.267
IT systems → Productivity	0.267
IT systems → Quality of output	0.268
Responsibility → Productivity	0.269
Responsibility → Quality of output	0.269

* The variance in TR before agreement is reached on any link is $\sigma^2(TR) = 0.277$

Table 2: Variance in the total result *TR* if consensus is reached on one link.

In Table 3 the reduction in variance in the total result *TR* is calculated if consensus would be reached on two links. This is the result of the minimization

problem (9) for two links, thus for $\overline{S_2}$. We only report the four pairs of links on which consensus reduces the variance in *TR* most. Table 3 shows that the variance of *TR* reduces most if consensus is reached on the link *merger* → *responsibility*, supplemented with respectively *new tasks* → *collaboration* ($\sigma^2\left(TR|\overline{S}\right)=0.067$) or *new tasks* → *job satisfaction* ($\sigma^2\left(TR|\overline{S}\right)$=0.073). But also consensus on the links *merger* → *job satisfaction* and *merger* → *collaboration* will largely decrease the variance in total result ($\sigma^2\left(TR|\overline{S}\right)$=0.102).

It might seem obvious that consensus on the pair of links *merger* → *responsibility* and *new tasks* → *collaboration* results in the largest reduction of variance, since these were the two links that separately reduced variance in *TR* most (Table 2). However, it is possible that consensus on each member of a set of links separately hardly reduces variance in *TR*, while consensus on the entire set would reduce *TR* variance to a large extent. An example is shown in Table 3. If consensus is reached on the links *merger* → *job satisfaction* and *merger* → *collaboration*, this rank fourth in the ordering of how much *TR* variance is reduced, while these links separately hardly reduce the variance in *TR* (see Table 2).

$\overline{S}$: set of links on which agreement is reached	$\sigma^2\left(TR\|\overline{S}\right)$*
Merger→Responsibility and New tasks→Collaboration	0.067
Merger→Responsibility and New tasks→Job satisfaction	0.073
Merger→Responsibility and IT systems →Job satisfaction	0.081
Merger→Job satisfaction and Merger→Collaboration	0.102

* The variance in *TR* before agreement is reached on any link is $\sigma^2(TR)=0.277$

Table 3. Variance in the total result *TR* if consensus is reached on two links.

These results indicate that dissensus on the weight of the link *merger* → *responsibility* contributes most to the differences in attitudes, followed by dissensus on the link *new tasks* → *collaboration*. Especially the effect of consensus on this latter link would not have been found if only the variances on each of the links would be considered in isolation of the other links in the maps and the paths it is part of (see Table 1). Thus, a naive person would argue that on links on which the variance is large, there is still 'much consensus to win'.

However, consensus on these links does not necessarily contribute much to agreement among the employees concerning their attitude towards the merger. This leads to the counterintuitive conclusion that it might be more relevant to promote consensus on a link on which there already is little variance, if this link is part of many paths from means to goals.

DISCUSSION

Attitudes of individuals towards a means are rooted in their cognition concerning the causal effect the means will have on relevant goals. We have proposed a measure to compute the total results *TR* individuals expect from the means, based on their weighted cognitive map. We have found that this measure correlates with their attitudes towards the means, suggesting that the attitudes of individuals can be derived from their cognitive maps. As a next step we have proposed and applied a method to detect links in the cognitive maps of a group of individuals on which the different cognitive views contribute most to the variance in the expected total result of the means.

Our measures and methods are practical tools to search for differences in the cognitive maps of individuals that result in different attitudes towards the means. In order to reduce the variance in attitudes towards a means, the cognition of employees should be aligned, for instance through debate. Aiming for perfect alignment of the causal cognition of employees is often unrealistic and will be time consuming. Therefore it is interesting to detect which causal differences contribute most to the variance in attitudes. As our data show, the links on which the variance is large, are not necessarily the links on which reaching consensus will decrease the variance in attitude most. Disagreement on the strength of a link that is part of several paths, can result in more diverse attitudes towards a means than a larger disagreement on a link that is only part of one path from means to ends. Put differently, putting much effort in increasing consensus on a link on which individuals have divergent cognitions, is hardly useful if it concerns a rather irrelevant link, i.e. a link that will be part of hardly any arguments supporting or rejecting the means.

Our approach also has implications for the debate about whether cognitive diversity in a work teams is beneficial or detrimental for team performance.

Some scholars have argued that in teams whose members have a shared cognition, widely supported decisions are made easily, thereby enhancing team performance (Klimoski and Mohammed, 1994; Mohammed and Dumville, 2001; Cooke et al, 2000; Cannon-Bowers and Salas, 2001). Others argue that such teams lack the disagreement and debate necessary to identify optimal solutions, and that cognitively diverse teams will perform better (De Dreu and Van de Vliert, 1997; Tjosvold, 1998; De Dreu, 2006; Tjosvold, 2008). Our measures and methods complement this debate, since they express the extent to which cognitive differences result in different attitudes towards the means. This makes explicit the existing trade-off between a fuller exploration of alternative means on the one hand, and conflicting attitudes towards the chosen means on the other.

Collection and interpretation of weighted cognitive map data

There is debate over the way to collect data capturing the cognitive maps of individuals and over the quality of the data, resulting from either method. Eden and Ackermann (1998) prefer idiographic cognitive maps to nomothetic ones, giving individuals freedom to add their own concepts and links. We agree that by limiting respondents to give their view on only a selected set of nodes and links, some information might be lost. However, in order to compare maps, we have chosen to use questionnaires and collect data on the same set of links and nodes for all individuals, and to develop measures and methods for such data. This set of links and nodes were selected after interviews in which idiographic data was collected. If the preliminary work of selecting the crucial links and nodes is done properly, we believe the missing information is not crucial for the attitude of an employee. An advantage of using questionnaires is that all individuals give their vision on the same set of relationships, also explicitly indicating when a certain relationship does not exist, according to them.

Through the selection of the set of links no cycles could appear in the maps of the employees. The measures we propose can only be used in acyclic maps, since a path containing a cycle would be infinitely long. according to some scholars (Weick, 1979; Bougon et al, 1990) loops occur often in real life and maps without cycles should raise questions. However, in the interviews we conducted the only

cycle that was mentioned, appeared not to be a continuous loop and the interviewee could indicate which direction was stronger. Axelrod (1976) also found that cycles hardly pop up in maps. Eden et al (1992) state that loops deserve special attention for two reasons. One reason is that the loop can be the result of a coding error that needs correcting and the cycle can be coded into a hierarchy. Another reason is that the loop actually exists, so the individual recognizes growth, decline or feedback control.

According to some scholars (Kosko, 1986; Larichev, 1992) in layman theories the causal assertions individuals make are at best ordinal, e.g. weak, moderate and strong. We have asked respondents to indicate on a seven point Likert scale the extent to which an increase in one concept in the map would make another concept decrease, increase or remain unchanged. And we have interpreted these answers as being on a ratio level. Although we agree that it is a cognitive hard task to assign such weights and that it is not defined what for instance 'strongly increase' would mean in reality, respondents seemed to be able to answer the questions. Furthermore the measure *TR* we propose for the total result of the means, based on these maps, did correlate high with attitude, as expected. So we believe that individuals are able to intuitively assign weights to the links in the maps that can be interpreted at a ratio level.

Future research

In the data used in this paper, we have no information concerning the priorities that employees assign to each of the four goals, and we assumed the salience to be equal over the goals. Therefore employees with the same cognitive maps are assumed to have the same attitude towards the change. However, individuals might also attach conflicting saliences to each of those goals. This might result in conflict about the means, even if they agree about the effects from means to goals. Suppose they agree that a means will have a positive effect on one goal, for instance productivity, and a negative effect on another goal, for instance quality. If for one individual the goal productivity is relatively more salient than quality of output, while for the other individual the goal priorities are vice versa, the latter might oppose the means while the former supports it. Then the conflict is not rooted in cognitive differences, but in different goal saliences. While in the

current paper we assume that employees with exactly the same cognitive map, will have the same attitude towards the means, the addition of goal salience will give a more diverse image of the roots of conflict.

In our example, the merger was the only means. Individuals could either support the merger or oppose it. Cognitive maps could also be collected about the consequences of several alternatives. Then the individuals might oppose a means of which they do see mainly positive consequences, if in their view another alternative is even better. The presented methodology is able to investigate this phenomenon.

We have assumed that after a causal link is discussed in a group, each employee will agree on the average sample weight on that link. To us this seems a natural reference point, but other reference points could be chosen and incorporated in our measures. Other possible reference points are for instance the mode of the sample or the weight that a certain group of experts expects, or the weight in a map of a person who wants to convince a grassroots. If for instance a politician has insight in the cognitive maps of a group of voters, concerning the consequences of a certain policy change, (s)he could compute on which links to convince these voters in order to gain more support for the policy change.

In order to test whether our method to detect the crucial cognitive differences actually helps to reach agreement easier through discussing certain links in the group, experiments should be conducted in which one part of the group just discusses the matter, while in the other part of the group those links are discussed that are most crucial according to our algorithm. If in the latter group the level of conflict is reduced more than in the former group, our method would proof useful.

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IV. CONTEXT OR CONSONANCE?

COGNITION FORMATION CONCERNING ORGANIZATIONAL CHANGE*

ABSTRACT

Employees' cognitive reactions to organizational change are often divergent; some expect positive consequences of the change, while others expect negative consequences. How are employees' cognitions shaped? In the literature two different processes are described, one at the inter-individual level and one at the intra-individual level. The inter-individual explanations of cognition formation focus on social processes, like influence, and predict that group membership and social position explain cognition. Intra-individual processes of cognition formation are the tendency to avoid ambivalence; individuals strive for cognitive consistency. In the current study we hypothesize that both processes exist. We test these hypotheses on cause map data of the consequences of four organizational changes in the Dutch semi-public sector. In these cause maps, we included goal hierarchy. Using multivariate multilevel models in which the change impact perceptions of a change on several goals are nested within individuals, we can analyze the correlation structure of intra-individual cognition, controlling for group membership and social position. We found that more similarity in cognitions existed between employees within the same hierarchical level or within the same department. Furthermore the expected effect of a change on one goal and the effect on another goal, were correlated within individuals, i.e. their cognitions were consonant. These findings imply that both inter-individual and intra-individual processes shape employees' cognition.

* Coauthored by Rafael Wittek and Jacob Dijkstra. The data were collected in collaboration with Birgit Pauksztat and Lea Ellwardt. We thank the organizations and the respondents for their support, Marijtje van Duijn for statistical advice and feedback and Birgit Pauksztat and Frans Stokman for comments on earlier versions of this chapter.

INTRODUCTION

The diversity of reactions to planned change still constitutes one of the major puzzles in the field of organization science (Lockett, Currie, Finn, Martin, & Waring, 2014). Why do employees in similar positions, and with comparable job and personal characteristics, sometimes exhibit so strongly diverging attitudes and behaviors towards change, whereas in other instances, reactions of employees who differ considerably on these dimensions are surprisingly similar? (Armenakis & Bedeian, 1999; Cannon & Edmondson, 2001).

During the past six decades, considerable progress has been made to better understand the antecedents and consequences of these reactions to change (Oreg, Vakola, & Armenakis, 2011). For quite a while, most of the contributions to this literature came from studies on resistance to change, i.e. reactions that management considers "negative" or "unfavorable" (Pardo del Val & Martinez Fuentes, 2003). Piderit (2000) suggests to abandon the "resistance" concept, and to use the more fine-grained distinction between behavioral, emotional, and cognitive reactions to change. Piderit pointed to *ambivalent reactions* to change as an important but neglected issue. Ambivalence occurs if reactions are incongruent either across or within the three domains of reactions (behavioral, affective, and cognitive). For example, cognitive ambivalence can occur if an employee believes that a change has both positive and negative effects on different outcomes.

According to a recent review (Oreg et al., 2011) covering 60 years of research into reactions to organizational change, the majority of the 79 quantitative studies on this topic cover behavioral and emotional reactions (78.5%). Despite the relative paucity of systematic empirical research on cognitive reactions to change, the evidence that is available demonstrates that cognitive representations of change can be very strong predictors of a variety of outcomes, and that alignment of causal cognitions across organizational members can be a critical success factor for change implementation (Bartunek, 1984; Isabella, 1990; Reger, Mullane, Gustafson, & DeMarie, 1994; Labianca, Gray, & Brass, 2000).

The present article builds on these attempts to explain variations in cognitive reactions to change. A core theme in current explanations is the relative contribution of *contextual* antecedents in explaining reactions to change (Oreg et al., 2011:466; see also Herold, Fedor, & Caldwell, 2007): group membership, processes of inter-individual influence, and, more recently, the impact of individual social position (Lockett et al., 2014). But whereas the strong focus on contextual antecedents yielded important insights, it also came at the expense of attention for *intra-individual* cognitive processes. In fact, a substantive body of research points to the strong tendency of the human mind to *reduce* cognitive dissonance, ambiguity, and uncertainty (Heider, 1958; Festinger, 1957; Kruglanski & Webster, 1996; Lindenberg, 2006). These intra-individual processes likely affect reactions to organizational change, but it is as yet unclear how they interact with contextual antecedents. Therefore, an open question remains how the powerful contextual forces that were found to shape cognitive reactions to change in previous research relate to the equally well documented intra-personal tendency towards cognitive consistency. In the current paper we propose and empirically apply a rigorous method for teasing apart contextual and intra-personal effects on cognitive reactions to change, and thus contribute to answering this question.

Cognitive processes related to reactions to change have not been entirely neglected. Piderit (2000) provides anecdotal evidence for the existence of ambivalent reactions, and – pointing to research on attitude formation – argues that ambivalent reactions are actually likely to be widespread particularly during the onset of a change. But though Piderit's framework of multidimensional reactions to change elaborates in detail on the potential positive and negative effects of cognitive ambivalence, it does not theorize cognitive ambivalence as such. Ambivalent reactions are simply assumed to exist, rather than explained. However, cognitive ambivalence is at odds with the aforementioned cognitive dissonance theory. From a cognitive dissonance perspective, intra-individual mechanisms should result in *far lower* prevalence of ambivalent cognitive reactions than one would expect based on Piderit's account.

Our study examines the question how individual level cognitive reactions to change can be explained by contextual conditions and intra-individual processes. In order to overcome the limitations of previous strategies to measure cognition, we develop a new measure of perceived impact of change based on cause map data collected in a paper and pencil survey in two Dutch non-profit organizations (102 and 97 respondents). Multivariate multilevel models are used to test to what degree individual cognitive reactions are due to contextual conditions, or to intra-individual tendency towards cognitive consonance.

Our study enriches current scholarship in at least three respects. First, whereas the current research agenda on cognitive reactions focuses on conditions external to the individual – group membership, social position, patterns of interaction – our study elaborates on the role of intra-individual cognitive mechanisms. Drawing on theories of motivated cognition, we argue that there will be a strong tendency towards cognitive consonance (Festinger, 1957; Heider, 1958) and the reduction of intra-personal cognitive ambivalence (Piderit, 2000). This tendency to align cognitions about organizational change in order to avoid ambiguity cuts across organizational positions, group memberships, and individual level background characteristics.

Second, we present a more fine-grained approach to cognitive ambivalence. So far, relatively coarse-grained attitudinal measures are used to assess cognitive reactions to change. Cognitive dissonance concerning consequences of organizational change occurs if employees expect both positive and negative consequences of the change. Dissonance can be reduced through two mechanisms. First, it can be reduced through acquiring new information, i.e. adapt the cognition over how much a change contributes to reaching a certain goal. Second, the importance of reaching a certain goal can be reduced (Festinger, 1957). We introduce the concept of change impact perception (CIP) to refine the theoretical construct of cognitive reactions to change. For the CIP not only the causal effect from an organizational change on several goals is considered, also the goal salience is taken into account. With our novelty of introducing goal salience in the measurement of perceived cause-effect relations,

we show that the literatures on organizational change and causal mapping can be fruitfully combined.

Third, we conducted one of the first empirical survey based studies collecting structured causal mapping data of change related cause-effect relations in a sizeable sample of employees. Applying multivariate multilevel statistical techniques allows us to disentangle contextual effects from intra-individual cognitive processes.

The remainder of this paper is structured into four parts. The next section provides a brief assessment of current research on cognitive reactions to change. This is followed by a theory section, in which testable hypotheses are derived. Research design and measurement strategy are presented thereafter. A discussion section concludes.

PREVIOUS RESEARCH

The present study focuses on cognitive reactions to change, i.e. beliefs about action-outcome linkages that express a "positive or negative evaluation of greater or lesser extremity, and occasionally are exactly neutral in their evaluative content" (Eagly & Chaiken, 1998: 271). Progress in this field so far comes from three different and only partially overlapping literatures.

One line of research conceptualizes cognitions as attitudes and dispositions (Choi, Sung, Lee, & Cho, 2011; Piderit, 2000), and uses standardized psychometric scales to assess change related individual level beliefs and attitudes. Studies along this line also explore the interplay between cognitive conflict and resistance to change. Drawing on consensus theories, several studies show that shared cognition between management and employees increases the likelihood for successful implementation of planned change (Reger et al., 1994; Labianca et al., 2000; Markóczy, 2001). In contrast, group decision-making researchers stress the beneficial effects of cognitive conflict as a way to avoid groupthink (Janis, 1982) and improve the quality of decision-making processes (De Dreu & Van de Vliert, 1997; De Dreu, 2006; Mohammed & Ringseis, 2001; Jehn & Mannix, 2001; Mooney, Holahan, & Amason, 2007; Tjosvold, 2007).

However, empirical evidence so far remains inconclusive, and there is also little agreement about the measurement of shared cognition (Mohammed, Klimoski, & Rentsch, 2000).

A second line of research links cognitive reactions to change to "sense-making", i.e. "efforts to create order and make retrospective sense of what occurs" (Weick, 1993: 635). Grounded in theories of social constructivism, this research uses a more complex conceptualization of cognitions, and relies on qualitative in-depth research to uncover inter-individual differences in sense-making processes (Lockett et al., 2014).

Finally, a relatively recent third alternative occupies an intermediate position between the large-scale survey studies on change attitudes, and qualitative sense-making approaches. It uses causal mapping techniques to elicit and represent cognitive representations of perceived cause-effect relationships. Collective change attitude is then studied by aggregating these individual cause-effect perceptions into group maps, which are subsequently compared along dimensions like size, structure and content before and after a change (e.g. Iederan, Curseu, Vermeulen, & Geurts, 2011).

All current approaches share a strong emphasis on contextual predictors of cognitive reactions to change. Cognitive representations – beliefs on cause-effect relations, attitudes about the change – are assumed to be the product of an individual's position in the social fabric, as well as of the characteristics of the social context itself.

THEORY

In order to answer our research question concerning the interplay between contextual conditions and intra-personal processes, we complement contextual approaches with a bounded rationality perspective on cognitive reactions to change (Gavetti & Levinthal, 2000). More specifically, we build on theories of motivated cognition, in particular *goal-framing theory* (Lindenberg, 2006). A key assumption of this approach is that selective attention guides the creation of simplified and consistent cognitive representations of reality. Individuals'

perceptions are influenced by a *hierarchy* of goals, meaning that some goals are more salient than others. In the process of structuring cognitive representations of reality (building mental models, see Legrenzi, Girotto, & Johnson-Laird, 1993), these dominant goals push the less salient goals into the background, with the result that cause-effect perceptions are mainly framed in light of the most salient goal. Combined with the strong tendency to reduce cognitive dissonance, this leads to an individual cause map in which most perceived cause-effect relations are aligned along the effects on the dominant goal. Whenever individuals differ in their goal hierarchies, therefore, inter-personal differences in terms of perceived effects on the most dominant goals will propagate through their respective cause maps due to dissonance reduction, exacerbating inter-personal conflict. Moreover, differences in goal hierarchies are likely due to organizational contextual conditions, such as being part of management or the workforce, or the department in which one works. Thus, our theoretical perspective combining goal framing theory with cognitive dissonance theory allows the integration of contextual conditions and intra-personal processes in the explanation of cognitive reactions to change. Our theoretical perspective has major implications for how to operationalize the theoretical construct of cognitive reactions to change. The remainder of this section will therefore first discuss the theoretical construct of *change impact perception* as it follows from our theory, before presenting hypotheses on contextual and consonance effects.

CHANGE IMPACT PERCEPTIONS

Previous research has emphasized that cognitive conflicts between individuals can have two completely different sources: they can be due to differences in causal cognition, or due to incompatible goals (Deutsch, 1973; Brehmer, 1976; McGrath, 1984; Tjosvold, 1985; Tjosvold, 1998; Jehn, 1997). Despite its importance, the distinction between cause-effect perceptions and divergence or congruence of goal hierarchies has not yet been systematically elaborated theoretically and empirically. In order to do so, we make the following assumptions.

First, individuals hold cause-effect beliefs, in which one or more perceived causal conditions (A, B, C….) are supposed to have effects on one or more outcomes (a, b, c…). Effects can be positive or negative (in the sense of the cause resulting in an increase or decrease of the outcome), or absent (i.e. a causal condition is perceived not to have any impact on the outcome).

Second, an individual can believe that a single causal condition can simultaneously affect more than one outcome (positively and negatively), and that a single outcome can be simultaneously affected (positively or negatively) by multiple causal conditions.

Third, there are two types of outcome conditions: (a) Ultimate outcomes that are related to individual or organizational goals or utilities (Anthony, Heckathorn & Maser, 1994). Individuals attach differential importance to this set of goals, and individual goal hierarchies may thus differ across individuals; (b) Intermediate outcomes that do not represent goals, but may be seen as instruments to reach these goals.

In order to disentangle different types of *inter-personal* cognitive conflict or consensus and *intra-personal* cognitive consonance or ambivalence, the following illustration is useful. Assume two individuals (1, 2), two causal conditions (A, B) – organizational changes in our study – and two outcomes (a, b).

Assessing the presence of cognitive consonance or ambivalence requires the presence of either more than one causal condition (e.g., organizational intervention), more than one outcome, or both. Four types of *intra-personal cognitive consonance* or dissonance can be distinguished. *Single intervention cognitive consonance* is given if a specific causal condition A is believed to have positive effects (in the sense of improving the achievement of desired organizational or personal goals) on both outcomes a and b. *Multiple intervention cognitive consonance* is given if an employee believes that causal conditions A and B both have *either* negative or positive effects on both outcomes a and b. Conversely, *single intervention cognitive dissonance* or ambivalence (Piderit, 2000) is given if an employee believes that causal condition A has a positive effect on outcome a, and at the same time has a negative effect on outcome b (or

vice versa). *Multiple intervention cognitive dissonance* is given if causal condition A has a positive effect on outcome and causal condition B has a negative effect on outcome a (or vice versa). Note how single and multiple intervention cognitive dissonance are *not* mutually exclusive.

Second, four different types of *inter-personal cognitive conflict* may occur. First, *full cognitive consensus* is given in situations where individuals 1 and 2 share the same cause-effect perceptions and goal hierarchy concerning the ultimate outcomes. Second, *goal conflict* is given when both have the same cause-effect perceptions (e.g. both individual 1 and 2 perceive a positive effect of causal condition A on the outcomes a and b), but have different goal hierarchies (e.g. individual 1 finds outcome a more important than outcome b, while individual 2 holds the opposite opinion). Third, *cognitive conflict* occurs when both have different cause-effect perceptions, but have the same goal hierarchy. Finally, *full cognitive conflict* is given if both cause-effect perceptions and goal hierarchies are different. Note that full cognitive conflict can very well be *latent* in the sense that the final evaluations of the causal conditions A and B by both individuals are similar (e.g., both deeming A 'a good thing' and B 'a bad thing'). In such a case, the differences between the individuals in terms of cause-effect perceptions and goal hierarchies happen to cancel each other out. In the current study we explain intra-personal conflict.

