Learning by Resistance:

An Analysis of Resistance to Change as a Source of Organizational Learning

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Thesis submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy

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October 2004

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Für meine Eltern

ABSTRACT

This research investigates how resistance to change can trigger organizational learning.

In order to structure the elusive concept of organizational learning, a framework is proposed that integrates processes of learning and memory at three levels of analysis. The framework identifies learning as cognition at the individual level, communication at the group level, and formalization at the organizational level.

The concept of resistance is introduced by delineating its development from a mere nuisance to the change effort towards a more recent functional understanding. Focusing on the diagnostic qualities of resistance, a functional analysis is employed that concentrates on the effects of resistance, namely its potential function as a source of learning. Informed by an analogy to acute pain, the process is then defined as a sequence of resistance, awareness, and organizational learning across three levels of analysis.

This process is examined in an empirical case study of a software implementation at the British subsidiary of a global manufacturing company headquartered in Germany. Methods and data used include personal interviews, repertory grids, and project documentation.

Results indicate limited resistance at the individual level, confined awareness at the individual and group level, and no organizational learning from this source. Resistance was suppressed due to a prevalent dysfunctional understanding of the concept among project participants and strong contextual factors, such as a success imperative, the inflexibility of the new technology, and a general disinterest in learning and bottom-up feedback. It is concluded that organizational learning by resistance depends on the understanding of resistance and on the culture of learning in the organization. The results suggest that not heeding resistance will have opportunity costs in the long run. The thesis concludes with hypotheses about the relationship between resistance and learning and its contextual influences.

ACKNOWLEDGEMENTS

While this thesis is the product of my own effort over a period of three years, it has benefited immeasurably from the attention, insight, and kindness provided by many advisors and friends. First of all I would like to thank my supervisor Martin Bauer for his skilled analyses and his experienced guidance on my doctoral journey. Especially his astuteness on the topic of resistance pulled together the different parts of this thesis and turned it into a coherent whole. My fellow comrades Russell Luyt, Kavita Abraham, Asaf Sharabi, and Ama de Graft-Aikens deserve much gratitude, not only for many engaging discussions and fascinating intellectual stimulation, but also for their friendship. They frequently helped me see the bigger picture and patiently endured my whining attacks. I thank Amy Edmondson for many helpful comments on the learning part, and for hosting my stay as a visiting fellow at Harvard University. Furthermore, this thesis benefited from the contribution of Bradley Franks, who reviewed several parts of it and competently challenged some key concepts. On a less content-driven note, I thank Raimund Schmolze for facilitating my move to London. Contributed to this work have also all the people at the commercial organization where I did my field study. To them I am greatly indebted for letting me intrude on their lives and ask questions about an uncomfortable topic. Finally, I owe praise to Monica for continually lightening up my days.

This research was made possible with financial support from the German Academic Exchange Service (DAAD).

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PREFACE

In this thesis, I investigate how organizations can learn from emergences of resistance to change. The research focus brings together two theoretical streams and combines them in a sequence that describes resistance as a source of learning in an organizational context. Consequently, the present study contributes to both the literatures on organizational learning and resistance to change.

A functional, that is resource-oriented, understanding of resistance depicts a fairly recent perspective, as the concept has traditionally been understood as an obstacle or mere nuisance in change processes. Organizations today have to deal with changes of a frequency, speed, and complexity never experienced before. This makes organizational change ubiquitous and resistance to change an equally omnipresent phenomenon. A common response by people in professional organizations that I have come across when introducing the topic of resistance is: "Oh yes, we have a lot of that in our organization. Some of my colleagues/bosses/employees just resist any change, no matter what it may bring to them. They often have to be forced to overcome their stubbornness/laziness/inertia." Such reactions immediately indicate three of the dominant limitations in past research on resistance; that is, the concept is treated as an individual level problem, an 'observing the other' perspective is adopted, and any informative potential is ignored by focusing entirely on overcoming resistance. In contrast, I examine resistance as a resource in change processes and explore how it can be utilized. Resistance is treated as an independent variable and is analyzed for its downstream effects.

The effect of interest in this thesis is organizational learning, a concept of increasing popularity in recent years. In the popular domain the term 'learning' seems to currently be used as a panacea for all sorts of maladies. The idea of lifelong learning is promoted as a sheer necessity in the coming information age. The label 'learning' is attached not only to organizations, but also to even larger entities. For example, the UK Department of Education and Skills (2004) endorses 'learning cities' with the goal of a 'learning society', while the German Ministry of Education and Research (Bundesministerium für Bildung und Forschung, 2004) sponsors 'learning regions'. 'Organizational learning' on the other hand stands for a concept that is largely confined to the academic domain. Here, internal processes and influences are the center of attention in order to answer the question how organizations might learn. As in the case of

individuals, organizations need input to trigger learning, an ideally informative stimulus that functions as a source of learning. Combining the two theoretical streams, the present study analyzes resistance to change a source of organizational learning. For this purpose, the following chapter structure was developed.