Clearly, when assessing to what degree the perceptions of two individuals concerning the impact of change converge or diverge, both the cause-effect perceptions and the goal hierarchies need to be taken into consideration. In the methods section we propose the weighted effect measure CIP that does just that.

CONTEXT EFFECTS ON CIP

Contextual explanations of perceived reactions to change identified two major categories of antecedents: group membership (e.g. being in the same department), and organizational position (e.g. being part of management). These conditions exert their effects on cognitions through a variety of mechanisms, reflecting the adage 'Where you stand depends on where you sit', which is sometimes also referred to as Miles' Law (Miles, 1978; Berman, Martin, & Kajfez,

1985). In terms of our theoretical approach, occupying similar organizational positions or being member of the same group may lead to shared goal hierarchies and priorities (Marsden, 1990; Mayhew, McPherson, Rotolo, & Smith-Lovin, 1995), which through processes of dissonance reduction lead to shared cognitions, which are reinforced through similar work experiences (Hambrick & Mason, 1984). For example, employees in R&D departments often value quality of output more than cost reduction, whereas the opposite holds for sales personnel (La Porte, 1965), leading to different goal hierarchies. Shared group membership additionally implies similar socialization processes, and stronger mutual social influence through daily interaction (Reger et al., 1994; Weick & Roberts, 1993; Bacharach, Bamberger, & Sonnenstuhl, 1996; Mäs & Flache, 2013).

Goal framing theory argues that human cognition is motivated by dominant goals, leading to selective attention: individuals take information that suits their initial attitudes (which are strongly affected by the perceived effects on the dominant goals) more seriously than information that is at odds with their attitudes. This reasoning chimes with the literature on *preference bias* (Lord, Ross, & Lepper, 1979; Greitemeyer & Schulz-Hards, 2003). Therefore, we expect that similarity in organizational position will increase similarity in causal cognition:

> Hypothesis 1 (Context Effects): The likelihood for consensus about change impact perceptions will be higher between employees who (a) occupy similar positions in the organization (hierarchical level) or (b) are members of the same group, compared to employees in different organizational positions or groups (department).

CONSONANCE EFFECTS ON CIP

The dissonance reduction processes in our theory suggest that cognitive ambivalence will be short-lived and will therefore be far less prevalent than current research on change cognitions suggests. Two major cognitive

mechanisms have been proposed. The first one suggests that individuals have an innate need for cognitive closure, because they do not feel at ease when cognitive dissonance occurs. As a consequence, they want to avoid ambiguity and confusion (Kruglanski & Webster, 1996). They will seek consistency in their attitudes and beliefs (Heider, 1958), and they will attempt to reduce cognitive dissonance in case they face it (Festinger, 1957). This results in a chronic confirmation bias, which leads individuals to search for and interpret information in a way that confirms their existing attitudes and beliefs, and to neglect or downplay the importance of information that is at odds with their preconceptions (Lord et al., 1979; Wittenbaum, Hollingshead, & Botero, 2004).

The second approach emphasizes motivated cognition rather than innate biases. More specifically, goal framing theory suggests that human perception is selective and strongly driven by the goal that is salient for the individual in a given situation (Lindenberg, 2006). Background goals can either temper or boost the salience of the dominant goal. Conversely, the salient goal can spill-over to inhibit or enhance the salience of background goals (Keizer, Lindenberg, & Steg, 2008).

With regard to CIP, both explanations suggest that individuals will either try to find pieces of information and arguments that are aligned with their salient preferences concerning the change, or they will bring their existing perceptions in line with the salient goal. There are two ways how employees can reduce ambivalent change impact perceptions: they can either change the relative importance they attribute to an outcome, or they can change their perception of the strength of the causal effect. Take the example of an employee perceiving several negative effects of a change (e.g. centralization of ICT support in his firm) on a variety of organizational outcomes (e.g. autonomy of unit managers, loss of personal contact to ICT personnel, higher level of formalization), while simultaneously expecting a positive effect on cost reduction. This employee could reduce this cognitive ambivalence either by assigning a lower priority to the outcome “cost reduction”, or by changing the perceived strength and/or sign of the positive effect (e.g. the employee may reason that the expected cost

savings may be far lower than projected, so that the expected effect on cost reduction will be weaker).

Hence, according to our theoretical approach, if employees initially evaluate the change positively because they think it will have a positive effect on important goals, they will also evaluate the effects on *other* ultimate outcomes more positively. Conversely, if employees initially oppose a change because they believe some important ultimate outcome will suffer, they are likely also to see negative or less positive effects on *other* goals. This also implies a low incidence of ambivalent change impact perceptions, i.e. causal expectations consisting of both – strongly positive effects on some outcomes, *and* strongly negative effects on other outcomes.

> Hypothesis 2 (Consonance Effect): Employees are more likely to hold consonant rather than ambivalent change impact perceptions. The tendency towards cognitive consonance as opposed to cognitive ambivalence will hold independently of the organizational position, group membership or individual background characteristics of an employee.

RESEARCH DESIGN AND DATA

The kind of cognitive data that is needed in order to simultaneously test both the context and consonance hypotheses needs to meet the following minimal requirements: the sample of employees should exhibit enough variation in terms of social position and group membership; the respondents should face a real life planned organizational change; change impact perceptions should involve more than one outcome; information should be gathered on both perceived positive or negative cause-effect relations and the relative salience of the outcomes (i.e., goal hierarchies).

The present study collected this data in two Dutch non-profit organizations with a few hundred employees each: a forensic psychiatric center and a youth welfare organization. In both organizations two changes were planned that affected a large group of employees. These changes are episodic rather than

continuous (Weick & Quinn, 1999), representing occasional interruptions intended to reach specific goals.

The forensic psychiatric center, which used to be part of the Dutch Ministry of Justice, underwent a *privatization*. This change was not initiated by management but was a consequence of a political decision at the national level. Whereas management was in favor of the privatization, the change evoked mixed reactions among employees who would lose their status as civil servants. Simultaneously, a new *care program* was implemented, which changed the type of care given to patients in each phase of their treatment.

In the organization for youth welfare work the major changes consisted in *regionalization* and the introduction of a new *IT-system* for reporting developments in the treatment process. The regionalization meant that several regional offices had to be set up. They were to replace the central office, and took over coordination and management of the various local branches of the organization.

In order to ensure data quality and generate measurement instruments that allow the production of meaningful cause maps, a three step data collection procedure was applied (cf. Hodgkinson, Maule & Brown, 2004; Markoczy & Goldberg, 1995). First, in-depth interviews were held with key informants in order to elicit a first set of relevant change outcomes ("goals") and the perceived causal chains preceding them. Second, based on the information elicited during the first phase, a survey instrument was developed and tested in a pilot study; the instrument consisted of a set of closed questions through which the salience of outcomes as well as positive or negative cause-effect relations were elicited. In a third step, the adapted questionnaire was distributed in a larger sample of employees in both organizations.

In-Depth Interviews

Cause maps about the consequences of the changes were gathered through semi-structured face-to-face interviews (Huff, 1990; Huff & Jenkins, 2003) with ten employees of each organization. These informants occupied different positions

in the hierarchy, and came from different departments. The interviews were held at each organization's head-office and lasted for about one and a half hours. Interviews were audio taped and subsequently transcribed.

Cause maps are mental representations of the perceived causal consequences of a change held by groups or individuals (Axelrod, 1976; Eden & Spender, 1998; Huff & Jenkins, 2003; Hodgkinson, Maule, & Brown, 2004; Hodgkinson & Healey, 2008). The maps consist of variables represented by nodes and perceived causal relations between these nodes depicted by arrows. Figure 1 presents an example of a part of a cause map. It captures an employee's personal theory about the consequences of a change in the forensic psychiatric center.

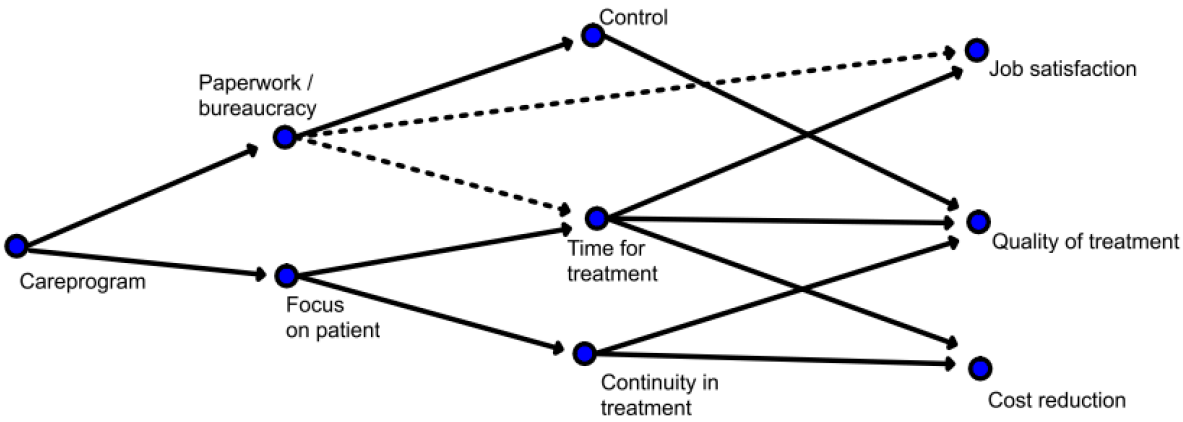

Figure 1: Part of a cause map of an employee about the consequences of the care program change in the Forensic Psychiatric Center**.**
Continuous lines represent positive causal relations, dotted lines negative relations.

The cause map in Figure 1 contains nine nodes and thirteen causal relationships, of which two are negatively signed (the dotted arcs), which means that the cause has a negative impact (i.e. decreases, lowers) on the outcome node. The nodes represent variables that can take different values. The node 'care program' is dichotomous: this change is either implemented or not. According to the individual endorsing this map, implementation of the change will cause an increase in the 'focus on the needs of patients' and in the 'amount of paperwork' documenting the health status of the patient. Increased amount of paperwork, in

turn, will decrease 'job satisfaction' and 'time spent on treatment', but it will also increase 'control' over the treatment's progress and therefore improve the 'quality of the treatment'. Furthermore, this map indicates that a stronger focus on the needs of patients is perceived to result in more 'treatment continuity' (e.g. because treatment trajectories will start sooner). Treatment continuity, in turn, will result in 'cost reduction', since the total treatment trajectory will take less time. Cause maps of other employees may look different. For example, some employees thought that a stronger focus on the patient would result in higher costs, i.e. less cost reduction, since standardized trajectories in which more patients participated, were cheaper.

During structured in-depth interviews, all informants were asked what they thought were the most important reasons to implement the change, and what they believed to be its intended consequences. Informants also indicated whether or not they expected other positive or negative consequences of the change. For each informant, this resulted in a list of outcomes or goals as they were affected by the change. These goals included both *organizational goals* such as cost reduction, and *personal goals* such as job satisfaction. After respondents had given their personal views, they were asked whether they knew of alternative cognitions held by other employees and what these cognitions were. If respondents mentioned that the organizational change was likely to result in increased attainment of a certain goal, we asked whether attaining this goal was something to strive for, for all or some employees. Sometimes the goal appeared to be a sub-goal whose attainment would ultimately lead to the attainment of a higher-level goal. In this way the complete causal reasoning from means to ends was mapped for each goal mentioned by the respondent. If respondents did not report cognitions mentioned by others during previous interviews, we checked whether they were aware of that cognition and asked them to comment on these other cognitions. We also checked differences in terminology used by previous interviewees. For instance 'productivity' appeared to have the same connotation as 'more work can be done'. The interviews produced detailed cause maps for each respondent and revealed the most important goals influenced by the change.

In the forensic center, the important ultimate outcomes (goals) affected by the organizational change were the quality of treatment, employees' job satisfaction and cost reduction. These goals were mentioned in all of the in-depth interviews, and hardly any other goals were mentioned. The goal 'focus on patients' was mentioned frequently as an intermediary (instrumental) goal, contributing to ultimate outcome 'quality of treatment'. In some interviews the ultimate outcome 'safety' was mentioned, but never specifically in relationship with the two organizational changes under consideration (privatization and care program).

In the organization for youth welfare work, five ultimate outcomes were mentioned in all interviews: job satisfaction, workload reduction, uniformity in the way tasks and documentation were done, the amount of information exchange among employees and the so-called client-directedness, indicating the extent to which care was suitable for clients.

Questionnaire Construction and Pilot Study

The most frequently mentioned causes and outcomes/goals elicited during the phase of in-depth interviewing were then inserted into a questionnaire, which also contained questions on employee background characteristics. The causal mapping question asked the respondent to indicate, for each of the two major changes in his or her organization, the effects on each of the goals. Although 'indirect reasoning' (such as the effect of the care program on job satisfaction that runs via the instrumental goal 'bureaucracy' in Figure 1) would have been interesting to investigate, we restricted the measurement to the overall effects of a change – as perceived by the informants – on the ultimate outcomes. Restricting the analysis to these direct effects allows focusing on the total expected effects on the goals. For example, the employee whose cause map is depicted in Figure 1 perceives a mix of positive effects (via increasing focus on patient) and negative effects (via bureaucracy) on job satisfaction. By focusing on the total perceived effect of the change on the outcome 'job satisfaction', we ignore these separate effects but force the employee to assess whether he or she expects the advantages to outweigh the disadvantages.

In order to test the feasibility of the paper-and-pencil questionnaire, we conducted a pilot study among respectively five and seven respondents (different from the informants in the in-depth interviews) in the forensic psychiatric center and the organization for youth welfare work. This step helped to fine-tune the terminology and to improve the questionnaire.

Employee Survey

In both organizations paper-and-pencil questionnaires were used. In the organization for youth welfare work, questionnaires were sent to the home addresses of a simple random sample of 199 employees with an accompanying letter and a return envelope. Our research team assigned identification numbers to these questionnaires, in order to send reminders and to match the questionnaire data with background characteristics (department, tenure) provided by the organization. After two weeks a reminder was sent to those employees who had not yet responded. A second reminder, including an additional copy of the questionnaire, was sent out two weeks later. The data from the questionnaire and the data provided by the organization were merger and anonymized by our research team. The response rate was 70,4 percent (140 of 199 questionnaires). In the questionnaire we have asked whether the change affected the work of the employees. This was the case for 92 respondents, which we used for our analyses.

In the forensic psychiatric center a so-called 'research panel' existed. This was a random stratified sample of employees that had agreed to be available as respondents for this type of research projects. The questionnaire was distributed and collected by the internal research department, who also sent reminders. The response rate was 56,8 percent (108 responses from 190 panel members). Due to missing values 102 questionnaires could be used in our analyses.

In the questionnaire we asked each respondent to personally assess the causal effects of the two changes on the set of most frequently mentioned outcomes as they had emerged during the in-depth interviews. A free-text field was added where respondents could indicate other elements of the organizational change that were important but not listed. Most of the reported comments were

clarifications of the causal reasoning (e.g. why job satisfaction or the level of quality of output would increase or decrease). Furthermore several respondents mentioned that implementation of the changes takes time and that it will take a while before new responsibilities and protocols are clear to all employees. Some comments were given concerning bad communication from management to subordinates prior to the implementation of the changes. Thus only haziness concerning new tasks (and responsibilities) seemed to be a practical consequence that was not included in our questionnaire, but this is a temporal problem. No other consequences of the changes on goals were mentioned, which further confirms the statements concerning relevance and completeness of the list of causes and effects in the cause maps.

MEASURES

Dependent Variables: Change Impact Perception. An employee's perception of how the organizational change affects the realization of several specific organizational goals (e.g. improved client-directedness, cost reduction, workload reduction) forms the basis for constructing our dependent variables. More specifically, a respondent's *change impact perception (CIP)* score is computed as the product of the following two measures.

The first measure is the positive, negative, or neutral *causal effect* the respondent perceives between the change and each outcome. Respondents were asked to indicate on a seven-point scale whether the organizational change would decrease or increase the realization of each goal. Answer categories ranged from "strongly decrease" to "strongly increase", and contain a neutral category ("remain equal"). The three questions read as follows: "The [regionalization, IT-system, …] will result in [client-directedness, costs, workload, …] to strongly decrease / decrease / slightly decrease / remain equal / slightly increase / increase / strongly increase". Variables for costs and workload were reverse coded such that for all variables, higher values represent an improvement of the situation (cost and workload reduction, more client-directedness). We denote the causal effect on goal *i* as e_{g_i}.

The second measure is the relative *goal salience* as perceived by the respondent. The relative importance of each of the goals was elicited by first letting respondents assign the number 100 to their most important goal(s). Subsequently, they were asked to assign a number between 0 and 100 (inclusive) to the remaining goals, representing the relative importance of those goals compared to the most important goal(s). Since some respondents assign high values to all goals and others assign low values to some goals, the *relative* salience of each goal was calculated as the salience of that goal divided by the total salience of all goals. So if there are *n* goals ($g_1,...,g_n$) and s_{g_i} is the salience of the *i*-th goal, then the relative salience of that goal is $s_{rel_{g_i}} = \frac{s_{g_i}}{\sum_{k=1}^{n} s_{g_k}}$.

CIP is then constructed by weighing the causal effects of the change with the relative salience of each of the organizational goals, thus $CIP_{g_i} = s_{rel_{g_i}} \cdot e_{g_i}$. Using the product of these two measures reflects the two cognitive mechanisms individuals use to reduce cognitive dissonance: they either lower the importance they attach to the outcome, or they change the perceived sign and/or strength of the causal effect (Festinger, 1957).

Independent Variables. Organizational position was measured with one measure, *managerial level.* It is coded as a dichotomous variable ("1" = manager, "0" = subordinates). Group membership was assessed with one variable, the employee's main *department*. Both organizations had four different departments. In the forensic psychiatric center these were 'security', 'deskwork', 'treatment', and 'patient' (employees working with patients outside of the treatment activities). In the organization for youth welfare work the departments are 'daycare', '24-hours' for the inpatient care, 'ambulatory' for the outpatient care, and 'deskwork' covering employees doing mostly facilitating office work.

Control Variables. Since demographic background characteristics are found to explain cognitive attitudes (Pelled, 1996; McPherson, Smith-Lovin, & Cook, 2001), three individual level background characteristics were included as control variables. Respondents rated their level of *education* on a ten-point scale ranging

from “elementary school not finished” to “post-academic”. *Tenure* measures the number of years a respondent is employed at the organization. *Gender* is a dichotomous variable, coded “1” for men and “0” for women. Information on tenure and gender was drawn from organizational records. Since there was hardly variation in ethnicity, we did not include this as a control variable.

ANALYTICAL STRATEGY

We are interested in to what degree an employee’s perceptions concerning the impact of one or more organizational changes on one or more specific outcomes can be explained by variations in organizational position, group membership, and beliefs about other change related cause-effect associations. Given the nested data structure (several cause-effect beliefs nested in individuals, nested in departments) we estimated multivariate multilevel models (Snijders & Bosker, 1999) with the CIPs of the two organizational changes on the goals (level-one units) nested within employees (level-two units) as the dependent variables. The CIPs can be regarded as a kind of repeated measures, with the difference that in our data these dependent variables vary over goals rather than time points.

Context characteristics (organizational position, group membership) are added at the employee-level as fixed effects. The *t*-ratio is calculated by dividing the estimates by their standard errors. Since our number of units is much larger than our number of variables, the t-ratio follows approximately a standard normal distribution (Snijders & Bosker, 1999, p. 86).

Cognitive consonance is measured as residual covariance between our dependent variables (i.e. this variable reflects the extent to which the CIP for one goal is positively related to the CIP for another goal) after inclusion of all context characteristics. In order to estimate these covariances, random slopes are included in the model (see Snijders & Bosker, 1999, chapter 12).

We estimated fully multivariate models for both organizations separately, using IGLS in the MLwiN multileveling package (Rasbash, Charlton, Browne, Healy, & Cameron, 2009). Three models per organization were estimated. Model

1 is the empty model. Model 2 adds organizational position (managerial level and department) and personal background characteristics (gender, educational level, tenure). Model 3 adds selected interaction effects between context/background characteristics and perceived causal effects on each of the goals. Only interaction effects that had a significant main effect or interaction effect ($p < .05$) were included. These interactions show whether the main effects hold for all goals and respondents.

In order to test for model improvement, we compare the deviances (-2log-likelihood) of nested models. The change in deviance has approximately a Chi-square distribution with degrees of freedom equal to the number of extra parameters that are estimated in the more elaborate model. In order to test whether the more complex model yields a better fit with the data, we estimated compound symmetry models (not reported), which assume identical residual (co)variances between all dependent variables. The compound symmetry model indeed proved to be significantly worse than the models we report.

A comparison of Model 3 with a model with all covariances set to zero allows us to test for consonance effects as they are predicted in Hypothesis 2. Through comparison of the deviance of this model with Model 3 (in which the random part was not restricted) we test whether the covariances between change impact perceptions on different goals differ significantly from zero.

	Causal effect Privatization →Goal			Causal effect Care program →Goal			Relative salience of Goal		
Goal	M	SD	N	M	SD	N	M	SD	N
Cost reduction	-.05	1.56	87	-.01	1.24	81	.21	.10	92
Treatment quality	-.12	1.33	93	1.09	.99	92	.42	.12	100
Job satisfaction	-.15	1.16	95	.76	1.12	87	.41	.13	101

Table 1A. Descriptive statistics for cognitive variables in the forensic psychiatric center.

	Causal effect Regional. →Goal			Causal effect Care program →Goal			Relative salience of Goal		
Goal	M	SD	N	M	SD	N	M	SD	N
Job satisfaction	.27	1.04	96	-.32	1.17	78	.23	.03	97
Uniformity	-.84	1.36	87	1.11	1.15	79	.18	.04	97
Client-directedness	.64	1.14	80	.38	1.52	76	.23	.04	97
Information	-.09	1.37	97	.63	.92	78	.21	.03	97
Workload reduction	-.46	.87	96	-1.41	.94	79	.15	.06	97

Table 1B. Descriptive statistics for cognitive variables in the organization for youth welfare work.

RESULTS

Descriptive Analysis

Table 1 summarizes descriptive information about perceived cause effect relations. In both organizations, employees differ considerably in their causal cognition: the standard deviations of perceived causal effects are larger than one, on a seven-point scale.

In the forensic psychiatric center, employees on average expect slightly negative consequences of the privatization, but expect positive effects of the care program on job satisfaction and especially on treatment quality. The latter two goals are seen as equally important goals on average, whereas cost reduction is considered 'half as salient'. In the organization for youth welfare work the differences in goal salience are smaller and workload reduction is on average seen as the least important goal. On average employees expect both positive and negative consequences of both organizational changes on the goals.

Table 2 summarizes descriptive information concerning CIPs. It shows that CIPs correlate positively across different changes, possibly indicating cognitive consonance. However, these correlations might disappear if controlling for context characteristics, which will be done in the multilevel analysis. Table 3 presents descriptive information on individual background characteristics.

		1	2	3	4	5	6
1	CIP Priv. → Cost reduction						
2	CIP Priv. → Treatment quality	.21					
3	CIP Priv. → Job satisfaction	.25*	.51***				
4	CIP Careprog. → Cost reduction	.35**	.28*	.14			
5	CIP Careprog. → Treatment quality	.17	.42***	.34**	.29*		
6	CIP Careprog. → Job satisfaction	.04	.28*	.32**	.27*	.68***	
	M	.01	-.09	-.09	.01	.43	.28
	SD	.36	.65	.51	.29	.42	.43
	N	80	91	94	76	90	87

Table 2A: Descriptive statistics and Pearson correlations of the dependent variables in the forensic psychiatric center $^{*}p < .05; ^{**}p < .01; ^{***}p < .001$.

		1	2	3	4	5	6	7	8	9	10
1	CIP Region. → Job satisfaction										
2	CIP Region. → Uniformity	.13**									
3	CIP Region. → Client-direct	.62***	.30***								
4	CIP Region. → Information	.35***	.40***	.41***							
5	CIP Region. → Workload reduction	.01	.14**	.12*	-.06						
6	CIP IT → Job satisfaction	.17**	.27***	.30***	.31***	-.05					
7	CIP IT → Uniformity	.26***	.15**	.18**	.14**	.15**	.22***				
8	CIP IT → Client-direct	.02	.19**	.15**	.25***	-.18**	.50***	.33***			
9	CIP IT → Information	.20***	.41***	.25***	.22***	.01	.40***	.49***	.36***		
10	CIP IT → Workload reduction	-.13*	.05	.02	.11*	.23***	.40***	.13**	.05	.10	
	M	.05	-.15	.15	-.02	-.07	-.08	.21	.07	.12	-.21
	SD	.23	.27	.28	.27	.14	.26	.25	.36	.19	.19
	N	95	87	79	96	94	77	77	75	76	78

Table 2B: Descriptive statistics and Pearson correlations of the dependent variables in the organization for youth welfare work $^{*}p < .05;^{**}p < .01;^{***}p < .001$.

CIP=Change Impact Perception. IT=Implementation of new ICT-System.

		1	2	3	4	5	6	7	8
1	Gender (1=woman)								
2	Education	.05							
3	Tenure (years)	-.22*	-.22*						
4	Manager (=1)	-.16	.40***	-.13					
5	Dep: Patient	-.01	.13	-.14	.06				
6	Dep: Treatment	.07	.16	.14	-.08	-.62***			
7	Dep: Security	-.20	-.44***	.23*	-.02	-.36***	-.15		
8	Dep: Deskwork	.08	-.03	-.15	.02	-.45***	-.19	-.11	
	M	.31	7.57	11.42	.15	.60	.21	.08	.12
	SD	.47	1.47	7.90	.36	.49	.41	.27	.32

Table 3A: Descriptive statistics and Pearson correlations of the independent variables of 102 respondents in the forensic psychiatric center $^{*}p < .05;^{**}p < .01;^{***}p < .001$.

		1	2	3	4	5	6	7	8
1	Gender (1=woman)								
2	Education	.05							
3	Tenure (years)	-.09	-.02						
4	Manager (=1)	-.41***	.22*	.25*					
5	Dep: 24 hours	-.17	-.28**	-.13	-.09				
6	Dep: General	-.09	.31**	.09	.31***	-.37***			
7	Dep: Ambulatory	.13	.01	.20	-.08	-.39***	-.25*		
8	Dep: Daycare	.15	.01	-.13	-.10	-.42***	-.27***	-.29**	
	M	.74	7.56	11.54	.16	.36	.19	.21	.23
	SD	.44	1.38	7.77	.37	.48	.40	.41	.43

Table 3B: Descriptive statistics and Pearson correlations of the independent variables of 97 respondents in the organization for youth welfare work
$^{*}p < .05;^{**}p < .01;^{***}p < .001$.

Multilevel Analysis

The estimates of the fixed effects of the hierarchical models are presented in Table 4A (forensic psychiatric center) and Table 4B (youth welfare work organization). Each respondent has reported CIPs (weighted cause-effect relations) of two changes on three (forensic psychiatric center) or five (youth welfare work organization) goals. Not all respondents reported the consequences of both changes on all of the goals. The models are estimated on 494 CIPs in the psychiatric center and 769 in the organization for youth welfare work.

	Model 1		**Model 2**		**Model 3**	
	Privati-zation	Care program	Privati-zation	Care program	Privati-zation	Care program
Intercept						
CIP → Cost reduction	.01 (.04)	.01 (.03)	.20 (.26)	-.15 (.22)	.11 (.26)	-.16 (.22)
CIP → Job satisfaction	-.11 (.05)	.24 (.05)	.09 (.26)	.09 (.22)	.23 (.26)	.04 (.22)
CIP → Treatment quality	-.05 (.06)	.41 (.05)	.15 (.26)	.24 (.22)	.17 (.28)	.19 (.22)
Background characteristics						
Woman			-.01 (.08)	.11 (.06)	-.01 (.08)	.12*(.06)
Education			-.00 (.03)	.04 (.03)	.00 (.03)	.04 (.03)
Tenure			-.00 (.00)	-.01 (.00)	-.01 (.01)	-.00 (.00)
Manager			.16 (.11)	.12 (.08)	.34*(.16)	.27*(.13)
Dept. Patient			-.28**(.10)	-.14 (.08)	-.40**(.13)	-.12 (.09)
Dept. Treatment			-.18 (.13)	-.15 (.10)	-.18 (.13)	-.14 (.10)
Dept. Security			-.07 (.16)	-.07 (.14)	-.06 (.16)	-.06 (.14)
Interactions						
Tenure x Cost reduction					.02*(.01)	
Tenure x Treatment quality					.01 (.01)	
Manager x Cost reduction					-.20 (.17)	-.28*(.14)
Manager x Treatment quality					-.29*(.14)	-.04 (.10)
Dept. Patient x Cost reduction					.17 (.12)	
Dept. Patient x Treatment quality					.13 (.11)	
Deviance	458.61		426.37		410.73	
ΔDeviance (df)			32.24 (14)**[a]		15.64 (8)*[b]	

Table 4A: Estimates for the hierarchical regression analysis on data of the forensic psychiatric center (standard errors between brackets). N=494

[a]Compared to Model 1; [b]Compared to Model 2. Two-tailed significance levels: * $p < .05$; ** $p < .01$; *** $p < .001$.

In both organizations, Model 3 fits better than Model 2 ($X^2(8) = 15.64; p = .048$ and $X^2(24) = 103.362; p < .001$), and Model 2 has a better fit than Model 1 ($X^2(14) = 32.24; p = .004$ and $X^2(14) = 23.794; p = .049$). For both organizations Model 1 fits much better to the data than the compound symmetry model (not shown). In the forensic psychiatric center the deviance of the compound symmetry model was 591.24 ($X^2(19) = 132.64; p < .001$) and for youth welfare work the deviance was 184.25 ($X^2(57) = 447.34; p < .001$). The latter result means that our models without restrictions on the covariance structure and in which we added the personal and organizational background characteristics of the employees and relevant interaction effects, fit the data best.

Hypothesis 1a predicted employees with similar positions in the organization to have similar CIPs. If the *t*-ratios, i.e. the estimates divided by their standard errors, for the main effect or interaction effect for 'manager' are significant, the hypothesis is supported. *In the forensic psychiatric center* the main effects for being a manager are significant and positive. From the interaction effects follows that compared to subordinates, managers expect the effects of the changes on especially job satisfaction to be more positive (Table 4A). *In the organization for youth welfare work* managers' expected effects from the IT-system on all of the goals are more positive than the expected effects of subordinates, the effect on client-directedness being significant. Compared to other employees, managers also expect larger increases of job satisfaction and information exchange as a consequence of the regionalization (Table 4B). Since for all four organizational changes (part of) the CIPs are explained by group membership, hypothesis 1a is supported. Cognitions concerning the consequences of change are shaped by group membership.

Hypothesis 1b predicted similarity of cognition between employees in the same department. We test this hypothesis by calculating the *t*-ratios for the main effect or interaction effect for 'department'. *In the forensic psychiatric center*, the expected effects of the privatization of employees of the patient department are more negative than those working in other departments; especially they differ in the expected effect from privatization on job satisfaction (the base category in the interaction effect). *In the organization for youth welfare work*, employees in

	Model 1		Model 2		Model 3	
	Regiona-lization	IT-system	Regiona-lization	IT-system	Regiona-lization	IT-system
Intercept						
CIP → Job satisfaction	.06**(.02)	-.07*(.03)	.08 (.07)	.13 (.10)	.03 (.07)	-.08 (.19)
CIP → Uniformity	-.16***(.03)	.21***(.03)	-.15*(.07)	.41***(.10)	-.12 (.08)	-.03 (.20)
CIP → Client-directedness	.15***(.03)	.08 (.04)	.17*(.07)	.27*(.11)	.08 (.08)	-.17 (.26)
CIP → Workload reduction	-.07***(.01)	-.21***(.02)	-.05 (.07)	-.01 (.10)	-.07 (.07)	.25 (.13)
CIP → Information	-.02 (.03)	.13***(.02)	-.00 (.07)	.32**(.10)	-.05 (.07)	.05 (.14)
Background characteristics						
Woman			-.02 (.03)	.03 (.03)	-.02 (.03)	.03 (.03)
Education			-.00 (.01)	.03**(.01)	.00 (.01)	-.06***(.02)
Tenure			.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Manager			.00 (.03)	.20***(.04)	-.07 (.04)	.09 (.05)
Dept. General			-.06 (.03)	-.03 (.04)	-.10* (.04)	-.04 (.05)
Dept. Ambulatory			-.06*(.03)	-.10**(.04)	.00 (.04)	-.19***(.05)
Dept. Day care			.06*(.03)	-.02 (.03)	.06 (.03)	-.02 (.03)
Interactions						
Education x Job satisfaction						.06**(.02)
Education x Uniformity						.08**(.03)
Education x Client-direct.						.08*(.04)
Education x Information						.06**(.02)
Manager x Job satisfaction					.24***(.07)	.04 (.07)
Manager x Uniformity					-.00 (.08)	.11 (.08)
Manager x Client-direct.					.13 (.08)	.25*(.12)
Manager x Information					.19**(.07)	.08 (.07)
Dept. General x Job satisfaction					.17**(.07)	
Dept. General x Uniformity					.01 (.07)	
Dept. General x Client-direct.					.24***(.07)	
Dept. General x Information					.29***(.07)	
Dept. Ambulatory x Job satisfaction					.06 (.06)	-.02 (.07)
Dept. Ambulatory x Uniformity					-.24**(.07)	.17*(.08)
Dept. Ambulatory x Client-direct.					-.01 (.07)	.07 (.11)
Dept. Ambulatory x Information					-.27***(.06)	.16*(.07)
Deviance		-263.10		-286.89		-390.25
ΔDeviance (df)				23.79 (14)*[a]		103.36 (24)***[b]

Table 4B: Estimates for the hierarchical regression analysis on data of the organization for youth welfare work (standard errors between brackets). N=769

[a]Compared to Model 1; [b]Compared to Model 2. Two-tailed significance levels: * $p < .05$; ** $p < .01$; *** $p < .001$

the general department expect workload to increase as a consequence of regionalization, but they are more positive concerning the effects on job satisfaction, uniformity in work procedures and information exchange. The employees in the ambulatory department are significantly more negative on the effects on workload reduction and job satisfaction. The consequences they expect from the regionalization on uniformity and information exchange are also more negative than in other departments. Department membership explains change impact perceptions of three of the four organizational changes. This is partial support for hypothesis 1b.

Hypothesis 2 predicted a higher incidence of consonant compared to dissonant change impact perceptions, even after controlling for background characteristics. This hypothesis is supported if the CIPs of a change on different goals are positively correlated within individuals. This was tested in two steps, first we analyze whether the correlations are significant and then we analyze whether the correlations are positive. For the first step we compared the fit of Model 3 with a more restricted model in which all residual covariances are set equal to zero. For the forensic psychiatric center, the deviance of this model was 521.08, and for the organization for youth welfare work, the deviance value was 205.15. In both cases, this 'covariance-is-zero-model' provided a significantly worse fit than Model 3 ($X^2(15) = 110.36; p < .001$ and $X^2(45) = 185.11; p < .001$). Since the null-hypothesis that all covariances are zero must be rejected we conclude that the several CIPs of a change on different goals *are significantly correlated within individuals*.

Our second step was to examine whether pairs of CIPs correlate positively. To that end we scrutinize the variance-covariance matrices and the residual correlations (grey-shaded) in Tables 5A and 5B. Single intervention cognitive consonance is given if the pair-wise correlations between the causal effects of a single change are positive (the dark shaded areas in Tables 5A and 5B). *In the forensic psychiatric center* all six residual correlations are positive. The associations are particularly strong for change impact perceptions of privatization and the care program on job satisfaction and treatment quality (.61 and .68). The correlations for CIP of cost reduction on these two goals are weaker, but still positive (ranging from .16 to .22). Since all six residual

correlations between the CIPs of a single change are positive, we found support for single intervention cognitive consonance in our data of the forensic psychiatric center (hypothesis 2).

In the organization for youth welfare work twenty (dark-grey shaded) single intervention residual correlations were expected to be positive, in order to support our hypothesis concerning cognitive consonance. Of these twenty correlations, nine are over 0.30 and only three are smaller than 0.10, with a single one negative. The low correlations, including the negative correlation, are related to the CIPs on workload reduction, which have a relatively small variance (see the SD's in table 2B). Since only one of the twenty correlations has the opposite sign as expected, and most of them are quite far above zero, this result supports our hypothesis concerning single intervention cognitive consonance (the single negative correlation in 20 could easily be a chance occurrence). Employees, who expect large positive effects of a change on a subset of goals, also have the tendency to expect larger positive effects of that change on other goals. Importantly, this cognitive consonance tendency cannot be explained by background characteristics, since we have already taken those into account in our models.

We have no hypotheses concerning multiple cognitive consonance, i.e. whether individuals expecting positive consequences of one change also have the tendency to expect positive consequences of another change. However, we could analyze the existence of multiple cognitive consonance in our data by looking if the pair-wise correlations between the causal effects of different changes are positive (the light shaded area in Tables 5A and 5B). Since in the forensic psychiatric center all these correlations are also positive, there is a strong tendency towards multiple intervention cognitive consonance in this organization: employees expecting consequences of one change to be more positive also expect consequences of the other change to be more positive. Unlike in the forensic psychiatric center, the correlations between the expected effects of the regionalization and the expected effects of the IT-system are not all positive. Of the twenty light-shaded correlations in table 5B five are negatively correlated and only six have a correlation of 0.20 or higher. This means that in the organization for youth welfare work employees expecting positive

consequences of one change, do not necessarily expect positive consequences of the other change. Hence, they exhibit *multiple intervention cognitive dissonance* but no *single intervention cognitive dissonance*.

		1	2	3	4	5	6
1	CIP Privatization → Cost reduction	.12	.22	.16	.36	.11	.14
2	CIP Privatization → Job satisfaction	.04	.24	.61	.08	.27	.31
3	CIP Privatization → Treatment quality	.03	.17	.33	.26	.38	.50
4	CIP Care program → Cost reduction	.04	.01	.04	.08	.21	.18
5	CIP Care program → Job satisfaction	.02	.06	.09	.03	.18	.68
6	CIP Care program → Treatment quality	.02	.06	.12	.02	.12	.17

Table 5A: Variance-covariance matrix (diagonal and below diagonal) and residual correlations (above diagonal) for the *forensic psychiatric center*. Residual correlations between effects from the same change are shaded dark-grey. The values below the diagonal show the estimated residual covariances, variances are given on the diagonal, and the residual correlations are given in the grey shaded upper diagonal.

		1	2	3	4	5	6	7	8	9	10
1	Regionalization → Job satisfaction	.05	.16	.57	.14	.34	.08	.18	-.20	-.18	.12
2	Regionalization → Uniformity	.01	.06	.33	.03	.35	.19	.14	.11	-.06	.48
3	Regionalization → Client-directedness	.03	.02	.07	.21	.37	.35	.11	.21	.09	.26
4	Regionalization → Workload reduction	.00	.00	.01	.02	.10	-.01	.25	-.14	.31	.14
5	Regionalization → Information	.02	.02	.02	.00	.05	.17	.03	.13	.01	.12
6	IT-system → Job satisfaction	.00	.01	.02	-.00	.01	.06	.19	.43	.35	.39
7	IT-system → Uniformity	.01	.01	.01	.01	.00	.01	.06	.22	.17	.44
8	IT-system → Client-directedness	-.02	.01	.02	-.01	.01	.04	.02	.12	-.05	.23
9	IT-system → Workload reduction	-.01	-.00	.00	.01	.00	.01	.01	-.00	.03	.07
10	IT-system → Information	.01	.02	.01	.00	.01	.02	.02	.01	.00	.03

Table 5B: Variance-covariance matrix (diagonal and below diagonal) and residual correlations (above diagonal) for the *organization for youth welfare work*. Residual correlations between effects from the same change are shaded dark-grey. The values below the diagonal show the estimated residual covariances, variances are given on the diagonal, and the residual correlations are given in the grey shaded upper diagonal.

Only two significant effects were found for the control variables. In the forensic psychiatric center, male employees are more likely to perceive positive effects of the introduction of the new care program. In the youth welfare work organization, highly educated employees were more likely to perceive positive effects of the introduction of the new IT-system. In both organizations, tenure did not affect change impact perceptions.

In sum, observed CIPs are a function of both context and consonance effects. Thus, an employee's position in the organization and department membership explains her CIPs. But also, perceived effects on one outcome are positively associated with perceived effects on other outcomes, even when controlling for

position, group membership, and other socio-demographic individual background characteristics.

DISCUSSION AND CONCLUSION

Support for organizational change on the part of organization members is grounded in the perceived effects of the change on personal and organizational goals. Since such support is crucial for successful change implementation, explaining the causal cognitions of employees is of tantamount importance to organization members and scientists alike. Previous change research has mainly stressed the contextual factors affecting cognitions about and attitudes towards change, at the expense of intra-individual cognitive processes. In the current paper we propose a new theoretical framework, allowing the integration of contextual and cognitive factors affecting change attitude. Building on theories of motivated cognition, in particular goal-framing theory, and cognitive dissonance theory we contribute to answering the question of how contextual conditions and cognitive processes jointly shape attitudes to change. Based on this theoretical framework we formulate an analytical measure, *change impact perception* (CIP), accounting for both the *perceived effects* of causal conditions on goals and *the hierarchy of goals*.

We applied our framework and measure empirically in two Dutch organizations subject to organizational change, a *forensic psychiatric center* and a *youth welfare work organization*. In both of these organizations two changes were implemented. As expected (H1a) managers had more positive CIPs than did members of the workforce in all four changes. The expectation that employees from the same department have similar CIPs (H1b) was also borne out by the data. Thus, contextual factors indeed affect CIP, as predicted by our theory. This result is in line with previous studies arguing that people with similar work experience and shared goals are likely to think similarly (e.g. Hambrick & Mason, 1984; March & Simon, 1959).

Contextual factors, however, are not the whole story. As expected (H2), we found a significant positive association between the CIPs of the same respondent *after controlling for contextual factors* (and control variables), pointing to the importance of cognitive dissonance reduction in shaping CIPs. In particular, in

the forensic psychiatric center all six residual covariances were positive, whereas in the organization for youth welfare work only one out of twenty was negative. Interestingly, in the forensic psychiatric center CIPs were also positively related *across* the two changes, indicating *multiple intervention cognitive consonance*. In the organization for youth welfare work, however, these cross-change relations were mixed, with five out of twenty negative and only six over 0.20. Hence, employees in the organization for youth welfare work exhibit *multiple intervention cognitive dissonance* to some extent.

With this study we enriched the cause mapping and the organizational change literatures in several ways. First, we used goal-framing theory to link cause-effect cognitions and goal hierarchies. This linkage allows us to distinguish *multiple intervention cognitive dissonance* from *single intervention cognitive dissonance* and to separate four types of inter-personal cognitive conflict (*full cognitive consensus, goal conflict, cognitive conflict, full cognitive conflict*). Second, from our theoretical framework we derived a fine-grained measurement instrument to disentangle these different types of inter-personal cognitive conflict and intra-personal cognitive consonance. The resulting theoretical construct, "change impact perception" (CIP), represents an analytical tool that conceptualizes cognitive consonance and conflict also for future studies. Third, we developed and employed a multi-method research design combining the reliable elicitation of meaningful cause maps in real-life settings through in-depth qualitative research and the development of a standardized survey instrument to elicit cause maps in a larger population of employees.

Identification of perceived cause-effect relationships within an organization may be useful for practitioners seeking support for (or opposition against) change processes (Kwahk & Kim, 1999). The fact that besides ‘where you stand depends on where you sit’ we found that ‘where you stand *here* depends on where you stand *elsewhere*’, has important implications. On the one hand, it suggests that employees will be hard to convince of the beneficial (or detrimental) effects of a proposed change, if thus convincing them results in cognitive dissonance. On the other hand, since the perceived causal effects on several goals are positively correlated, employees altering their cognition concerning the effect on one goal might also adapt their cognition concerning

causal effects on other goals. In sum, our study suggests that the best way to affect employee cognition concerning change is via the perceived effects on the most salient goals. A prominent theoretical explanation for the fact that employees with similar organizational positions have similar cognitions is that employees within the same department or with similar hierarchical functions interact more with one another and therefore socially influence one another (Reger et al., 1994; Weick & Roberts, 1993; Bacharach et al., 1996). In the current study department and hierarchical level are only proxies for interaction. Within departments there might be subgroups that interact more with one another and will be more alike. For instance, scientists and engineers within the same R&D department had differed priority of values such as pride in work from doing job well (Shapira & Griffith, 1990). In order to properly test for the effects of social influence network data of who interacts with whom is needed.

In this study we have estimated fully multivariate models with CIPs related to several goals nested within individuals. Using random slopes at the individual level a residual variance-covariance for the CIPs results, from which one can determine the residual correlation matrix. These residual correlations indicate the degree of consonance between the individual level CIPs that is not explained by the fixed background variables (department, managerial level, gender, etc.). One should be cautious, however, with assigning positive residual correlations between CIPs related to several goals entirely to intra-personal processes of cognitive dissonance reduction. In particular, our model might have missed individual level variables relating to the cognition of employees, and adding such variables to the model could make the residual correlations decrease. However, even after accounting for arguably very relevant background characteristics (such as department, managerial position and tenure), most residual correlations between the CIPs were much larger than zero. Therefore, our study convincingly demonstrates that contextual factors and intra-personal processes of cognitive dissonance reduction jointly shape employee's attitudes towards organizational change.

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V. SILENCE IS GOLDEN*

REVEALING INFORMATION CAN INDUCE CONFLICT

ABSTRACT

Within decision making groups individuals emphasize information that is consistent with their initial preference and withhold information favoring other alternatives. Many scholars have shown that sharing only preference-consistent information can result in suboptimal outcomes, i.e. an alternative is overlooked that would be favored by all decision makers had they known all information known within the group. Less attention is given to situations in which no alternative is preferred by all decision makers even if all information would be exchanged. We theorize that if the priority assigned to the pieces of information differ among decision makers, often an optimal decision will not exist. Moreover, exchanging preference-inconsistent information can even induce or enlarge conflict if individuals have different priorities. We analyze data in which respondents had to choose between two fictional organizational changes based on information concerning the consequences of these changes. Of all pairs of respondents initially agreeing on which alternative was best, sharing only preference-consistent information would result in a suboptimal decision in 3 percent and would prevent conflict in 29 percent of the cases.