The first chapter is dedicated to the topic of organizational learning. An overview of the organizational learning literature is provided initially. Different concepts are explored, which results in the conclusion that there is little convergence on a comprehensive theory of organizational learning. Given this conclusion, the question of what might constitute organizational learning is systematically analyzed. Deriving from characteristics of original learning curve research, I emphasize the necessity to treat learning as a process (instead of an outcome) and to not equate learning with subsequent performance. The procedural perspective enables the identification of agents of learning (who does the learning?) that operate on three different levels in the organization. In consequence, learning and memory, as crucial constituents, are discussed for the levels of the individual, the group, and the organization. It is argued that any procedural conceptualization of organizational learning will be incomplete without the described elements. On the basis of an assessment of the limitations of earlier process models, an integrated framework of learning across three levels of analysis is proposed as the point of origin for the empirical assessment.

Resistance to change is introduced as the second theoretical stream of this thesis in the second chapter. Examining resistance reveals different components, namely actors, objects, conditions, manifestations, and perspectives, all of which are discussed in detail. The treatment of resistance in academic and management discourse over the past few decades is recapitulated to depict a research trajectory that stretches from a dogma of overcoming towards a recent awareness of the diagnostic qualities of resistance. Hence, a shift in analysis from causes to effects is identified that allows for a reconceptualization. Understanding resistance functionally, informed by an analogy to acute pain, facilitates an analysis of its role as a potential source of learning. A sequence of resistance-awareness-learning is proposed as the focus of inquiry. The following research question is stated: *How can an organization learn from resistance to change?*

A methodology for the empirical part of this thesis is presented in the third chapter. The research strategy chosen is an empirical case study of an organizational change project, comprising data from interviews, repertory grids, and the project documentation. Different types of data are matched with the components of the research focus. While the case study method is the research strategy, the research design is a non-experimental field study with the purpose of theory building in an exploratory approach. Various quality criteria concerning the methodological choices are discussed. The organization under study is a global manufacturing company headquartered in Germany. The actual change project that is analyzed is the implementation of SAP software in conjunction with the closure of the distribution warehouse at the company's UK subsidiary. A detailed account of the methods used and of the actual proceedings of data collection and analysis is provided.

In the fourth chapter I present the results of the empirical study. First of all, certain characteristics of the results are shown. A word count on the interview data illustrates the dominance as well as the relative absence of certain themes over others. The project documentation is examined for production dates and task frequency across the duration of the project. The chapter is then divided according to the components of the research focus into four parts on resistance, contextual factors, awareness, and learning. Whenever possible a distinction is made between the three groups involved in the project, German managers, British managers, and British employees. Data from interviews, repertory grids, and the project documentation are combined on all variables of the research focus. Resistance in the project is described briefly as the initial stimulus of an expected learning sequence. Contextual factors were found to be a strong influence in the project, and they are described in detail for various content areas. Finally, results on awareness and learning, which are split according to the three levels of analysis, are presented.

The fifth and final chapter contains a discussion of the obtained empirical results in the light of the theoretical assumptions made in the first two chapters. I reappraise the research question of how an organization can learn from resistance to change by revisiting the results and by paying specific attention to the proposed sequence of resistance-awareness-learning at three levels of analysis. As a result, limits of the analogy to acute pain are identified and some assumptions are made about the opportunity costs of not

heeding resistance. In the second part of the chapter, the findings pertaining to the integrated framework of learning and memory are elucidated and used to assess the strengths and weaknesses of this model. The remainder of the chapter is then devoted to concluding reflections on the research process, limitations, and considerations for further research.

1 ORGANIZATIONAL LEARNING

"Learning is a crucial activity in a human culture. [...] Learning is the mechanism by which organisms can adapt to a changing and nonpredictable environment" (Anderson, 1995, p. 1). In any given textbook on learning, fundamental statements of this kind introduce the reader to the topic and illustrate the basic idea that learning is something good and desirable, and that essentially positive qualities and outcomes are attributed to it. Learning has been the key issue of psychology ever since its inception as a scientific discipline. Originally preoccupied with an interest in individual learning, psychologists and organizational researchers paid attention to the question how people learn in collectivities only much later. Today the topic of organizational learning receives increasing attention from many different areas (Bapuji & Crossan, 2003). Some authors already criticize the topic for its common appeal, because the popular and academic discourse might be too all-embracing, thereby glossing over important intricacies and connotations (Contu, Grey, & Örtenblad, 2003). Partly due to the widespread use of the concept, it is often unclear what organizational learning supposedly stands for and what purpose it serves. In addition, the relative clarity about the processes involved in individual learning cannot be found in research on supra-individual learning.