* Coauthored by Frans Stokman and Jacob Dijkstra.

INTRODUCTION

Stasser and Titus (1985) investigated pitfalls of group decision-making. They analyzed situations where all group members initially shared some pieces of information (shared information), while other pieces of information were known only to one single member (unshared information). The experiments were set up in such a way that all group members would have preferred the same 'best' alternative if they had all information, known as the *hidden profile* (Stasser, 1988). The experiments show that they often did not find the hidden profile alternative due to the fact that not all information was shared during the group discussion. The main research question in the present paper concerns whether we can get a rough estimate how often consensus on the basis of full information is expected to happen. In other words, for how many group decisions are the results of hidden profile experiments relevant?

Several subsequent hidden profile studies have replicated the results that group members talk more about information that is *shared* and is *preference-consistent* (i.e., matches their initial preference) than about information that is *unshared* and *preference-inconsistent*, leading to suboptimal group decisions (Greitemeyer and Schultz-Hardt, 2003; for reviews see e.g. Wittenbaum, Hollingshead, & Botero, 2004; Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007). The hidden profile paradigm consequently results from the fact that in the experiments unshared information is crucial in finding out which decision is best, while the participants are in favor of a suboptimal decision on the basis of the initial information. The hidden profile is not discovered due to two biases: a discussion bias, resulting in a focus on shared information, and an evaluation bias, resulting in sharing only preference consistent information (Mojzisch, Grouneva & Schulz-Hardt 2010; cf. Festinger, 1954 and Chapter 4 of this dissertation).

Group members not just bring shared information more often in group discussions than unshared information (Stasser & Titus, 1987); even after unshared information has been brought up in discussions, initially shared information is more often repeated than initially unshared information (Stasser, Taylor & Hanna, 1989; Larson, Christensen, Abbot, & Franz, 1996). In addition,

high status individuals and individuals with more task experience repeat initially shared information more often than other group members (Wittenbaum, 2000). These findings suggest that there are social costs associated in emphasizing unshared information, that social validation plays a role (Parks & Cowlin, 1996), and that 'groupthink' can rule out looking at other alternatives (Janis, 1982).

In many hidden profile experiments, group members initially agree upon a suboptimal decision before information exchange. Once the hidden profile is revealed on the basis of full information, they all agree that the hidden profile is the best decision (e.g. Stasser & Titus, 1985, 1987; Stasser, 1988; Hollingshead, 2001). In many other hidden profile experiments, members are initially *not* all in favor of the same alternative. In that setting, participants are better able to find the group's hidden profile (Brodbeck, Kerschreiter, Mojzisch, Frey, & Schulz-Hardt, 2002; Lam & Schaubroeck, 2000; Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter, & Frey, 2006), to decrease the one-sided focus on preference consistent information (Schulz-Hardt, Frey, Luthgens, & Moscovici, 2000; Schulz-Hardt, Jochims, & Frey, 2002), and to increase the amount of initially unshared information discussed (Hightower & Sayeed, 1996). While initial conflict concerning the best alternative results in fast and thorough information exchange (Parks & Nelson, 1999), groups with *at least one* member who initially prefers the 'correct alternative' are much more likely to discover the hidden profile than groups of which no member has this initial preference (Hollingshead, 1996).

All hidden profile experiments are designed in such a way that all participants prefer the same alternative when all information is shared. In the present paper we investigate how restrictive that assumption is. Not only do group members frequently disagree initially about the best alternative on the basis of partial initial information, but also in case of full information. Even if all group members know all information, these group members frequently still *disagree* about the best alternative *due to differences in goal priorities*. We will estimate how restrictive the assumption of overall agreement among group members in the full information setting is. Moreover, we will analyze the game structures in both settings.

How often holds the assumption that suboptimal outcomes are due to the fact

that group members share only part of the information? Consider the wide range of situations in which people take collective decisions. Families take collective decisions about how to spend and save, where to live, and about the distribution of household tasks. Management boards of businesses and nonprofit organizations take collective decisions about what strategies to implement. Public policies in democracies are collective decisions taken by groups of elected representatives, often after consultations with affected stakeholders. In all these contexts, collective decision-making is the process in which stakeholders have to transform their different preferences into a single collective decision that binds all actors within the social system (Stokman, Van der Knoop, & Van Oosten, 2013).

When group members need to pick one of a few alternatives, each alternative having both positive and negative characteristics, decision makers often do not possess the full information concerning all alternatives. Each decision maker will then have initial preferences over the alternatives based on his or her private initial information set. After information exchange in the group, these preferences might change. Since 'two heads are better than one' it is argued that in organizations better decisions are made in groups than individually, especially if the group members differ in expertise and knowledge. Combining expertise in a group is, for instance, assumed to result in innovative and creative new solutions (Hambrick & Mason, 1984; Legrenzi, Butera, Mugny, & Perez, 1991; Nemeth, 1986). And groups frequently outperform individuals in solving complex problems (Fraidin, 2004; Laughlin, Hatch, Silver & Boh, 2006). Notwithstanding these advantages, group decisions in, for instance, politics and organizations frequently are shown to have unintended consequences (Sato, 2006; Balogun & Johnson, 2005). Other studies show that subsets of group members sometimes perceive group decisions as suboptimal or as violating normative standards of outsiders (Kerr & Tindale, 2003). Thus, group members frequently disagree about the final decisions, even if they share full information.

Notwithstanding the attention given to initial disagreement between group members, most hidden profile research is based on two crucial assumptions with respect to group members' preferences: if all group members knew all the available information, they would all agree on a single best alternative and they

all would want the group to choose that alternative. In many real-life group decisions, however, members not only favor different alternatives prior to the discussion, they also do not necessarily strive for reaching the alternative that is best for all. In their review of the literature on hidden profiles Wittenbaum and colleagues (2004, p. 298; see also DeDreu, Nijstad & Van Knippenberg, 2008, p. 32) pointed out that *mixed motives* were missing from this literature and that it would be fruitful if in future research different interests of group members would be taken into account. In organizations, for instance, group members have many different goals (e.g. Guzzo & Shea, 1992), such as gaining status, maintaining good relations with fellow employees, and avoiding conflict, besides getting the preferred decision adopted by the group. In general, in any group decision, group members have a cooperative incentive to reach agreement and a competitive incentive to make the group decision suit their personal preferences (Pruitt, 1998; Schelling, 1960). In more recent research using hidden profiles, mixed motives have been incorporated by framing the decision task as being *cooperative*, e.g., all group members will be promoted if the best alternative is chosen, or as being *competitive*, e.g., only the individual gets promoted (Toma, Gilles, & Butera, 2013). Alternatively, differences between group members in terms of pro-social or pro-self motivations are analyzed to investigate mixed motives (Kimmerle, Wodzicki, Jaroszka, & Cress, 2011). In these studies, however, the hidden profile still contained an objectively optimal solution, since group members had to solve criminal cases (Kimmerle, Wodzicki, Jaroszka, & Cress, 2011) or had to find out who was guilty of a car accident (Toma, Gilles, & Butera, 2013). In such cases identifying the person who is actually guilty is the optimal solution according to all group members. By rewarding an individual if it finds the best solution rather than the group, competitive goals are brought into the decision process that are not in line with the cooperative goal of finding the best solution as a group. In such situations, decision makers might intentionally withhold information (cf. Morisson & Milliken, 2000).

What is currently missing from the literature cited above is another important source of conflict between group members. Not only do group members frequently initially disagree about the best alternative, based on evaluations of initial information, but also *different pieces of information* frequently *differ in*

priority for different group members. Moreover, even when all group members know all information, these *group members* frequently still *disagree* about the best alternative *due to differences in goal priorities*. In quite some hidden profile research, pieces of information are selected that are perceived as having equal priority by sets of respondents in pretests, for instance in studies in which the most appropriate job candidate has to be selected (Stasser & Titus, 1985; Greitemeyer & Schultz-Hardt, 2003; Scholten, Van Knippenberg, Nijstad & De Dreu, 2007). However, in any real-life job application process it is highly likely that not all relevant characteristics of the candidates have the same priority to every member of the selection committee and moreover, committee members will generally assign divergent priorities to these characteristics. In the search for a new secretary, for instance, some committee members might favor speed over accuracy, while for others accuracy has highest priority. If no candidate is at hand who is both the fastest and the most accurate, the committee members are in conflict even if they all know all information of the hidden profile. Or, consider a married couple that has to choose between two television sets, one pink with a large diameter and the other black with a small diameter. Even if they agree that black is more beautiful than pink and that a larger diameter is preferred over a smaller diameter, they can still very well have different preferences over the two sets due to differences in priorities concerning color and diameter.

In the next section we will use a game-theoretical framework. We consider two decision makers with partial information who have to choose between two alternatives. We derive that they are in a game with the structure of either ranked coordination or battle of the sexes (e.g. Rasmusen, 2007). We will show that, if decision makers assign different priorities to the same information, they might still have conflicting preferences in the hidden profile. We will distinguish situations where identifying the hidden profile (i.e. after exchanging all information) results either in a 'best solution' or in conflict. In the subsequent section, we describe data in which respondents gave their preferences for two types of reorganizations, based on their initial information set and on all information (the hidden profile). Using as-if analysis on all pairs of respondents with different initial information, we can analyze in how many percent of these pairs the discovery of the hidden profile would result in either reaching

agreement over which reorganization to implement or in conflict. In the final section we give a conclusion and discussion.

THEORETICAL ELABORATION

Information sharing, level of conflict and decision quality

We consider decision making in a group that has to pick one alternative from a set, in a situation where group members may differ in the priorities they assign to the characteristics of the alternatives. As in the hidden profile paradigm, each group member has a limited number of pieces of information concerning positive and negative characteristics of each alternative. No group member has all relevant information and information sets held by different group members partly overlap. The result of the group discussion, after group members have exchanged information can be (a) *conflict* (a stalemate), if the group members do not agree which alternative is best, (b) an *optimal decision*, thus a decision that is actually (i.e. in the hidden profile) optimal for all, (c) *latent conflict,* a decision that is actually optimal for some but suboptimal for other group members, and (d) a decision that is actually *suboptimal* for all. The first outcome should be avoided if an optimal outcome for all group members is possible, or if reaching no decision is seen as worse than settling for a potential suboptimal outcome. In the last three situations a decision is reached. The second outcome in which a decision is taken that is actually optimal, is best, but does not always exist since group members may have different priorities. The last outcome should be avoided. The third outcome, a latent conflict, means that once all decision makers know all information in the hidden profile, they have conflicting preferences. However, based on their initial information, or if during the group discussion some but not all information is exchanged, the decision makers might agree on which alternative is best.

We have seen that group members in hidden profile research tend to emphasize preference consistent information above sharing all information to find the best solution for all group members. Therefore, we will focus on two extreme information exchange strategies: exchanging all information or exchanging only preference consistent information in groups where group

members have different priorities for pieces of information. For both exchange strategies we investigate the outcome distributions over the four above-mentioned types of outcomes.

For ease of exposition, we consider two decision makers (One and Two) who have to reach a decision on whether to choose alternative *A* or *B*, each having some positive and some negative characteristics for the two alternatives. They also assign different priorities to the characteristics. Let there be two types of characteristics; α and β. All characteristics of one type have equal priority for a decision maker, but the decision-makers differ in the priority they give to each type. One prioritizes α over β, while Two assigns highest priorities to characteristics of type β. For ease of understanding we assign numbers representing these priorities. For One the characteristics of type α have a value of 3, those of characteristics of type β 2, while for Two this is vice versa. All combinations of characteristics are referred to as an *information set*. Thus the information set $I_A = \{\alpha_1^+, \alpha_2^+, \beta_2^-\}$ for player One means that player One knows two positive characteristics of type α and one negative characteristic of type β for alternative A. On the basis of this, Player One gives alternative A the value of $3+3-2=4$. If player Two would have this information set for alternative A, it would result in a value of $2+2-3=1$ for A.

We assume the both decision makers assign a value of zero to no decision. Let the initial information distribution (i.e. before information exchange) concerning alternative A be $\{\alpha_1^+, \alpha_2^+, \beta_2^-\}$ for One and $\{\alpha_1^+, \alpha_3^-, \beta_1^+\}$ for Two. Then they value A respectively $3+3-2=4$ and $2-2+3=3$. They have only the positive characteristic α_1^+ in common. If the initial information sets concerning alternative B are $\{\alpha_2^-, \beta_1^+, \beta_2^+\}, \{\alpha_1^+, \beta_1^+, \beta_3^-\}$ (the information set before the comma is that of One, behind the comma that of Two), the initial value of One for B is 1 and 2 for Two. This implies that both players prefer A above B on the basis of their initial information sets (as we have seen, One assigns 4 to A and 1 to B, Two assigns a value of 3 to A and 2 to B).

Assume, the hidden profile (i.e. if all information were known to both decision makers) is $\{\alpha_1^+, \alpha_2^+, \alpha_3^-, \beta_1^+, \beta_2^-\}$ for alternative A and $\{\alpha_1^+, \alpha_2^-, \beta_1^+, \beta_2^+, \beta_3^-\}$ for B. The

hidden profile for A is valued $3+3-3+2-2=3$ by One and $2+2-2+3-3=2$ by Two. The hidden profile for B is valued 2 by One and 3 by Two. Consequently, in the hidden profile One still prefers A over B, whereas Two prefers B over A.

In table 1 we present five examples of information sets in the hidden profile and initial information sets for One and Two. Situation 1 in the Table is described in the previous paragraph, namely latent conflict. The initial distribution in situation 1 corresponds to a game known as *ranked coordination* (e.g. Rasmusen, 2007, pp. 29-30). In such games there is a Pareto optimal solution, namely both supporting A; there is no outcome that is better or equally good for both players. However in the hidden profile in situation 1, the players are in conflict. One still prefers *A*, while Two prefers *B*. This game structure is often referred to as *battle of the sexes* (e.g. Rasmusen, 2007, pp. 28-29). In such games there is no outcome that is best for both players. Situation 1 in Table 1 represents a situation in which the decision makers would initially (i.e. if they would not exchange information) settle to implement *A*. If they would exchange all information and hence discover the hidden profile, Two would make up his mind, resulting in conflict over which reorganization should be implemented.

If the characteristics of the alternatives are equally important to all decision makers, the hidden profile will always have the structure of ranked coordination. However, if the decision makers assign different priorities to the characteristics, the game in the hidden profile can be a battle of the sexes, which represents a conflict of interests. Pareto optimality is lacking in a conflict of interest (Coleman, 1990, pp. 113-114), therefore suboptimal decisions do not exist if the hidden profile has the structure of a battle of the sexes.

		Initial		Hidden profile	
		Two		Two	
		A	B	A	B
1 One	A	$\{\alpha_1^+,\alpha_2^+,\beta_2^-\},\{\alpha_1^+,\alpha_3^-,\beta_1^+\}$		$\{\alpha_1^+,\alpha_2^+,\alpha_3^-,\beta_1^+,\beta_2^-\}$	
	B		$\{\alpha_2^-,\beta_1^+,\beta_2^+\},\{\alpha_1^+,\beta_1^+,\beta_3^-\}$		$\{\alpha_1^+,\alpha_2^-,\beta_1^+,\beta_2^+,\beta_3^-\}$
		Ranked coordination (*A* optimal)		Battle of the sexes	
	A	**4**,**3**	0,0	**3**,2	0,0
	B	0,0	1,2	0,0	2,**3**
2a One	A	$\{\alpha_1^+,\alpha_2^+,\alpha_4^-\},\{\alpha_3^+,\alpha_4^-,\beta_1^+\}$		$\{\alpha_1^+,\alpha_2^+,\alpha_3^+,\alpha_4^-,\beta_1^+\}$	
	B		$\{\alpha_2^-,\beta_1^+,\beta_2^+\},\{\alpha_1^+,\beta_1^+,\beta_3^-\}$		$\{\alpha_1^+,\alpha_2^-,\beta_1^+,\beta_2^+,\beta_3^-\}$
		Ranked coordination (*A* optimal)		Ranked coordination (*A* optimal)	
	A	**3**,**3**	0,0	**8**,**7**	0,0
	B	0,0	1,2	0,0	2,3
2b One	A	$\{\alpha_1^+,\alpha_4^-,\beta_1^+\},\{\alpha_2^+,\alpha_3^+,\alpha_4^-\}$		$\{\alpha_1^+,\alpha_2^+,\alpha_3^+,\alpha_4^-,\beta_1^+\}$	
	B		$\{\alpha_1^+,\beta_1^+,\beta_3^-\},\{\alpha_2^-,\beta_1^+,\beta_2^+\}$		$\{\alpha_1^+,\alpha_2^-,\beta_1^+,\beta_2^+,\beta_3^-\}$
		Ranked coordination (*B* optimal)		Ranked coordination (*A* optimal)	
	A	2,2	0,0	**8**,**7**	0,0
	B	0,0	**3**,**4**	0,0	2,3
3 One	A	$\{\alpha_1^+,\alpha_2^+,\beta_2^-\},\{\alpha_1^+,\alpha_3^-,\beta_1^+\}$		$\{\alpha_1^+,\alpha_2^+,\alpha_3^-,\beta_1^+,\beta_2^-\}$	
	B		$\{\alpha_1^+,\beta_1^+,\beta_3^-\},\{\alpha_2^-,\beta_1^+,\beta_2^+\}$		$\{\alpha_1^+,\alpha_2^-,\beta_1^+,\beta_2^+,\beta_3^-\}$
		Battle of the sexes		Battle of the sexes	
	A	**4**,3	0,0	**3**,2	0,0
	B	0,0	3,**4**	0,0	2,**3**
4 One	A	$\{\alpha_1^+,\alpha_2^+,\beta_1^+\},\{\alpha_1^+,\alpha_3^+,\alpha_4^-\}$		$\{\alpha_1^+,\alpha_2^+,\alpha_3^+,\alpha_4^-,\beta_1^+\}$	
	B		$\{\alpha_1^+,\beta_1^+,\beta_3^-\},\{\alpha_2^-,\beta_1^+,\beta_2^+\}$		$\{\alpha_1^+,\alpha_2^-,\beta_1^+,\beta_2^+,\beta_3^-\}$
		Battle of the sexes		Ranked coordination (*A* optimal)	
	A	**8**,2	0,0	**8**,**7**	0,0
	B	0,0	3,**4**	0,0	2,3

Table 1. Examples of initial information sets and the information sets in the hidden profile. The information set before the comma corresponds with player One. Number examples are given based on the situation that One assigns a priority of 3 to characteristics of type α and 2 of type β, while for player Two this is the other way around. Preferred payoffs are bold.

Just as situation 1, in situation 2a and 2b the decision makers initially agree on which reorganization is best. However, in these two situations they also have the same preference in the hidden profile. In situation 2a they both prefer *A* over *B* based on the initial information set as well as in the hidden profile, thus optimal decision will be taken even if no information is exchanged. In situation 2b, however, they initially both favor *B*, while in the hidden profile they both prefer *A*. This means they would settle for a suboptimal outcome prior to information exchange. This is even stronger the case, if they exchange only preference consistent information. If they would exchange all information both would change their preference to *A* and they would settle for the alternative that is actually the best one for both.

In situations 3 and 4 the decision makers are initially in conflict. In situation 3 they remain in conflict even when they exchange all information and consequently know the hidden profile. By exchanging preference consistent information it is possible that during the discussion one of the two makes up his mind (e.g. after Two hears that *A* also has positive characteristic α_2^+ his preference might shift to *A*) and is persuaded to an alternative he would not prefer had he known all information of the hidden profile. Also in situation 4 they are initially in conflict, but now decision maker Two would change preference knowing the hidden profile. Exchanging all information results in an optimal decision for both. If they would exchange preference consistent information there is a chance that Two persuades One to agree on the suboptimal decision *B* (although this is highly unlikely in the given example).

As said, respondents are often observed to emphasize preference consistent information instead of sharing all information, while the latter might lead to optimal decisions (see e.g. Wittenbaum, Hollingshead, & Botero, 2004; Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007). We have pointed out that such optimal decisions not always exist, namely if priorities differ between decision makers. Therefore emphasizing preference consistent information can be rational, namely in order to prevent others to make up their mind, while they supported a change that one prefers.

We will now compare two strategies of information exchange: exchanging all information versus exchanging only preference consistent information[1]. Table 2 gives an overview in which situations these information exchange strategies result in *conflict*, in *optimal decisions for both*, in *suboptimal decisions for both* or in a decision that is *optimal for one of the two*.

	Initial distribution	Hidden profile	Strategy of information sharing	Decision reached	Decision quality
I	Ranked coordination	Battle of the sexes	All information	No	
			Preference consistent	Yes	Optimal for one decision-maker, suboptimal for other
II	Ranked coordination	Ranked coordination	All information	Yes	Optimal
			Preference consistent	Yes	Optimal if initial preference is optimal, otherwise suboptimal
III	Battle of the sexes	Battle of the sexes	All information	No	
			Preference consistent	Possibly	Optimal for one decision-maker, suboptimal for other
IV	Battle of the sexes	Ranked coordination	All information	Yes	Optimal
			Preference consistent	Possibly	If decision is reached, the quality depends on who convinced whom

Table 2. Overview of the result of strategy of information sharing depending on initial and final information distributions.

Situation I represents the situation that has been neglected in the hidden profile literature, namely that sharing all information results in conflict (no decision), whereas decision makers are able to arrive at a shared alternative on the basis of their initial information. If decision makers think they might be in a battle of the sexes game (i.e. in conflict) in the hidden profile and want to prevent a stalemate (thus even prefer a possible suboptimal decision over possible conflict), sharing preference consistent information is the best strategy in that situation.

Situation II in Table 2 corresponds to the extensive body of research using hidden profiles (e.g. Stasser & Titus, 1985; Greitemeyer & Schultz-Hardt, 2003; Scholten, Van Knippenberg, Nijstad & De Dreu, 2007) where initial preferences

[1] Of course intermediate strategies exist. Instead of exchanging all information or only preference consistent information, they might exchange preference consistent information and also bring up some preference inconsistent information in order to pretend open-mindedness. However, the two extreme strategies are observed frequently.

were specified as not optimal. In experiments many group decisions ended up suboptimal, because group members frequently followed preference consistent strategies rather than full information strategies. In such situations sharing all information is better, since it certainly results in the optimal decision.

Situation III in Table 2 shows that conflict on the basis of the initial information might coincide with conflict in the hidden profile as well. In that situation, exchanging full information does not help. Situation IV is the opposite of Situation I: no agreement can be obtained on the basis of the initial information, whereas a Pareto optimal outcome can be realized under the hidden profile. If there is initial conflict, then sharing all information among all group members is the best alternative.

The situations I to IV are related to the distinction between *cognitive conflicts* and *goal conflicts*. If the hidden profile is of type ranked coordination, there is agreement between decision makers about the goals (Situations II and IV). If on the other hand the hidden profile is of type battle of the sexes, there is likely goal conflict (Situations I and III). If initial information distribution is of type battle of the sexes and the hidden profile is of type ranked coordination (Situation IV), we clearly deal with a cognitive conflict rather than a goal conflict (chapter 2 of this dissertation and Hammond, Tood, Wilkins, & Mitchell, 1966; Deutsch, 1977; McGrath, 1984). In Situation III we deal with a goal conflict if the initial information distribution results in the same outcome as the hidden profile; if not we have to do with both a cognitive and a goal conflict. If in the hidden profile the preferences of both decision makers are opposite to their initial preference, the one that is persuaded to switch is actually best off. If in the hidden profile decision makers' preferences are the same as initially, then the decision maker that persuades the other to change positions is best off.

Summarizing, if decision makers know that their goal ranking is congruent and hence are in a game of ranked coordination in the hidden profile, sharing all information is the best strategy, since it will result in the optimal decision. However, if their goal rankings are not aligned, they are in game of battle of sexes in the hidden profile, resulting in a stalemate under full information exchange. In order to prevent stalemate, sharing only preference consistent information might convince the other to change preference, resulting in ranked

coordination for a (possibly suboptimal) decision on the basis of partial information.

As the hidden profile literature is confined to the Situations II and IV, we would like to know how relevant Situations I and III, in which decision makers are in conflict based on complete information, are in real life situations. Therefore, we designed a study to estimate the probabilities of occurrence of each of the situations in Table 1 and 2 on the basis of a study in which respondents had to choose between two reorganizations, based on both initial information sets and on the hidden profile. By considering all possible pairs of decision makers with initially different information sets, we can calculate the probabilities of occurrence for each of the situations in Table 1 and 2.

If reorganization A will be implemented…	I	II
… *employees will get more equal opportunities (for instance for promotion)*		+
… *you will get less influence on organizational policies*		-
… *you will be supervising more people*	+	
… *there will be less time to help one another*	-	
… employees' personal circumstances will be taken less into account in assessments	-	-
… you will get more freedom you shape your own projects	+	+
… your income will raise	+	+
If reorganization B will be implemented…		
… *employees will get more equal opportunities (for instance for promotion)*	+	
… *you will get less influence on organizational policies*	-	
… *you will be supervising more people*		+
… *there will be less time to help one another*		-
… the personal circumstances of employees will be taken more into account in assessments	+	+
… you will get less freedom you shape your own projects	-	-
… there will be less conflicts between departments, including your department	+	+

Table 3. Pieces of information in the hidden profile and in the initial information sets I and II. Pieces of information that hold for both reorganizations are italic.

DATA

The reported data are obtained from 83 Sociology freshmen of the University of Groningen, collected as part of a research experience requirement. The students had to fill in a questionnaire after they received information concerning the consequences of two reorganizations *A* and *B*. The data are, therefore, not based on face-to-face or computer-mediated discussions. First, initial information about two types of reorganizations was given after which they had to give their initial preference. Subsequently, they were asked which information they would

emphasize most in a discussion. In the next step, the hidden profile was presented, followed by a question about their preference on the basis of the hidden profile (cf. Greitemeyer & Schulz-Hardt, 2003; Toma, Gilles, & Butera, 2013). Finally we also asked how important the pieces of information were to them.

The hidden profile of the two reorganizations consists of seven elements, given in Table 3, namely four positive characteristics and three negative ones per reorganization. The respondents received first one of two initial information sets (I or II), also specified in Table 3. Both initial information sets consisted of two negative and three positive pieces of information for each type of reorganization.

After respondents read the initial information set, they were asked to put themselves in the place of employees that worked in the organization where one of these two reorganizations was going to be implemented. They were asked which reorganization they preferred and had to assign the number 100 to that reorganization. Then they had to assign a number between 0 and 100 that indicated how much less they preferred the other reorganization.

After all information in the hidden profile was presented, again the relative preferences for A and B where asked by assigning numbers from 0 to 100. Finally the respondents were asked to assign priorities to the eight characteristics, again with 100 for the characteristics with highest priority and 0 to 100 indicating the relative priority of the other characteristics. See table 4 for a translation of the phrasing of this question.

ANALYSIS

First, we compare preferences between the two types of reorganizations on the basis of the scores the respondent gives to each of them (100 for the most preferred and a score between 100 and 0 for the other). For each respondent, we have two of these scores, one for the initial information set and one for the hidden profile. We will refer to the preference numbers for reorganization A based on respectively the initial information and the hidden profile as $PN_{A,i}$ and

Finally indicate for the following goals how important they are to you. It might be that all goals are important, but some might be more important than others. Read the list and assign the number 100 to the goal that is most important to you. Then assign a number between 0 and 100 indicating how less important those goals are to you. You are allowed to assign the same number to more goals, if they are equally important to you. The number 0 would mean that a goal is totally irrelevant to you.	
Supervising many people	
A high **income**	
Lots of **freedom** to shape own projects	
Much **influence** on organization policy	
Equal **opportunities** for employees (e.g. promotion)	
Few **conflicts** between employees	
Take into account **personal** circumstances	
Having much time to **help** others	

Table 4. Question for the priority of each of the goals. In this chapter the goals are referred to using the bold words (in the questionnaire these words weren't bold).

$PN_{A,hp}$. The preference strength for reorganization A to B can now be defined as the difference between the preference numbers for the two reorganizations, e.g. based on the initial information set as: $PS_{A,i} = PN_{A,i} - PN_{B,i}$. If this is a positive number, the respondent prefers A to B, if it is negative the preference is B to A. For instance if a respondent assigned 100 to *A* and 70 to *B* on the basis of the initial preference set, the preference strength is $PS_{A,i} = 100 - 70 = 30$. Higher positive preference strength indicates a stronger preference for A.

In the above calculations we did not yet consider the given priority scores for the seven characteristics. The higher the priority of the positive characteristics and the lower the priority of the negative characteristics of reorganization A are for a respondent, the more likely this reorganization will be favored by the respondent. Furthermore, if the negative characteristics of B have a high priority, the preference strength for reorganization A will likely increase. In order to test whether our logic holds, we have computed a measure for how much A is *expected* to be preferred, based on the summation of the priorities of the pieces of information, taking into account whether these pieces of information are positive or negative characteristics of A and B. If for example there are four characteristics, a positive one of A having priority 75, a negative one of A with priority 80, a positive one of B with priority 70 and a negative one of B with priority 100, the expected preference strength for A to B would be

$75+100-80-70=25$ (i.e. A is preferred over B). More generally, we define the expected preference for reorganization A (EP_A) as:

$$EP_A = \sum_{i\in\{A_+\cup B_-\}} p_i - \sum_{j\in\{A_-\cup B_+\}} p_j \quad (1)$$

where p_i denotes the priority assigned to characteristic *i* (for instance $p_{influence}$ denotes the priority assigned to having influence); A_+ denotes the set of all positive characteristics of reorganization *A*.

From table 3 it follows that the initial information set I contains three positive characteristics of A and of B ($A_{I,+}=\{supervising, freedom, income\}$ and $B_{I,+}=\{opportunities, personal, conflicts\}$), and two negative characteristics of both A and B ($\left(A_{I,-}=\{help, personal\}\right)$ and $B_{I,-}=\{influence, freedom\}$). Thus $EP_{A,I} = p_{supervising} + 2\cdot p_{freedom} + p_{income} + p_{influence} - p_{help} - 2\cdot p_{personal} - p_{opportunities} - p_{conflicts}$. The expected preferences for *A* for respondents with information set II are calculated similarly. We expect PS_A and EP_A to correlate and to have the same sign; both positive means a preference for *A* and both negative means *B* is preferred. In the result section we will show that these measures indeed correlate.

Subsequently, we will conduct an as-if analysis on all possible pairs of respondents of which one received initial information set I and the other information set II. We can compute how many of these pairs have the same or conflicting preferences based on their initial information set and based on their preference once the hidden profile is revealed.

RESULTS

Since our aim is to use characteristics with different priority to respondents, we based our characteristics in table 4 on egoistic and collective values used in environmental studies of De Groot and Steg (2008). In table 5 the descriptives and correlations of the goal priorities are given. We conclude both on the basis of the means and standard deviations that respondents indeed assigned different priorities to the goals. As expected we find positive correlations among the four

egoistic goals (supervising, income, freedom and influence) and among the collective goals (opportunities, conflicts, personal and help) and predominantly negative ones between the two sets.

	Goal	M	SD	1	2	3	4	5	6	7
1	Supervising	56.36	28.22							
2	Income	72.72	24.52	.32**						
3	Freedom	86.92	19.29	.23*	.15					
4	Influence	69.26	22.15	.27*	.22*	.36**				
5	Opportunities	80.10	18.42	-.13	.17	-.03	.11			
6	Conflicts	80.48	16.92	-.16	.14	-.31**	.06	.19		
7	Personal	69.38	27.34	-.23*	.14	-.23*	.03	.31**	.38***	
8	Help	66.14	22.25	.01	.21	-.07	.22*	.31**	.46***	.54***

Table 5. Descriptives and Pearson correlations of the priority of the eight goals.
N=83. * $p < .05$; ** $p < .01$; *** $p < .001$

The preference for the type of reorganization shifted for 19 of the 83 respondents between the initial information set and the hidden profile condition. One respondent initially preferred B to A, but was ambivalent in the hidden profile (see table 6).

As table 6 shows, respondents differ in their preferences for reorganization A vs. B both in the hidden profile and among respondents that received the same initial information set. We expect these differences to be due to the fact that respondents assign different priorities to the characteristics of the two reorganizations. In order to test this, we will analyze whether our measures for EP and PS are positively correlated and have equal sign.

		Preference in hidden profile						
		A		Equal		B		
	Info set	I	II	I	II	I	II	Total
Initial preference	A	16	28	0	0	3	4	51
	B	11	1	1	0	13	6	32
		27	29	1	0	16	10	83
	Total	56		1		26		

Table 6. Crosstab of initial preferences and preferences in the hidden profile.

Test whether preference differences are due to priority differences

We first consider the differences between the two initial information sets. If the expected preference for A is positive we expect that the respondent initially prefers A to B. If the expected preference for A is negative, we expect that B is initially preferred. Thus we expect $EP_{A,i}$ $(M = 26.59; SD = 93.15)$ and $PS_{A,i}$

$(M = 7.45; SD = 29.76)$ to be positively correlated and to have the same sign (both being negative, both being zero or both being positive). The correlation between those variables is indeed high and positive $(r = .71; p < .001)$. Furthermore, the left scatterplot in Figure 1 and the crosstab in Table 7 show that our expected preferences for *A* or *B* are indeed a good predictor of the actual preference $(\mathrm{X}^2(2) = 50.65, p < .001,\ Crámer's\ V = .78)$.

			Expected preference			
			$EP_{A,i} > 0$	$EP_{A,i} = 0$	$EP_{A,i} < 0$	
			A	Equal	B	
Actual preference	$PS_{A,i} > 0$	A	46	1	4	51
	$PS_{A,i} < 0$	B	4	1	27	32
			50	2	31	83

Table 7. Crosstab comparing actual preference with expected preference.

In order to analyze how the preferences of respondents changed from their initial preference into their preference in the hidden profile (based on four more characteristics than their initial information set), we calculated their preference change $\Delta PS_A = PS_{A,hp} - PS_{A,i}$. A positive value of ΔPS_A implies an increase of the preference for reorganization A after receiving all information. This implies that the respondent either already preferred A initially and the full information strengthened that preference or that the respondent initially preferred B and the full information weakened that preference or even changed it in a preference for A. We calculated the expected change in preference strength (ΔEP_A) by filling in the priorities of the four pieces of extra information into formula (1). We found that ΔPS $(M = .83, SD = 54.34)$ and ΔEP_A $(M = 2.58, SD = 25.47)$ also correlated positively $(r = .40, p < .001)$. The crosstab in Table 8 also shows that our expected preferences for *A* or *B* indeed are a good predictor of the actual preference $(\mathrm{X}^2(4) = 20.79, p < .001,\ Crámer's\ V = .35)$. See also the right scatterplot in Figure 1. The dots are expected to be in the upper-right and lower-right quadrants. Compared to the left scatterplot, in the right scatterplot more dots are in the 'wrong quadrants', but still a large majority is predicted correctly. Maybe respondents' preference change becomes smaller if it is based on an extra piece of information, while they already had quite some information.

		Expected preference change			
		$\Delta EP_A < 0$	$\Delta EP_A = 0$	$\Delta EP_A > 0$	
Actual preference change	$\Delta PS_A < 0$	25	8	8	41
	$\Delta PS_A = 0$	1	0	0	1
	$\Delta PS_A > 0$	8	6	27	41
		34	14	35	83

Table 8. Crosstab comparing actual preference with expected preference.

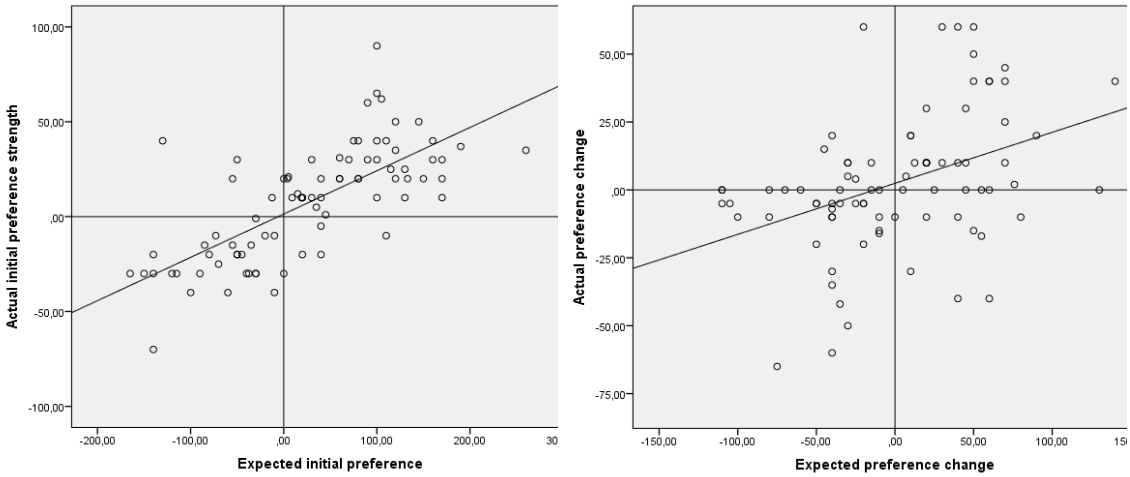

Figure 1. Scatterplots with $EP_{A,i}$ and $PS_{A,i}$ (left) and with ΔPS_A and ΔEP_A (right).

As-if analysis

Now we consider situations in which two decision makers have to reach a decision over whether to implement reorganization A or B and what the results would be if they would both share all information or if they would both share just preference consistent information. Since pairs of decision makers with the same initial information set cannot exchange new information and are, therefore, not able to discover the hidden profile, we consider only pairs of respondents for which the initial information sets of the decision makers differ.

In our data, 44 respondents have information set I and 39 information set II, thus there are $44 \cdot 39 = 1716$ of such pairs. From Table 6 we calculate that $16 \cdot 4 = 64$ of these pairs initially both preferred A but in the hidden profile the ones with information set II shifted their reference to B. Similarly in $3 \cdot 28 = 84$ pairs the one with information set I prefers B in the hidden profile, while initially they both preferred A. Of the pairs that initially both supported B in total in $13 \cdot 1 + 11 \cdot 6 = 79$ pairs one of the two shifted their preference in the hidden

profile to A. This means that in total in 13.2 percent of all pairs conflict would be created if all information is shared, although initially they favored the same alternative ($\frac{16\cdot4++3\cdot28+13\cdot1+11\cdot6}{1716} = \frac{227}{1716} = 0.132$). This corresponds to situation 1 in Table 1.

Similarly we can compute the pairs of respondents that initially agreed on either A or B and have the same preference in the hidden profile. Whether they communicate all information or only preference consistent information makes no difference, they always reach the decision that is optimal for both. We assume that the one respondent with information set I that initially preferred B but was indifferent in the hidden profile, will agree to implement B both initially and in the hidden profile in the six pairs of respondents with preferences for B both under the initial information set II and under the hidden profile. This means that 31 percent of all pairs ($\frac{13\cdot6+16\cdot28+1\cdot6}{1716} = \frac{532}{1716} = 0.310$) both initially agree on what is the best reorganization and stick to that preference in the hidden profile (2a in Table 1). Another possibility for pairs that initially agreed is that both shifted their preference in the hidden profile (2b in Table 1). In such situations they would reach consensus on a suboptimal solution if they would share only preference consistent information, while sharing all information would lead to agreement on a better option. We find this situation in 1.4 percent of all pairs. This includes the pair that initially agreed on reorganization B, but one of them shifted towards A while the other became indifferent.

Still two situations have to be investigated. The first one is where the two remain in conflict in the hidden profile (situation 3 in Table 1). The other is the situation where the two are initially in conflict but agree that one reorganization is to be preferred in the hidden profile (i.e. one of them shifted preference; situation 4 in Table 1). These situations occur in respectively 29.5 and 24.8 percent. In the former case the conflict remains, independent which information sending strategy is used. In the latter case sending all information would resolve the initial conflict.

We are interested in how often in our data decision makers that are initially are either in conflict or in consensus, will agree on the optimal outcome or be in

conflict, after they have exchanged all information. Therefore we will calculate the conditional probabilities of reaching consensus given the initial state of conflict or consensus.

We give these conditional probabilities in Table 9. We refer to the 42.8 percent of pairs that have conflicting preferences in the hidden profile as being in a Battle of Sexes game in the hidden profile. In such a game consensus is always optimal for one decision maker and suboptimal for the other. The 57.2 percent that have the same preference in the hidden profile are considered to be in a game of Ranked Coordination, in which consensus can be reached on the alternative that is optimal for both (and in which suboptimal consensus exists).

Based on initial preferences, 54.4 percent of the pairs was in conflict and 45.6 percent agreed which reorganization was to be preferred. Given initial conflict, the conditional probability of reaching consensus by sharing all information, i.e. reaching consensus in the hidden profile, is 45.7 percent. The conditional probability of remaining in conflict, given initial conflict, is thus 54.3 percent. If decision makers are initially in conflict and only share preference consistent information, we do not know whether this results in (sub)optimal consensus or conflict (see also III and IV in Table 2). During the information exchange one of the decision makers might change preference.

Given initial consensus (I and II in Table 2), 71 percent of the pairs will make an optimal decision if they exchange all information. However, by

		Hidden profile				
	Result	Ranked coordination (57.2%)			Battle of sexes (42.8%)	
	Information sending	Suboptimal consensus	Optimal consensus	Conflict	Consensus	Conflict
Initial conflict (54.4%)	Pref. consistent	?	?	?	?	?
	All	0%	**45,7%**	0%	0%	**54,3%**
Initial consensus (45.6%)	Pref. consistent	**2,9%**	**68,1%**	0%	**29%**	0%
	All	0%	**71%**	0%	0%	**29%**

Table 9. Conditional probabilities of reaching (sub) optimal consensus or conflict if preference consistent information is shared or if all information is shared, conditional on whether there is initial conflict or consensus. The bold percentages result from our data concerning the reorganizations A and B (N=1716 pairs).

exchanging all information, the other 29 percent will end up in conflict. If on the other hand, they exchange only preference consistent information given initial consensus, still 68.1 percent will make an optimal decision and only 2.9 percent will end up with a decision that is actually suboptimal for both. On the other hand, by only exchanging preference consistent information in a situation of initial consensus, conflict is prevented in 29 percent of the cases.

DISCUSSION

In this paper we focused on information exchange between decision makers that assign potentially different priorities to the pieces of information. We have both theoretically and empirically shown that such decision makers can have conflicting preferences, based on the same information, due to priority differences.

A large body of literature on hidden profiles was devoted to explaining why decision makers often reached 'suboptimal decisions' by emphasizing preference consistent information (e.g. Stasser & Titus, 1987; Wittenbaum, Hollingshead, & Botero, 2004; Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007). Crucial element in most hidden profile studies was that an optimal decision existed in the hidden profile, i.e. all decisions makers would prefer one and the same alternative, had they known all information available in the group of decision makers. We have argued that in many real-life situations such a unanimously supported optimal decision does not exist. Exchanging just preference consistent information might make sense in situations where full information exchange might result in conflict, even when it might lead to a 'suboptimal' decision. Explanations for the exchange of mainly preference consistent information are that in most experiments the preference consistent information was shared among more decision makers and therefor it was more likely that it was brought up into a discussion. Furthermore there are social costs of mentioning unique information (Stewart, 1998; Stasser & Titus, 2003; Wittenbaum, Hollingshead, & Botero, 2004). In the literature, avoiding conflict as ground for exchange of just preference consistent information is lacking.

In our data, only 2.9 percent of the pairs of decision makers that initially supported the same alternative actually arrived in a suboptimal alternative on

the basis of preference consistent information exchange, while this situation receives most attention in the hidden profile literature. Neglected in the hidden profile literature is that 68.1 percent of these pairs would still arrive at the optimal outcome and that even 29 percent of these pairs would be in conflict had they shared all information. If on the other hand there is initial conflict, only 45.7 percent reaches optimal consensus in the hidden profile situation on the basis of full information exchange, whereas 54.3 percent remains in conflict.

Our findings have implications for the formation of decision groups in for instance organizations. Information exchange is associated with creative and innovative solutions (Legrenzi, Butera, Mugny, & Perez, 1991; Nemeth, 1986) and therefore groupthink (Janis, 1982) should be prevented in order to solve complex problems (Fraidin, 2004; Laughlin, Hatch, Silver, & Boh, 2006). In such groups all information should be exchanged and should result in a decision. If the goal priorities within a group of decision makers are aligned, no conflict will exist in the hidden profile and they are likely to exchange all information and discover the optimal solution. In such a group a culture should be created in which all information is exchanged, included preference inconsistent information, in order to prevent groupthink. Literature indicates that in groups more information is exchanged if there is initial conflict (see for an overview Wittenbaum, Hollingshead, & Botero, 2004). However if the initial conflict is due to differences in priorities, all information might be exchanged but conflict can still remain. In order to promote reaching optimal decisions, initial conflict should result from different pieces of information (i.e. based on different expertise), rather than from differences in priorities. The latter is in line with findings that decision making groups with a so-called 'transactive memory', i.e. groups in which responsibility for specific information is assigned to certain members of the group, make better decisions, if members know who is knowledgeable about what (Wegner, 1987; Van Ginkel, & Knippenberg, 2009). When information on a specific topic is needed, the group turns to the expert for this information. However, if the experts assign different priorities to pieces of information, sharing all information still does not have to be optimal for them personally. Decision groups in which information is distributed over the members, but in which the members priorities are aligned, are likely to make

best decisions, since there is no incentive to strategically withhold information (Bonacich, 1987) and because a lot of information is considered during information exchange.

Our current research is the first study on hidden profiles in which we deliberately used pieces of information that were likely to differ in priority among respondents. We have chosen eight pieces of information, based on items from scales measuring egoistic and collective values (De Groot & Steg, 2008). As expected, for some respondents the four collective values were relatively more important than for others. Only the 'egoistic' value of having more freedom to shape ones own projects, was given high priority overall. For studying the effect of different priorities choosing information based on different value scales, seems to be fruitful.

We have now used questionnaires to ask the preferences of respondents and we have performed as-if analysis in which we selected pairs of respondents and calculated the portions of pairs that would remain in conflict, resolve conflict, created conflict or remain in consensus, if all information would be shared. In order to analyze how groups actually exchange information, experiments in which groups actually exchange information (face to face or via a digital chat) are needed. In order to test whether our suggestion that decision makers are more likely to share all information if their priorities are aligned and share more preference consistent information if the priorities differ, experiments are needed in which the priorities of the group members are being made public.

In our current study we have focused on one topic on which a decision had to be made. In such situations a stalemate is likely to result in reaching no decision. If however, decision makers have to reach consensus on several issues (simultaneously or over a period of time), they are in a bargaining situation in which they can give and take. Then they might settle for personally suboptimal decisions on one issue in exchange for a personal optimal decision on another issue (cf. Arregui, Stokman, & Thomson, 2004; Stokman, Van der Knoop, & Van Oosten, 2013). If the priorities of decision makers are aligned, complete information exchange will result in consensus on all issues. However, if the priorities differ and decision makers are initially in conflict, bargaining could be a more fruitful strategy than information exchange in order to reach consensus.

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SUMMARY IN DUTCH / SAMENVATTING IN HET NEDERLANDS

INLEIDING

Veranderingen in organisaties worden vaak door een deel van de medewerkers gesteund, terwijl een ander deel ertegen is. De veranderingen worden ingevoerd omdat ze volgens sommige medewerkers positieve gevolgen zullen hebben. Ze zullen leiden tot het behalen van enkele doelen (Cyert & March, 1963; Katz & Kahn, 1978; Balogun & Johnson, 2004), zoals kostenbezuiniging, kwaliteitsverhoging of werkdrukverlaging. Medewerkers verschillen echter in de mate waarin een organisatieverandering zal bijdragen aan het behalen van die doelen (Weick, 1979; Sims & Gioia, 1986; Walsh, 1995). Bovendien verschillen medewerkers in welke doelen ze het belangrijkst vinden (Dearborn & Simon, 1958; Bourgeois, 1980). Voor de een is de hoeveelheid output, zoals meer producten kunnen maken of meer cliënten kunnen helpen, belangrijker dan de kwaliteit van die output. Voor de ander is kwaliteit belangrijker dan kwantiteit. Zeker wanneer een verandering naast de beoogde positieve effecten ook negatieve bijeffecten heeft op andere doelen, zal niet elke medewerker de verandering steunen.

Doelprioriteiten, cognities en conflict

In dit proefschrift analyseren we de individuele *cognities* van medewerkers over de gevolgen van reorganisaties. De cognitie is dus het geheel van inschattingen over de mate waarin een reorganisatie positief of negatief zal bijdragen aan bepaalde doelen. We houden ook rekening met de belangen die men toekent aan die doelen, hun *doelordeningen*. We nemen aan dat de *houding* van medewerkers tegenover veranderingen, dus de mate waarin ze de verandering steunen of er weerstand tegen hebben, afhangt van hun cognitie en doelprioriteiten. We introduceren een maat voor het *totale effect* van een verandering, op basis van de cognitie en doelordeningen. Uit onze analyses met data over concrete reorganisaties, blijkt dat dit totale effect een goede voorspeller is van de houding van medewerkers tegenover de verandering.

Onze focus ligt op het analyseren van de cognitie van medewerkers over de gevolgen van organisatieverandering en op hun houding tegenover die verandering. In veel theorieën wordt verondersteld dat die relatie er is, maar deze theorieën (en empirische bevindingen) zijn deels tegenstrijdig. Zo is er gesteld dat reorganisaties succesvoller zijn als de cognitie van het management en medewerkers meer op elkaar lijken (Reger et al., 1994; Labianca et al., 2000; Bartunek, 1984; Isabella, 1990) en reorganisaties mislukken als de cognities grote verschillen vertonen (Markóczy, 2001). Hierin is de impliciete aanname dat dezelfde cognitie leidt tot dezelfde houding tegenover de verandering. Aangezien gezamenlijke steun voor de verandering leidt tot succesvollere invoering van de verandering (Gioia & Sims, 1996), zouden gedeelde cognities dan nodig zijn voor succesvolle organisatieveranderingen. Verschillen in cognities tussen medewerkers hoeven echter niet altijd tot verschillende houdingen ten opzichte van de reorganisatie te leiden. Twee medewerkers kunnen op basis van verschillende cognities beiden de reorganisatie steunen (Wittenbaum, Hollingshead, & Botero, 2004). Wanneer mensen dezelfde verandering steunen, op basis van verschillende cognities, bestaat echter de kans dat ze een alternatief dat volgens iedereen beter is, over het hoofd zien (Stasser & Titus, 1985; Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007). Anderen stellen dat verschillende cognities zullen leiden tot verschillende houdingen tegenover veranderingen, waardoor er meer gediscussieerd zal worden. Verschillende cognities tussen medewerkers resulteren dan juist in innovatieve en kwalitatief betere organisatieveranderingen (De Dreu, 2006; Jehn & Mannix, 2001; Mooney, Holahan & Amason, 2007; Tjosvold, 2008). Daartegenover staan theorieën die stellen dat als medewerkers dezelfde cognitie hebben, ze makkelijker besluiten zullen nemen die door iedereen gesteund worden, waardoor de organisatie beter zal presteren (Cannon & Edmondson, 2001).

Kortom, in de literatuur zijn verschillen in cognities tussen medewerkers gerelateerd aan zowel mislukte, suboptimale als juist kwalitatief betere organisatieveranderingen. Condities wanneer cognitieve verschillen tussen medewerkers positieve gevolgen zullen hebben en wanneer ze negatieve gevolgen zullen hebben, zijn niet duidelijk. Een verklaring voor de tegenstrijdige bevindingen over de relatie tussen cognitieve verschillen onder medewerkers en

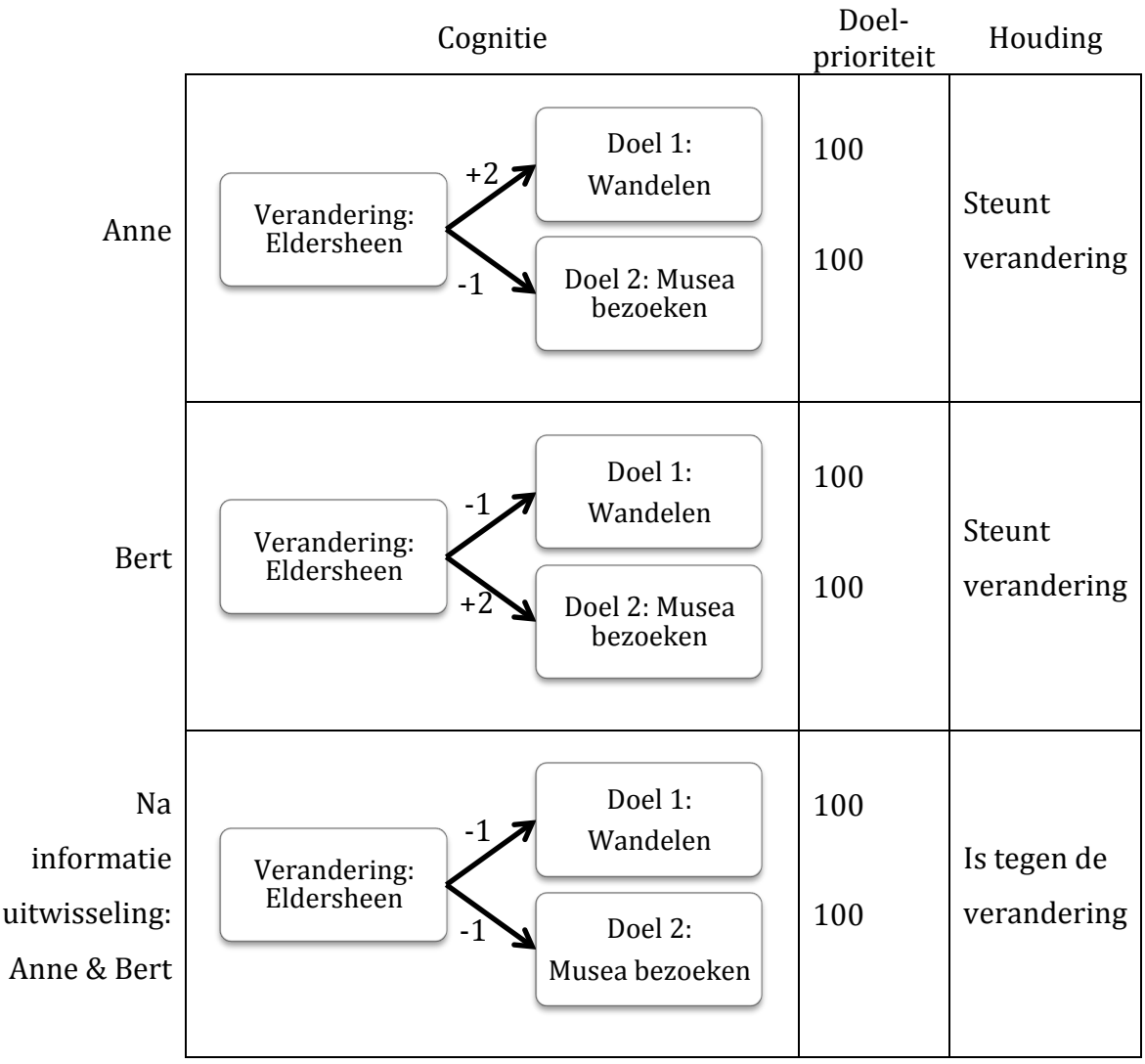
het succes van organisatieveranderingen, kan liggen in het feit dat cognities (en cognitieve verschillen) op verschillende manieren gemeten zijn en dat de relatie tussen cognitie over de gevolgen van een organisatieverandering en de houding ten opzichte van die verandering, niet helder onderzocht is. Wij laten zien hoe we met zogenaamde 'cognitieve map' data (Axelrod, 1976; Eden, Ackerman & Cropper, 1992) en de doelordeningen goede inschattingen kunnen maken van iemands houding. Vervolgens kunnen we analyseren welke veranderingen in cognities zouden leiden tot meer overeenstemming tussen medewerkers over de wenselijkheid van een reorganisatie.

In dit proefschrift onderscheiden we drie cruciaal verschillende situaties waarin individuen dezelfde cognitie of doelordening hebben of juist uiteenlopende cognities of doelordeningen. Zo kunnen ze dezelfde houding hebben op basis van verschillende cognities en doelordeningen, verschillende houdingen hebben op basis van (met name) verschillende cognities of verschillende houdingen hebben op basis van (met name) verschillende doelordeningen. Aan de hand van drie voorbeelden lichten we deze situaties toe. Vervolgens leiden we de onderzoeksvragen in, geven we aan hoe wij cognitieve data verzameld hebben en geven een samenvatting van elk hoofdstuk. We sluiten af met een discussie en conclusie.

Voorbeeld I: Vakantiebestemming, geen conflict, verschillende cognitie

Anne en Bert zijn op vakantie. Ze houden beiden van wandelen en musea bezoeken en vinden beide activiteiten even belangrijk. Ze kunnen doorreizen naar Eldersheen of op hun huidige camping in Stastil blijven. Anne denkt dat er ten opzichte van Stastil in Eldersheen meer wandelroutes zijn en bijna evenveel musea. Ze zou daarom door willen reizen naar Eldersheen, in andere woorden, ze steunt de verandering. Bert denkt dat er in Eldersheen minder wandelroutes zijn, maar dat er veel meer interessante musea zijn dan in Stastil. Daarom wil hij ook doorreizen naar Eldersheen. Echter, als ze hun argumenten zouden uitwisselen waarom ze beter in Stastil zouden kunnen blijven, zou Anne inbrengen dat enkele musea in Eldersheen vanwege verbouwingen niet toegankelijk zijn en Bert zou vertellen dat enkele wandelroutes afgesloten zijn vanwege het broedseizoen. Dit wetende zouden ze beiden denken dat er zowel

minder wandelroutes en minder bezoekbare musea zijn in Eldersheen en zouden ze beiden tegen de verandering zijn en in Stastil willen blijven. Als ze echter geen informatie zouden uitwisselen, dan zouden ze naar Eldersheen zijn gegaan en een suboptimale beslissing hebben genomen.

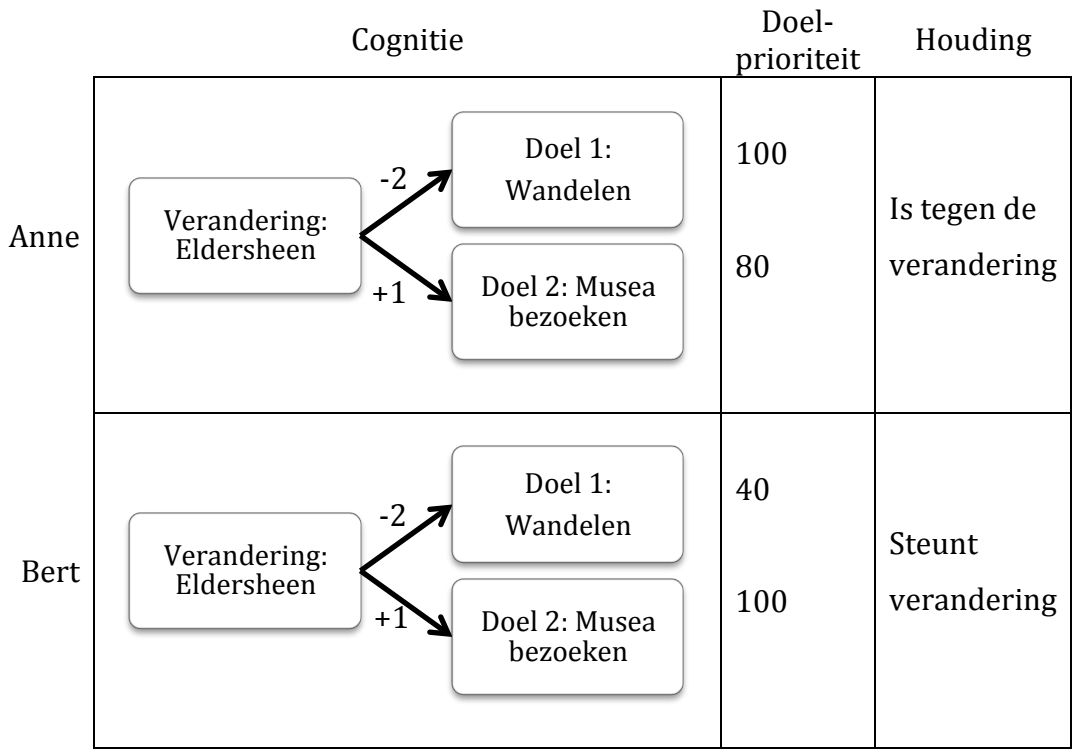


Figuur 1: Cognitie, doelprioriteiten en houdingen uit voorbeeld I.

Bovenstaand voorbeeld is uitgewerkt in figuur 1. De cognitie is weergegeven als een simpele gewogen 'cognitieve map' (Axelrod, 1976; Eden, Ackerman & Cropper, 1992). De pijlen stellen causale relaties voor met gewichten van -3 t/m 3, die aangeven of de verandering ervoor zal zorgen dat een doel een beetje toe- of afneemt (1 of -1), toe- of afneemt (2 of -2) of sterk toe- of afneemt (3 of -3). In dit voorbeeld denkt Anne dat het doel 'meer kunnen wandelen' toeneemt als ze

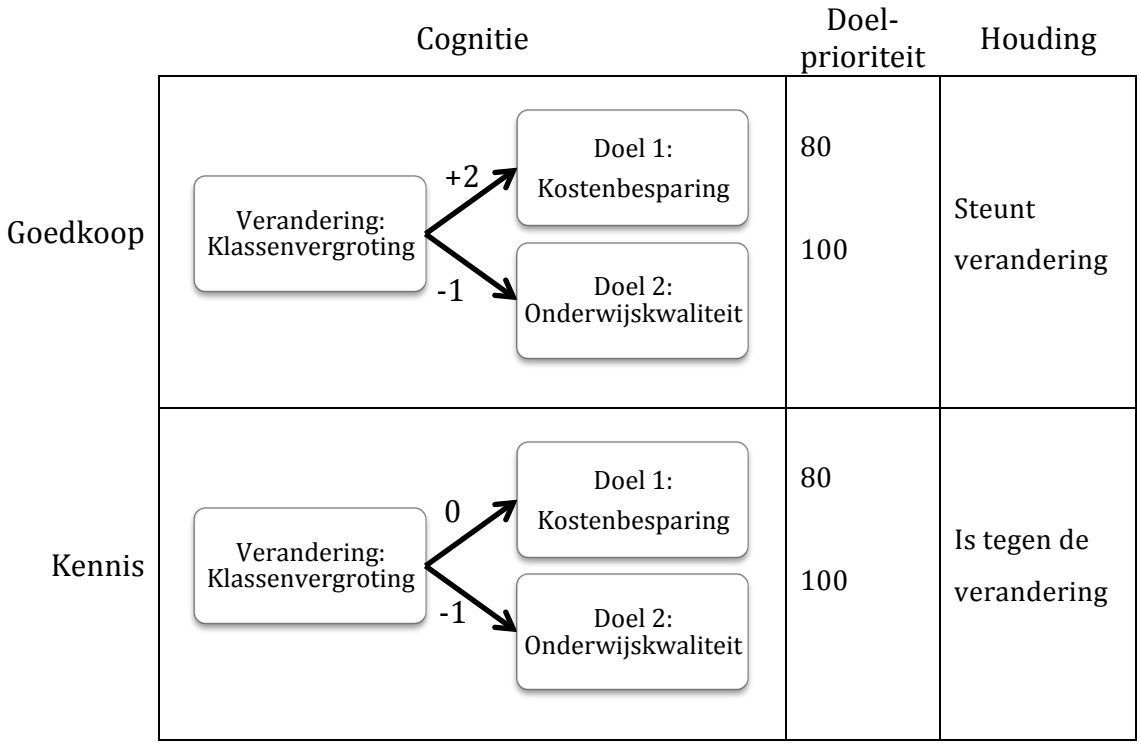
naar Eldersheen gaan en dat het doel 'musea kunnen bezoeken' een beetje afneemt. Per doel is een doelprioriteit aangegeven tussen nul en honderd. Het belangrijkste doel krijgt een prioriteit van 100. Lagere prioritieten geven het relatieve belang aan van dat doel ten opzichte van het belangrijkste doel (dit is vergelijkbaar met hoe belang gemeten is door bv. Bueno de Mesquita & Stokman, 1994; Stokman & Van Oosten, 1994; Septer, Stokman & Van der Iest, 2009).

Voorbeeld II: Vakantiebestemming, conflict door verschillende doelprioriteiten
In een kleine variatie op voorbeeld I denken Anne en Bert beiden dat Eldersheen minder wandelroutes heeft en iets minder musea dan Stastil. Voor Anne is wandelen belangrijker dan museumbezoek, terwijl voor Bert museumbezoek de hoogste prioriteit heeft. Anne heeft de voorkeur om te blijven, terwijl Bert juist liever wel naar Eldersheen wil reizen. In deze situatie hebben ze dezelfde cognitie, maar omdat hun doelprioriteiten verschillen, hebben ze toch een conflict (zie ook figuur 2).



Figuur 2: Cognitie, doelprioriteiten en houdingen uit voorbeeld II.

Voorbeeld III: Grotere klassengrootte, conflict door cognitieve verschillen
Op een school moet door de managers Goedkoop en Kennis besloten worden of er meer leerlingen in een klas moeten komen. Goedkoop verwacht dat grotere klassen zal leiden tot kostenbesparing en dat de onderwijskwaliteit slechts iets lager zal worden. Hij vindt onderwijskwaliteit slechts iets belangrijker dan kostenbesparing en is daarom voorstander van klassenvergroting (de positieve gevolgen op kostenbesparing zijn groter dan de negatieve gevolgen op onderwijskwaliteit). Ook Kennis vindt onderwijskwaliteit belangrijker dan kostenbesparing. Hij denkt dat door klassenvergroting de cijfers lager zullen worden, minder leerlingen over zullen gaan en dat daardoor het aantal aanmeldingen voor de school zal afnemen. Aangezien de vaste kosten voor gebouwen en ondersteunend personeel nauwelijks zullen afnemen, zullen de kosten per leerling toenemen. Hij gelooft dat klassenvergroting geen effect zal hebben op kostenbesparing en wel zal leiden tot lagere onderwijskwaliteit. Daarom is hij tegenstander van klassenvergroting (zie figuur 3).



Figuur 3: Cognitie, doelprioriteiten en houdingen uit voorbeeld III.

In bovenstaande voorbeelden zijn de inschattingen van de gevolgen (zoals het aantal wandelroutes of kostenbesparing) van de verandering (naar Eldersheen reizen of klassenvergroting) deel van iemands cognitie. Voorbeeld I is een illustratie van een situatie waarin het uitwisselen van informatie zal leiden tot een betere beslissing. Immers, ze ontdekken dat beiden dat de verandering om naar Eldersheen te gaan, minder goed is dan in Stastil blijven. Dit sluit aan bij theorieën die stellen dat cognitieve verschillen tussen medewerkers ervoor zorgen dat 'groepsdenken' (Janis, 1982) wordt voorkomen en dat innovatieve en kwalitatief betere veranderingen worden ingevoerd doordat men verschillende cognities uitwisselt (De Dreu, 2006; Jehn & Mannix, 2001; Mooney, Holahan & Amason, 2007; Tjosvold, 2008). Echter, in voorbeeld I was op basis van de verschillende cognities geen conflict. Wanneer men voorafgaand aan een discussie dezelfde voorkeur heeft, blijken minder argumenten die tegen die voorkeur pleiten te worden uitgewisseld (Stasser & Titus, 1985; Wittenbaum, Hollingshead, & Botero, 2004). Hierdoor kan het gebeuren dat men dezelfde voorkeur blijft houden, terwijl iedereen op basis van alle beschikbare informatie van voorkeur zou veranderen. Als men dezelfde houding ten opzichte van een verandering heeft, gebaseerd op andere cognitie, bestaat dus het gevaar op suboptimale beslissingen (Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007).

Wanneer verschillende cognities wel leiden tot conflict, zal informatie-uitwisseling waarschijnlijker zijn en bestaat de kans dat er daarna een betere beslissing wordt genomen (of dezelfde beslissing met meer steun). In voorbeeld III zouden Goedkoop en Kennis na een discussie qua cognitie meer op een lijn komen. Als Goedkoop de redenering van Kennis overneemt, zal hij ook tegen de klassenvergroting zijn, aangezien ze dezelfde doelprioriteiten hebben. Als er een conflict is en dat conflict met name het gevolg is van cognitieve verschillen over de effecten van de verandering op de doelen, typeren we dit conflict als een *cognitief conflict* (zoals voorbeeld III).

Er zijn echter ook situaties waarin voorstanders vooral met elkaar communiceren en niet met mensen uit de groep tegenstanders, en vice versa (Lau & Murnighan, 1998; 2005; Flache & Mäs, 2008). Als er twee gepolariseerde groepen ontstaan, zal de organisatie minder goed presteren (Molleman, 2005;

Pelled, 1996). Maar zelfs als voor- en tegenstanders wel communiceren en na het uitwisselen van argumenten tot dezelfde cognitie komen, kunnen ze nog steeds in conflict zijn. Dat gebeurt als ze verschillende belangen toekennen aan de doelen. Ze zijn dan in een *doelconflict*, zoals in Voorbeeld II.

Er zijn dus zowel theorieën die stellen dat weinig cognitief conflict nodig is voor succesvolle reorganisaties en verhoogde teamprestaties. Aan de andere kant wordt gesteld dat cognitief conflict leidt tot kwalitatief betere organisatieveranderingen. Een verklaring voor deze tegenstrijdige theorieën en tegenstrijdige bevindingen is dat cognities en cognitief conflict op verschillende manieren geconceptualiseerd en gemeten zijn. Zo is cognitief conflict vaak gemeten op teamniveau met vragenlijsten waarin gevraagd wordt om aan te geven in welke mate er cognitief conflict is binnen het team (Mooney et al., 2007; Labianca et al., 2000). De mate van conflict is dan gemeten met vragen als 'In hoeverre zijn er meningsverschillen in uw team?' of 'Hoe vaak zijn mensen uit uw team het oneens over hoe dingen gedaan zouden moeten worden?' (Jehn, 1994; Pelled et al., 1999).

In deze studies worden individuele cognities over specifieke veranderingen niet in kaart gebracht. Volgens ons ontbreekt er een aanpak waarin individuele cognities in kaart worden gebracht waarmee de drie cruciaal verschillende situaties uit onze drie voorbeelden kunnen worden geïdentificeerd. Zo zouden met de bestaande methoden om cognitief conflict te meten in situaties zoals in voorbeeld I geen cognitieve conflicten op teamniveau worden opgemerkt, waardoor mogelijke suboptimale beslissingen niet worden opgemerkt. Door cognitief conflict te meten met vragen waarin geen onderscheid wordt gemaakt in de causale cognitie (is men het met elkaar eens hoe groot de gevolgen van een verandering op bepaalde doelen zijn?) en de doelprioriteiten, kunnen cognitieve conflicten en doelconflicten niet onderscheiden worden. Dit onderscheid is echter cruciaal aangezien ze op andere manieren kunnen worden opgelost (Deutsch, 1977, 1984). Discussie en informatieuitwisseling draagt vaak bij aan het oplossen van cognitieve conflicten, maar is minder geschikt voor het oplossen van doelconflicten (Alexander, 1979; Mohammed & Ringseis, 2001; Tjosvold, 1985, 2008). Voor doelconflicten is onderhandelen meer geschikt, waarbij meerdere onderwerpen tegelijk worden besproken (bijvoorbeeld een

pakket van verschillende organisatieveranderingen) en waarbij de een zijn zin krijgt bij het ene onderdeel en de ander zijn zin krijgt bij een ander onderdeel (Udehn, 1996; Arregui et al, 2006; Dijkstra, van Assen & Stokman, 2008; Stokman et al, 2013). In voorbeeld II waarin Anne niet naar Eldersheen wilde en Bert wel zou informatieuitwisseling het conflict niet oplossen (ze waren het al eens over de gevolgen). Hun conflict kwam voor uit verschillende doelprioriteiten, waardoor ze bijvoorbeeld als oplossing ervoor zouden kunnen kiezen om nog enkele dagen in Stastil te blijven en daarna nog enkele dagen naar Eldersheen te gaan.

Cognitievorming

Naast de relatie tussen cognitie, doelprioriteiten en houding, onderzoeken we ook de vorming van individuele cognities. Wat zorgt ervoor dat de ene medewerker denkt dat de organisatieverandering positieve effecten op een bepaald doel zal hebben, terwijl een ander denkt dat de gevolgen negatief (of minder positief) zullen zijn? Veel verklaringen leggen de nadruk op omgevingsfactoren zoals het behoren tot dezelfde groep en interindividuele beïnvloeding (Lockett et al., 2014). Cognitie wordt dan dus gevormd door sociale interactie (Abelson, 1964; Brass, Galakiewicz, Greve, & Tsai, 2004; Kerr & Tindale, 2004). Alternatieve verklaringen, waarbij meer nadruk ligt op cognitieve processen binnen individuen zelf, lijken naar de achtergrond te zijn verschoven. Mensen hebben de neiging om cognitieve dissonantie, ambiguïteit en onzekerheid te verminderen (Heider, 1958; Festinger, 1957; Kruglanski & Webster, 1996; Lindenberg, 2006). Men heeft te neiging om niet zowel grote voordelen als grote nadelen te willen zien. Hierbij spelen twee mechanismen; een inschatting van het effect van een verandering op een bepaald doel veranderen of het doelbelang aanpassen (Festinger, 1957). Stel dat iemand een organisatieverandering steunt maar ook een groot negatief effect ziet. Door argumenten over te nemen waarom het effect minder groot is, zou de cognitieve dissonantie afnemen. Een andere manier om de dissonantie te verminderen is om het doel minder prioriteit te geven. We zullen de term *cognitieve consonantie*

gebruiken voor het streven naar het verminderen van de mate van cognitieve dissonantie.

Ter illustratie beschouwen we een kleine variatie op Voorbeeld III. Stel dat Kennis in eerste instantie dacht dat klassenvergroting zou leiden tot lagere onderwijskwaliteit maar ook tot kostenbesparing. Dan zou hij tegen de klassenvergroting zijn terwijl ook voordelen ervan zag. Omdat hij tegen de verandering is, zal hij geneigd zijn die voordelen minder groot te willen maken, ofwel door op zoek te gaan naar argumenten waarom de kostenbesparing minder groot zal zijn, danwel door het belang van kostenbesparing ten opzichte van onderwijskwaliteit verder te bagatelliseren.

ONDERDERZOEKSVRAGEN

In de literatuur wordt de relatie tussen cognitie over gevolgen van organisatieveranderingen en de houding van medewerkers ten aanzien van die veranderingen, veelal impliciet gelegd. Verder is het nog onduidelijk in hoeverre cognitie gevormd wordt door interindividuele processen zoals sociale interactie en in hoeverre ze gevormd wordt door intra-individuele processen als cognitieve consonantie. De twee hoofdvragen van dit proefschrift zijn:

Welke cognitieve verschillen tussen medewerkers over de gevolgen van een organisatieverandering leiden tot conflicterende houdingen ten opzichte van die verandering?

In hoeverre worden verschillen in cognitie verklaard door sociale context en in hoeverre door intra-individuele consonantie?

AANPAK: COGNITIVE MAPS

Ons doel was om data te verzamelen waarmee we de individuele cognitie van medewerkers over de gevolgen van organisatieveranderingen in kaart konden brengen op een manier waardoor we i) konden voorspellen welke houding ze zouden hebben ten opzichte van de verandering en ii) we de cognities konden vergelijken tussen medewerkers en konden analyseren welke cognitieve verschillen leiden tot verschillende houdingen. De houdingen ten opzichte van de verandering zijn gemeten met de schaal voor cognitieve weerstand van Oreg

(2006). Om data over de cognitie te verzamelen zijn zogenaamde 'cognitive maps' (Axelrod, 1976; Huff, 1990) zeer geschikt. Dit zijn modellen waarin de redeneringen van mensen worden weergegeven door punten en lijnen. De punten stellen concepten voor zoals de organisatieverandering, de doelen en eventuele subdoelen. De pijlen geven aan of er causale verbanden zijn en de gewichten bij de pijlen geven aan hoe groot en in welke richting die verbanden zijn. We gebruiken cognitive maps met één beginpunt (de verandering) en enkele einddoelen (Montibeller & Belton, 2006). Een voorbeeld van zo'n cognitive map is Figuur 5 in Hoofdstuk I. Cognitive maps zijn eerder gebruikt om cognities te vergelijken (Langfield-Smith & Wirth, 1992; Markoczy & Goldberg, 1995), door middel van een afstandsmaat. Als punten in de ene map wel aanwezig waren en in de andere niet, dan werd de afstand groter. Ook als pijlen in de ene map wel aanwezig waren en in de andere niet, werd de afstand tussen die cognitieve kaarten groter. Deze afstandsmaten zijn niet geschikt om conflict te analyseren, aangezien er geen rekening mee kan worden gehouden welke verschillen wel leiden tot andere houdingen en welke cognitieve verschillen niet leiden tot andere houdingen. Ook andere maten om cognitieve kaarten te vergelijken, zoals de mate van complexiteit van een map (Eden et al., 1992) leggen geen relatie tussen de maps en de houding ten opzichte van de organisatieverandering.

We hebben data verzameld over de gevolgen van concrete reorganisaties in drie verschillende Nederlandse organisaties. Er zijn verschillende manieren om data over cognitive maps te verzamelen. Om de maps goed te kunnen vergelijken hebben wij zogenaamde nomothetische maps verzameld (Hodgkinson, 1997, 2002). Dat zijn maps waarin iedereen van dezelfde verzameling punten en lijnen aangeeft hoe sterk de verbanden zijn. De data zijn verzameld in drie stappen. We hebben eerst verschillende medewerkers geïnterviewd over de gevolgen van de reorganisaties. Op basis van deze interviews en op basis van documentatie met de achtergronden van de reorganisaties, hebben we een selectie gemaakt van de belangrijkste concepten die genoemd zijn (de punten in de cognitieve maps). We hebben ook een selectie gemaakt van de pijlen, oftewel de relaties tussen de concepten. Als geen van de geïnterviewden een relatie tussen twee concepten noemde, hebben we die relatie niet opgenomen in onze selectie. Vervolgens

hebben we vragenlijsten gemaakt waarin we onder andere de vragen hebben toegevoegd over hoe sterk de relaties tussen de concepten was. Dit deden we met vragen als 'als [concept 1] toeneemt, dan zal [concept 2] …' waarin men op de puntjes kon kiezen uit een 7-punts Likertschaal van sterk afnemen (-3) tot en met sterk toenemen (+3). In de vragenlijst waren ook vragen opgenomen voor de doelprioriteit van 0 (totaal niet belangrijk) tot 100 (het belangrijkste doel). Er werd gevraagd om het belangrijkste doel het getal 100 te geven en vervolgens aan de andere doelen een getal tussen 0 en 100 toe te kennen waarmee werd uitgedrukt hoe belangrijk dat doel was ten opzichte van het belangrijkste doel (vergelijk Bueno de Mesquita & Stokman, 1994; Stokman & Van Oosten, 1994; Septer, Stokman & Van der Iest, 2009).

De tweede stap was om de vragenlijst, die gebaseerd was op de documentanalyse en interviews, voor te leggen aan een pilotgroep. Hierin zaten andere medewerkers dan degenen die geïnterviewd waren. Terwijl ze de vragenlijsten invulden werd gekeken of er onduidelijkheden waren en er werd gevraagd of er concepten of relaties misten. Vervolgens werd de uiteindelijke papieren vragenlijst gemaakt, die verstuurd werd naar een willekeurig gekozen steekproef van de medewerkers.

OVERZICHT VAN DE VIER STUDIES

Hoofdstuk II

In dit hoofdstuk staat het onderscheid tussen doelconflict en cognitief conflict centraal (Hammond et al, 1966; McGrath, 1984; Deutsch, 1977, 1994). We vergelijken de cognities van de medewerkers met die van het management, die de reorganisaties heeft voorgesteld. Onze eerste stap is om op basis van de cognitieve maps en de doelprioriteiten te voorspellen in hoeverre medewerkers de reorganisatie steunen. Daarvoor introduceren we een maat voor het *totale effect* van de reorganisatie. Dat is het gewogen gemiddelde van de effecten van de reorganisatie op de doelen, waarbij de gewichten de doelprioriteiten zijn. Los van de cognitieve data hebben we ook gegevens verzameld over de houding van medewerkers tegenover de verandering (Oreg, 2006). Onze maat voor het totale effect blijkt sterk te correleren met de houding van medewerkers. Dit geeft aan

dat we met onze maat goed kunnen voorspellen wat iemands houding is, op basis van hun cognitie en doelprioriteiten.

Onze volgende stap was om te analyseren hoe de houdingen van medewerkers zouden veranderen, als ze ofwel dezelfde cognitie zouden hebben als het management, danwel dezelfde doelprioriteiten als management. Door de werkelijke cognitie van de medewerkers te combineren met de doelordening van het management, en daarmee de totale effecten uit te rekenen, kunnen we een goede voorspelling doen over de houdingen van medewerkers als ze dezelfde doelordening zouden hebben als het management. Evenzo kunnen we door de cognitie van het management te combineren met de daadwerkelijke doelordening van de medewerkers, analyseren wat het totale effect volgens elke medewerker zou zijn, als ze de cognitie van het management zouden overnemen (oftewel, wat zou de houding van de medewerker worden, mocht het management erin slagen om de medewerker te overtuigen van de mate waarin de reorganisatie (positief) zal doorwerken op de doelen).

In data over twee reorganisaties in een forensisch psychiatrisch centrum (N=102) en twee reorganisaties in een jeugdzorginstelling (N=97), bleek dat de houding van medewerkers significant positiever zou worden wanneer ze de cognitie van het management zouden overnemen, ten opzichte van de situatie waarin ze de doelordening van het management zouden overnemen. In andere woorden, het conflict was met name een cognitief conflict en niet zozeer een doelconflict. Het onderscheiden of een conflict met name een cognitief conflict is of een doelconflict, is relevant voor de vraag of en hoe het conflict opgelost kan worden. Discussie en informatieuitwisseling blijkt geschikt om cognitieve conflicten op te lossen en niet zozeer om doelconflicten op te lossen (Alexander, 1979; Mohammed & Ringseis, 2001; Tjosvold, 1985, 2008). Doelconflicten kunnen worden opgelost door onderhandeling over meerdere onderwerpen, waarbij men op het ene onderwerp instemt tegen de eigen voorkeur om op een ander onderwerp steun van anderen te krijgen (Udehn, 1996; Arregui et al, 2006; Dijkstra, Van Assen & Stokman, 2008; Stokman et al, 2013). Voor de reorganisaties in onze data is het dus waarschijnlijk dat als het management erin zou slagen om de effecten die zijn verwachten op de doelen op de medewerkers

over te brengen, de steun voor de reorganisaties meer zal toenemen, dan wanneer ze erop zouden hameren welke doelen belangrijk zijn.

Hoofdstuk III

In hoofdstuk III ligt de focus op het analyseren van complexe cognitieve maps. Dat wil zeggen, maps waarin redeneringen bestaan uit meerdere stappen, dus waarin tussen de reorganisatie en de doelen nog enkele subdoelen zitten. In Voorbeeld III is de redenering van meneer Kennis (klassengrootte – lagere cijfers – afname overgangspercentage – minder aanmeldingen – relatieve kosten per leerling hoger) een voorbeeld van zo'n complexere redenering. In dit hoofdstuk wordt geanalyseerd welke specifieke verschillen in cognitie veel bijdragen aan het conflict (dus op welke pijl in de map uiteenlopende inschattingen ervoor zorgen dat er zowel voor- als tegenstanders zijn). Bestaande maten om verschillen tussen maps te analyseren (Eden, Ackerman & Cropper, 1992; Eden, 2004; Langfield-Smith & Wirth, 1992; Markóczy & Goldberg, 1995) relateren de verschillen in cognities niet aan de houding ten opzichte van de verandering, waardoor we een eigen maat moeten introduceren.

We stellen een maat voor om het directe effect van de reorganisatie op een bepaald einddoel te berekenen, op basis van de complexere paden via subdoelen. Montibeller en Belton (2006) hebben een maat voorgesteld om op basis van zo'n cognitieve map de partiële effecten (het effect van een specifieke redenering van een reorganisatie op een specifiek doel) en de totale effecten (de combinaties van verschillende redeneringen over de gevolgen van de reorganisatie op dat doel, dus een combinatie van de partiële effecten) te berekenen. De maat die zij voorstellen voldoet echter niet aan enkele eisen die wij aan onze maat stellen. Zo willen we dat het gewicht van elke pijl in de map bijdraagt aan het totale effect. Een andere voorwaarde is dat het partiële effect positief is als er een even aantal negatieve causale relaties inzitten. En de mogelijke grootte van het totale effect van de reorganisatie op een bepaald doel, mag niet afhangen van de lengte van de redenering, alleen van de gewichten die men toekent aan de pijlen in de cognitieve map.

In een dataset over de gevolgen van een fusie van twee organisaties correleert onze maat voor het totale effect sterk met de houding ten opzichte van de verandering (N=94). We stellen ook een analyse voor om te bepalen welke cognitieve verschillen het meest bijdragen aan conflict, dus aan de mate waarin de houdingen van medewerkers ten opzichte van de fusie, verschillen. Door in de maps van elke medewerker steeds één relatie (gewicht aan een pijltje) te vervangen door het groepsgemiddelde op die relatie, kunnen we voorspellen in welke mate het conflict zou afnemen als er overeenstemming wordt bereikt over dat deel van de cognitie. Het blijkt dat de mate van conflict niet het meest afneemt door overeenstemming te bereiken op de causale stappen met de grootste spreidingen in de groep medewerkers.

Hoofdstuk IV

Cognities van medewerkers over de gevolgen van organisatieveranderingen lopen uiteen. Om cognities meer op één lijn te krijgen, is inzicht nodig op het ontstaan van die verschillende cognities. Hoe kunnen we verklaren dat de ene medewerkers positievere gevolgen van een organisatieverandering verwacht dan een andere medewerker?

Er zijn verschillende *contextuele* verklaringen voor reacties op organisatieveranderingen (Oreg et al., 2011:466; Herold, Fedor, & Caldwell, 2007): groepslidmaatschap, beïnvloeding tussen personen en de invloed van iemands sociale positie (Lockett et al., 2014) zijn belangrijke factoren voor het verklaren van cognitieve diversiteit. Cognitie wordt gevormd door sociale interactie (Abelson, 1964; Brass, Galakiewicz, Greve, & Tsai, 2004; Kerr & Tindale, 2004). Naast deze interindividuele verklaringen, zijn er ook *intraindividuele* processen die cognitie vormen. De mens heeft de neiging om cognitieve dissonantie, ambiguïteit en onzekerheid te willen vermijden of verminderen (Heider, 1958; Festinger, 1957; Kruglanski & Webster, 1996; Lindenberg, 2006). Men probeert te vermijden om zowel extreem positieve als extreem negatieve gevolgen te zien van eenzelfde organisatieverandering. Daarbij spelen twee mechanismen een rol, het aanpassen van delen van de eigen causale cognitie (dus de mate waarin men denkt dat een verandering zal

bijdragen aan het behalen van een bepaald doel) of het aanpassen van de doelprioriteiten (Festinger, 1957). Stel dat een medewerker de verandering steunt maar ook een extreem negatief effect ervan verwacht. Dan zou het aanpassen van de cognitie betekenen dat hij makkelijker argumenten zal overnemen die ervoor pleiten dat het negatieve effect op dat bewuste doel helemaal niet zo groot is. Een andere manier om de cognitieve dissonantie te verminderen is om het belang dat aan het bewuste doel wordt toegekend te bagatelliseren, dus om de doelprioriteiten te herzien. We gebruiken de term *cognitieve consonantie* voor het streven naar het reduceren van cognitieve dissonantie.

Onze hypotheses zijn dat zowel contextuele processen als cognitieve consonantie bijdragen aan de vorming van individuele cognities. We analyseren data van twee organisaties, een forensisch psychiatrisch centrum (N=102) en een jeugdzorginstelling (N=97). In beide organisaties waren plannen voor twee organisatieveranderingen met grote gevolgen, zoals het anders inrichten van een zorgprogramma of het opdelen van de organisatie in een andere regiostructuur. We gebruiken multivariate multilevel modellen waarbij de afhankelijke variabelen genest zijn binnen individuele medewerkers (Snijders & Bosker, 1999). De afhankelijke variabelen zijn de zogenaamde verandering impact percepties op elk van de doelen: het verwachte causale effect vermenigvuldigd met de relatieve doelprioriteit. Er is sprake van cognitieve consonantie als deze impact percepties sterk correleren. Een deel van die correlatie kan echter toe te schrijven zijn aan contextuele verklaringen. We hebben gecontroleerd voor groepslidmaatschap en sociale positie door variabelen zoals afdeling, opleiding en hiërarchisch niveau (manager of niet) op te nemen in de verklaring van de cognities (de impact percepties, die genest waren binnen personen). Medewerkers binnen dezelfde hiërarchische functie en binnen dezelfde afdeling, bleken qua cognitie meer op elkaar te lijken dan op medewerkers in een andere hiërarchische functie op afdeling. Er zijn dus contextuele factoren die bijdragen aan de vorming van de cognitie. Echter, in deze modellen waarin al gecontroleerd was voor contextuele factoren, bleken de covarianties tussen de verschillende impact percepties wezenlijk positief af te wijken van nul. Dat wil zeggen dat een medewerker die een groot positief effect op een bepaald doel

verwacht, ook meer positieve effecten verwacht op de andere doelen. Er blijkt dus ook sprake te zijn van cognitieve consonantie.

Hoofdstuk V

Als medewerkers discussiëren en informatie uitwisselen, kan dat leiden tot innovatieve oplossingen en kwalitatief goede organisatieveranderingen (bv. Jehn & Mannix, 2001; Mooney, Holahan & Amason, 2007). Uit sociaal psychologische experimenten waarin groepen tot een beslissing moeten komen (bijvoorbeeld over wie de meest geschikte sollicitant is, of wat de beste vakantiebestemming is), maar waarbij de individuen deels unieke informatie hebben, blijkt dat men vaak informatie achterhoudt die niet overeenkomt met de voorkeur die men voorafgaand aan de discussie heeft. Hierdoor komt de groep vaak tot suboptimale besluiten (Stasser & Titus, 1978; Schultz-Hardt et al, 2006), zoals het geval zou zijn als in Voorbeeld I uit het begin van deze samenvatting, Anne en Bert niet alle informatie zouden uitwisselen. Stel dat de groep moet kiezen uit alternatief A of B, waarbij men op basis van alle informatie voorstander zou zijn van B. Dan zal met name in situaties waarin de informatie die in voordeel spreekt van A (de pluspunten van A en de minpunten van B) bij iedereen bekend zijn, terwijl de informatie die in het voordeel van B zijn (de voordelen van B en de nadelen van A) slechts bij één of enkelen bekend zijn, de kans groot zijn dat men na de discussie nog steeds de voorkeur voor A heeft (Stasser & Titus, 1985; Greitemeyer & Schulz-Hardt, 2003; Scholten, Van Knippenbreg, Nijstad & De Dreu, 2007). De volledige informatie die bekend is binnen de groep wordt in deze onderzoekslijn het *hidden profile* genoemd (Wittenbaum, Hollingshead & Botero, 2004).

Deze experimenten hebben met elkaar gemeen dat iedereen uit de groep dezelfde voorkeur zou hebben op basis van volledige informatie. In andere woorden, de aanname in dit onderzoek is dat individuen allemaal hetzelfde belang doel kennen aan alle informatie, waardoor ze allemaal dezelfde voorkeur zullen hebben, op basis van de volledige informatie. Wij vinden dat die aanname in veel situaties niet realistisch is. Zoals we in Voorbeeld II hebben geïllustreerd, kunnen twee mensen verschillende voorkeuren hebben op basis van precies

dezelfde informatie (dus dezelfde cognitie). Dat is het geval als de doelprioriteiten verschillen, dus als men in een doelconflict is. Alle informatie uitwisselen zou er in zo'n geval toe kunnen leiden dat er juist conflict ontstaat, terwijl men het vooraf eens was.

In dit hoofdstuk geven we een theoretische onderbouwing wanneer het delen van alle beschikbare informatie tot een betere beslissing zal leiden, wanneer het tot een conflict zal leiden. Op basis van de informatie die men voorafgaand aan de discussie heeft, de initiële informatie, is men het er allemaal over eens welk alternatief het best is, of is er conflict. De eerste situatie staat in de speltheorie bekend als *ranked coordination*, de tweede als *battle of sexes* (bv. Rasmussen, 2007, p. 28-29). Wanneer men alle informatie uitwisselt en de doelprioriteiten voor iedereen gelijk zijn, zal men na de discussie altijd uitkomen in een *ranked coordination*, waarin iedereen dezelfde voorkeur heeft. Wanneer men echter verschillende doelprioriteiten heeft, kan men na het uitwisselen van alle informatie (dus in het *hidden profile*) in een *battle of sexes* situatie uitkomen. Men heeft dan een belangenconflict waarin geen Pareto optimale uitkomst is, oftewel geen uitkomst die volgens iedereen de voorkeur heeft (Coleman, 1990, p. 113-114) en er dus ook geen sprake is van een suboptimale uitkomst (voor de gehele groep).

Met data waarin 83 studenten hun voorkeur konden aangeven over twee fictieve reorganisaties, tonen we aan dat er in het *hidden profile* inderdaad conflict optreedt tussen mensen met verschillende doelprioriteiten. De respondenten kregen initieel informatie over beide reorganisaties en werden om hun voorkeur gevraagd. Vervolgens werd hun voorkeur gevraagd op basis van alle informatie. De stukken informatie hadden betrekking op collectieve doelen, zoals de mate van conflict binnen de organisatie en meer tijd om elkaar te kunnen helpen, en op persoonlijke doelen, zoals leiding krijgen over meer mensen en meer invloed hebben op beleid van de organisatie (vgl. de egoïstische en collectieve doelen uit klimaatstudies van De Groot en Steg, 2008). De doelprioriteiten van respondenten zijn ook verzameld. We hebben onze maat uit hoofdstuk II om op basis van cognitie (de gegeven informatie) en de doelprioriteiten het totale effect van de reorganisaties te voorspellen. Dat bleek wederom een goede maat te zijn om de houding ten opzichte van de

veranderingen te verklaren. Vervolgens hebben we als-of-analyses uitgevoerd waarin we alle mogelijke duo's die initieel andere informatie hadden aan elkaar gekoppeld (dat zijn 1716 duo's). We hebben geanalyseerd in hoeveel gevallen men het initieel met elkaar eens was en in hoeveel gevallen daarvan de voorkeur in het *hidden profile* gelijk bleef, voor beiden veranderde (dus initieel suboptimaal was) of juist tot een conflict leidde (één persoon die van voorkeur veranderd was). In onze data zou in 2,9 procent van de gevallen beiden van voorkeur veranderen en dus een suboptimale beslissing voorkomen worden als alle informatie zou worden gedeeld. Echter, in 29 procent van de gevallen zou een van de twee van voorkeur veranderen en zou er juist conflict ontstaan. Onder de paren die op basis van initiële informatie in conflict waren, zou door alle informatie uit te wisselen 45,7 procent van de conflicten worden opgelost en in de andere gevallen zou er conflict blijven.

CONCLUSIE EN DISCUSSIE

Antwoord op de onderzoeksvragen

Een eerste stap in het beantwoorden van de vraag welke cognitieve verschillen tussen medewerkers bijdragen aan conflicterende houdingen tegenover organisatieveranderingen, is de relatie te leggen tussen de cognitie en die houding. We werken deze relatie theoretisch uit en valideren haar met data. Onze maat voor het totale effect van een verandering correleert sterk met de houding tegenover de verandering. Deze correlatie geeft aan dat onze manier van het verzamelen van cognitieve map data op een voorgeselecteerde verzameling van concepten en relaties, inclusief doelprioriteiten, zinvol interpreteerbare data oplevert. Daarnaast levert het een eerste algemeen antwoord op onze onderzoeksvraag: verschillende houding ten opzichte van organisatieveranderingen, hebben hun basis in verschillende causale cognitie over de effecten van de verandering op doelen en / of in verschillende doelprioriteiten.

Op basis van onze bevindingen is echter een gedetailleerder antwoord mogelijk. In hoofdstuk II hebben we laten zien dat onze aanpak het mogelijk maakt om te analyseren of een conflict met name voortkomt uit verschillen in

cognitie tussen management en medewerkers of door verschillende doelprioriteiten. In hoofdstuk III hebben we geïllustreerd hoe met data over complexere maps, met daarin stap-voor-stap redeneringen van het effect van de verandering op de doelen, geanalyseerd kan worden welke specifieke stappen in die cognities het meest bijdragen tot conflict. Het conflict zou niet noodzakelijk het meest afnemen als er overeenstemming wordt bereikt op de stap in de cognitie waarop de variantie het grootst is. Er speelt ook mee in hoeveel redeneringen zo'n specifieke stap een rol speelt.

In hoofdstuk V hebben we met data aangetoond dat mensen met verschillende doelprioriteiten met elkaar in conflict kunnen zijn over organisatieveranderingen, ook als ze het eens zijn over de gevolgen ervan op de doelen. In die studie waren zowel persoonlijke doelen zoals inkomen en status, als collectieve doelen zoals tijd hebben om elkaar te helpen en gelijke mogelijkheden voor medewerkers. Het relatieve belang dat men toekende aan de collectieve doelen bleken onderling te correleren, het relatieve belang dat men toekent aan persoonlijke doelen ook. Voor sommigen bleken de persoonlijke doelen belangrijker dan de collectieve, voor andere was de prioriteit andersom. Dat wijst erop dat als reorganisaties invloed hebben op zowel persoonlijke doelen als op collectieve doelen, het waarschijnlijker is dat er doelconflicten optreden.

Dit resulteert in een gedetailleerder antwoord op onze eerste onderzoeksvraag: welke cognitieve verschillen tussen medewerkers over de gevolgen van organisatieveranderingen leiden tot conflicterende houdingen ten aanzien van die verandering?

> *Conflicterende houdingen zijn met name het gevolg van verschillen in de causale cognitie en in mindere mate door verschillende doelprioriteiten. Met name cognitieve verschillen die deel uitmaken van meerdere redeneringen over de effecten van de verandering op de doelen, dragen bij aan de mate van het conflict. Als een verandering effect heeft op zowel persoonlijke als collectieve doelen, treden er zowel cognitieve conflicten als doelconflicten op.*

Onze tweede onderzoeksvraag was of cognitievorming ontstaat door sociale context of door intrapersoonlijke consonantie. In hoofdstuk IV bleek dat de cognitie over de veranderingen in twee organisaties verklaard werd door afdeling en hiërarchisch niveau. Oftewel, de cognities van medewerkers binnen eenzelfde afdeling en de cognities van medewerkers binnen een zelfde hiërarchisch niveau (managementlaag) lijken meer op elkaar dan de cognities van medewerkers van een andere afdeling of hiërarchisch niveau. Echter, zelfs als we rekening hielden met achtergrondkenmerken van medewerkers, was er ook nog een correlatie tussen de effecten die een individuele medewerker verwachtte op verschillende doelen. Dat wil zeggen dat als een medewerker een sterk positief effect op het ene doel verwacht, hij over het algemeen ook positieve effecten op de andere doelen zal verwachten. En als hij ook een negatief effect verwacht, dan zal dat een klein effect zijn of een effect zijn op een doel met een lagere prioriteit. Het antwoord op onze tweede onderzoeksvraag is:

> *Zowel sociale context (behoren tot dezelfde afdeling of hetzelfde hiërarchische niveau) als intrapersoonlijke consonantie verklaren de cognitie van medewerkers over de gevolgen van organisatieveranderingen.*

Wezenlijke bijdragen van dit proefschrift

Dit proefschrift maakt vijf belangrijke bijdragen aan de literatuur over cognities leden van de organisatie over en houding ten opzichte van organisatieveranderingen. Ten eerste, werken we theoretisch de koppeling tussen cognities over de gevolgen van een organisatieverandering en houdingen ten opzichte van die organisatieverandering uit en onderbouwen deze koppeling empirisch (Hoofdstuk II , III en V). We hebben daarvoor een manier geïntroduceerd om nomothetische cognitieve map data (Hodgkinson et al., 1999) te verzamelen via vragenlijsten. Op deze manier kunnen bij een grote groep medewerkers goed vergelijkbare data over hun individuele cognities verzameld worden. Ten tweede houden we bij het in kaart brengen van de cognities van medewerkers zowel rekening met de sterkte van de effecten die een verandering op elk van de doelen heeft, als met de doelprioriteiten. Daardoor kunnen we

onderscheid maken in twee typen conflicten (Hoofdstuk II en V), namelijk cognitieve conflicten en doelconflicten. Het is belangrijk om deze typen conflict te kunnen onderscheiden, omdat ze om andere oplossingen vragen. In verschillende onderzoeksgebieden is gebleken dat cognitieve conflicten veelal opgelost kunnen worden door discussie en informatieuitwisseling, terwijl doelconflicten opgelost kunnen worden door onderhandeling en koehandel (Deutsch, 1977, 1994; Mohammed & Ringseis, 2001; Tjosvold, 1985, 2008; Udehn, 1996; Stokman et al., 2013). In hoofdstuk V hebben we aangetoond dat cognitieve conflicten opgelost kunnen worden door informatieuitwisseling, mits de doelprioriteiten binnen de groep (nagenoeg) gelijk zijn. We hebben ook aangetoond dat mensen met dezelfde cognitie maar verschillende doelprioriteiten in conflict kunnen zijn. Onze derde bijdrage is het onderscheiden onder welke verdeling van cognities en doelprioriteiten in een groep (van twee) informatieuitwisseling een conflict zal oplossen, zal laten bestaan, of juist zal creëren. Daarbij laten we ook empirisch zien dat doelconflicten bestaan en dat ze niet opgelost worden door informatieuitwisseling. Bovendien zal in situaties waarin men initieel dezelfde voorkeur heeft als de ander, het delen van alle informatie (dus ook de informatie die de eigen initiële voorkeur niet ondersteunt), de kans dat daardoor conflict ontstaat tien keer zo groot als de kans dat daardoor beiden van gedachten veranderen en tot een nog betere beslissing komen.

Onze vierde bijdrage is dat we een manier introduceren om in kaart te brengen welke cognitieve verschillen het meest bijdragen aan het conflict. We laten zien hoe we de verwachte houding van medewerkers kunnen berekenen als één stap in hun cognitieve redenering zou worden aangepast. We stellen dat op deze manier geïdentificeerd kan worden welke specifieke cognitieve verschillen tussen medewerkers het meeste bijdragen aan conflict over de wenselijkheid van een bepaalde organisatieverandering en we laten empirisch zien hoe onze aanpak werkt (Hoofdstuk III). Onze vijfde bijdrage is hoe we met de nieuwe en nauwkeurige manier waarop we cognitieve map data hebben verzameld, analyses uitvoeren om cognitievorming te verklaren. We gebruiken multilevel analyses en laten daarmee zien dat cognitie zowel gevormd wordt

door sociale context als door intrapersoonlijke neigingen om cognitieve dissonantie te verkleinen (Hoofdstuk IV).

ONZE BEVINDINGEN EN EERDERE BEVINDINGEN

Er is vaker gesteld dat cognitieve conflicten en doelconflicten bestaan en om andere oplossingsstrategieën vragen, maar dat ze vaak niet goed onderscheiden worden (bv. Deutsch, 1994; McGrath, 1984; Hammond et al., 1966). Het onderscheid werd veelal gemaakt in experimentele studies. Wij hebben aan de hand van data over concrete organisatieveranderingen, laten zien hoe de conflicttypen onderscheiden kunnen worden. We hebben aangenomen dat discussie en informatieuitwisseling wel geschikt zijn om cognitieve conflicten op te lossen en niet om doelconflicten op te lossen (Mohammed & Ringseis, 2001; Tjosvold, 1985, 2008; Udehn, 1996; Stokman et al., 2013). In hoofdstuk IV en V hebben we ook bewijs gevonden dat deze aanname ondersteunt. In hoofdstuk V hebben we aangetoond dat respondenten op basis van dezelfde informatie, tegenstrijdige houdingen ten aanzien van een organisatieverandering kunnen hebben als hun doelprioriteiten verschillen. In hoofdstuk IV hebben we aangetoond dat cognitie deels bepaald wordt door sociale context, hetgeen erop wijst dat cognitieve conflicten kunnen worden opgelost door discussie en informatieuitwisseling. Uit eerdere studies is gebleken dat medewerkers over het algemeen meer sociale interactie hebben met anderen binnen dezelfde afdeling of hetzelfde hiërarchische niveau (Lazersfeld & Merton, 1954; McPherson, Smith-Lovin & Cook, 2001). Sociale interactie leidt tot beïnvloeding (Festinger, Schachter & Back, 1950) en men past de eigen cognitie aan aan die van anderen waarmee men interactie heeft (Abelson, 1964; Brass, Galakiewicz, Greve, & Tsai, 2004; Kerr & Tindale, 2004).

In hoofdstuk II hebben we geanalyseerd wat er zou gebeuren met de houding van medewerkers als ze respectievelijk de cognitie of de doelprioriteiten van de hoogste managementlaag (de directie) zouden overnemen. Die analyses hebben alleen betekenis als het management er door discussie en informatieuitwisseling voor zou kunnen zorgen dat de medewerkers hun cognitie overnemen. In hoofdstuk III hebben geanalyseerd hoe de houdingen van medewerkers zouden

veranderen als ze op één of enkele stappen in hun cognitie hetzelfde zouden worden. Daarvoor namen we aan dat door discussie de groep op die stappen zou uitkomen op het groepsgemiddelde. Vaak zal sociale interactie leiden tot meer gelijk cognities, maar er zijn kanttekeningen bij te maken. Zo stellen Lau en Murnighan (1998, 2005) dat er polarisatie in opinies (of cognities) kunnen optreden als er sprake is van zogenaamde 'demografische breuklijnen'. Als binnen een organisatie groepen bestaan die op meerdere kenmerken hetzelfde zijn, bijvoorbeeld een groep jonge hoogopgeleide vrouwen en een groep oudere laagopgeleide mannen, dan wordt de kans op polarisatie groter. Wanneer geïsoleerde groepen ontstaan die onderling veel interactie met elkaar hebben, maar juist geen interactie hebben met anderen of de argumenten van anderen juist verwerpen (Flache & Mäs, 2008), dan bestaat het gevaar dat binnen die groepen de cognities meer op elkaar gaan lijken, maar dat de cognities tussen verschillende groepen daardoor juist verder uit elkaar komen te liggen. Onze bevinding dat cognitie verklaard wordt door afdeling en hiërarchisch niveau sluit aan bij de theorie van demografische breuklijnen, maar we vonden ook dat er nog verschillen in cognitie waren tussen medewerkers binnen die subgroepen. Dat de cognities consonant zijn, kan erop wijzen dat mensen geneigd zijn om informatie die niet bij hun houding ten aanzien van de verandering past, minder serieus zullen nemen (het zou immers leiden tot meer cognitieve dissonantie). Aan de andere kant, als men op een bepaald punt wel overtuigd wordt, kan het streven naar cognitieve consonantie er ook voor zorgen dat men andere delen van de cognitie ook aanpast.

BEPERKINGEN EN TOEKOMSTIG ONDERZOEK

In de voedselinspectieorganisatie (hoofdstuk III) hebben data verzameld waarin de cognitieve maps bestaan uit een grote hoeveelheid concepten en relaties. Echter, we hebben alleen ordinale data verzameld over de doelprioriteiten. Daardoor konden we de doelprioriteiten niet meenemen in onze analyses in dat hoofdstuk. In het forensisch psychiatrisch centrum en de jeugdzorginstelling hebben we de doelprioriteiten gemeten op rationiveau, waardoor we cognitieve conflicten en doelconflicten konden onderscheiden (hoofdstuk II) en cognitieve

consonantie konden analyseren (hoofdstuk IV). Echter, in deze organisatie zijn de cognitieve gegevens beperkt gebleven tot de directe effecten van de verandering op de doelen. Daardoor waren we in hoofdstuk II wel in staat om te kunnen identificeren dat er cognitieve conflicten waren in de organisaties, maar we konden niet analyseren welke specifieke cognitieve verschillen het meest bijdroegen aan het conflict.

Onze data zijn transversaal. Op basis van onze analyses stellen we voor dat conflicten waarschijnlijk zouden verminderen door discussie (over bepaalde argumenten). Om te kunnen analyseren of daardoor inderdaad de conflicten kleiner worden, zouden er interventies gepleegd moeten worden en longitudinale data verzameld moeten worden. In hoofdstuk IV gebruiken we het behoren tot dezelfde afdeling of dezelfde managementlaag als proxy voor sociale interactie. Om daadwerkelijk te onderzoeken of mensen die meer interactie met elkaar hebben qua cognitie meer op elkaar (gaan) lijken, zijn netwerkdata nodig.

In hoofdstuk V hebben we geanalyseerd in hoeveel gevallen het uitwisselen van informatie zou leiden tot een groter conflict of zelfs een conflict zou creëren terwijl men in eerste instantie dezelfde voorkeur had. Daarvoor hebben we als-of-analyses uitgevoerd waarin we respondenten gekoppeld hebben en hebben gekeken naar hun voorkeuren op basis van alle beschikbare informatie. Om uit te zoeken hoe de informatieuitwisseling tussen mensen daadwerkelijk gaat, zouden studies nodig zijn waarin respondenten daadwerkelijk informatie uitwisselen, in een (digitaal) groepsgesprek. In hoofdstuk V concluderen we dat het uitwisselen van alle informatie, dus ook informatie die niet strookt met de eigen initiële voorkeur, rationeel is als de doelprioriteiten van iedereen hetzelfde zijn. In dat geval zal informatie uitwisselen mogelijke suboptimale beslissingen voorkomen. Om te onderzoeken of in groepen waarin de doelordeningen hetzelfde zijn meer (onwelvallige) informatie wordt gedeeld dan in groepen waarin de doelprioriteiten verschillen, zouden experimenten opgezet kunnen worden waarin men op de hoogte wordt gebracht van de doelprioriteiten van anderen.

In de huidige studies hebben we data verzameld over de eigen cognitie en doelordening. In de voorafgaande interviews bleek men ook van (enkele) anderen te weten wat voor cognitie ze hadden. Een vervolgstap zou zijn om data verzamelen waarbij medewerkers ook een inschatting geven van de

doelprioriteiten en de cognitie van relevante anderen binnen de organisatie (anderen binnen de afdeling, managers, andere afdelingen). Deze data geven aan in hoeverre men denkt te verschillen van anderen. En als men denkt andere houdingen ten opzichte van de verandering te hebben, of men inschat dat dat door andere doelprioriteiten of door andere causale cognitie komt. Zulke data zouden aangeven wat volgens medewerkers de *speltheoretische structuur* is. Dat kan verklaren welke strategie men kiest, zoals onderhandelen of informatie uitwisselen, en welke informatie men uitwisselt (alleen aansluitend bij de eigen voorkeur of volledige informatie).

Het hebben van dezelfde cognitie is gerelateerd aan zowel beter presterende organisaties (Reger et al., 1994; Markóczy, 2001), als aan minder goed presterende organisaties (De Dreu, 2006; Mooney et al., 2007). Wij stellen dat in de fase waarin nog een beslissing moet worden genomen over het invoeren van een organisatieverandering, discussie en informatieuitwisseling zinnig kan zijn. Als de doelprioriteiten van medewerkers nagenoeg gelijk zijn, is cognitief conflict in deze fase zelfs zinvol. Daardoor zullen meer argumenten worden uitgewisseld, waardoor mogelijke suboptimale beslissingen worden voorkomen. Als de verandering eenmaal wordt geïmplementeerd, is het echter nodig dat er steun is voor de verandering. Tegen die tijd moeten de cognities dus niet te ver uiteen lopen. In organisaties waarin de doelprioriteiten van medewerkers uiteen lopen, zullen cognitieve conflicten vaker leiden tot strategische informatie uitwisseling (aansluitend bij de eigen voorkeur), waardoor het conflict waarschijnlijk blijft. Daardoor zullen veranderingen worden tegengehouden of ze worden ingevoerd terwijl een deel van de medewerkers het niet steunt. In die gevallen zal de organisatie minder goed presteren. Als in toekomstig onderzoek naar het presteren van organisaties ons onderscheid van doelconflict en cognitief conflict wordt meegenomen, kan getest worden of onze aannames kloppen (en kunnen inconsistente bevindingen in de literatuur beter verklaard worden).

Hoewel we in dit proefschrift alleen data over organisatieveranderingen hebben geanalyseerd, kan onze aanpak ook nuttig zijn in andere gebieden waarin beslissingen moeten genomen (of worden gesteund) over beleid met gevolgen op doelen. Ook conflicten binnen huishoudens of in de politiek kunnen onze manier worden geanalyseerd. Zo zou door het vergelijken van de cognitieve

maps en de doelprioriteiten van politieke en van stemmers inzichtelijk kunnen worden gemaakt of de (potentiële) stemmers de partij steunen vanwege de ideologie (de doelprioriteiten) of vanwege het idee dat de voorgestelde praktische oplossingen zullen bijdragen aan de doelen (de cognitie).

Praktische implicaties

Als medewerkers dezelfde doelprioriteiten hebben, dan is het uitwisselen van alle informatie zinvol. Er is dan geen drijfveer om informatie achter te houden. Echter, groepsdenken licht op de loer. Als medewerkers dezelfde doelprioriteiten hebben, zullen ze als ze het idee hebben alles uitgewisseld te hebben en op één lijn te zitten, niet verder zoeken naar andere argumenten. Als benadrukt wordt dat men dezelfde doelprioriteiten heeft en als mensen met verschillende expertise bij elkaar in een team zitten, is de kans het grootst dat er veel verschillende informatie wordt uitgewisseld, en uiteindelijk gezamenlijk achter de uiteindelijke verandering staat.

De methode die we in hoofdstuk II hebben laten zien, kan gebruikt worden om te onderzoeken of er sprake is van cognitief conflict of doelconflict. Op basis daarvan kan beslist worden of meer discussie zinvol is. De aanpak uit hoofdstuk III kan gebruikt worden om te ontdekken welke punten met name nuttig zijn om in de discussie in te brengen.

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Organizational changes are often supported by some of the employees, while others oppose it. Proponents will expect the positive effects of the change to be greater or more important than potential negative effects. Do opponents expect these positive effects to be smaller, or do they find the positive effects less important than the negative effects? Are the consequences that people expect of organizational change related to their work department or their function? Are people who expect a great positive effect of organizational change on a particular goal also inclined to see positive effects on other organizational goals? And as supporters and opponents discuss, what information or arguments do they emphasize?

In this book these questions are answered by analysing so-called causal cognitive maps, capturing the individual expectations of the extent to which an organizational change will positively or negatively contribute to achieving certain goals. We introduce a measure to predict to what extent the individual will support or oppose the change, based on his cognitive map. This allows us to analyze which differences in the reasoning about the consequences of the organizational change particularly contribute to conflict whether or not to introduce the organizational change.

Timo Septer studied applied mathematics at Twente University. He conducted the research presented in this book as a member of the Interuniversity Center for Social Science Theory and Methodology (ICS) in Groningen.

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