In this chapter I first seek to illustrate the functionality of learning in organizations. An extended literature review reflects on the terminology and perceptions of organizational learning as well as on important characteristics of the concept. Following a search for comprehensive theory, organizational learning is then examined for its necessary internal processes, which will be identified and consolidated.

1.1 THEORETICAL BACKGROUND

A brief overview of the concept of organization will provide a foundation for the pursuit of the question how organizations learn. As the field of organization studies has seemingly little paradigmatic consensus, definitions of organizations differ on important conceptual issues as well as methodological approaches to study them (Pfeffer, 1993). However, there are some essential points of agreement that either stem from the basic nature of a statement or the dominance of some theoretical framework. Emphasizing the latter I will use open systems theory (Katz & Kahn, 1978) as an initial point of entry.

At the most basic level formal organizations can be understood as entities, which transform, or support the transformation of, some form of input into some form of output. As such, this coordinated, that is *organized*, transformation process represents the basic purpose of the organization (Duncan & Weiss, 1979). A transformation perspective implies some form of boundary that segregates the organization from its environment, while allowing the organization to operate input-throughput-output processes as an open system (Katz & Kahn, 1978). Hence, boundaries must be permeable, with the permeability to some degree under the control of the organization. Boundaries facilitate an internally and externally perceived identity, a logo, a name, a public appearance as a unit, and a legal status.

An instrumental perspective proposes that organizations are aimed at achieving some goals or purposes (Beehr, 1995; Scott, 1992), they are target-oriented and seek to obtain certain objectives that could not be achieved through individual action alone (Pfeffer & Salancik, 1978, p. 23). The first and foremost goal organizations pursue appears to be their own survival or self-perpetuation. Given that organizations operate in changing and often competitive environments, they require constant adaptation in the form of a dynamic homeostasis to maintain their steady state. This need for constant adaptation arises not only from a changing environment but also from a natural tendency for organizations to become disorganized, a principle that Katz & Kahn (1978) borrow from the natural sciences, namely negative entropy. Underlying the constant adaptation is also a desire to maintain efficiency in the input-throughput-output cycles.

If an organization's crucial goals are adaptation and efficiency, learning seems to be indispensable in accomplishing them (Dodgson, 1993). While other factors such as motivation might certainly be influential, learning encompasses the essence of the goals depicted above. Nicolini & Meznar (1995, p. 738) rephrase this by asking the question whether organizations can ever '*not learn*' in the pursuit of their goals? Their answer to this is 'No', especially when organizations are symbolized as "the product of thought and action of their members" (Gioia & Sims, 1986, p. 1) or "the body of thought thought by organizational thinkers" (Weick, 1979, p. 2), which adds the notion of meaning systems and deliberate interpretation to the open systems concept (Daft & Weick, 1984). Thus learning seems to be a continuous process inherent in organizations. Adapted to commercial environments, organizations can also be seen as social communities specializing in speed and efficiency in the creation and transfer of knowledge

(Kogut & Zander, 1992, 1996). In sum, the bulk of the psychological and management literature sees learning as the highest form of adaptation, raising the probability of survival in changing environments (Anderson, 1995; Houston, 1991) and increasing efficiency in producing desired outcomes (e.g., Cyert & March, 1963; Donaldson, 1995; Senge, 1990a).

After these initial assumptions about the 'positivity' of learning, the next step will be to examine specific instances and reasons, that is, to explore the potentially functional values of learning for organizations. Shrivastava (1983, p. 10) presents a schematization of different perspectives on organizational learning. Following and extending his thoughts, the categories introduced in the subsequent paragraphs represent new developments in the literature and more strongly emphasize the functional values of organizational learning in order to develop an argument for further analysis of internal processes.

1.2 PERCEPTIONS OF ORGANIZATIONAL LEARNING

Pfeffer's (1993) conclusion that there is little consensus in organization studies in general seems to hold for the topic of organizational learning specifically. There are various viewpoints depending on the theoretical background of the viewer, as will be elaborated later. Scholars conceptualize learning, individual and organizational, using different perceptions, which correspond to different fields of interest. These perceptions describe learning primarily in non-procedural terms (i.e. outcome-focused) and should probably be understood as complementary to one another.

1.2.1 Learning as adaptation

Organizations are not isolated entities that perform under stable inner and outer conditions. Instead, they are subject to constant environmental and technological changes which force them to interact in an increasingly adaptive manner in order to survive. Employing established evolutionary theories, this is not a new idea. Continual experimentation and adaptation to a changing set of circumstances together resemble the mechanism that governs the survival of every organism on the planet, as sketched out

by Charles Darwin. By adding deliberate intention, this Darwinian approach is only a short step from describing learning, although learning need not necessarily be intentional (Bower & Hilgard, 1981; Huber, 1991). Yet learning inherently includes and facilitates potential adaptation. As Hedberg (1981) remarks, this adaptation can be performed in two directions, as defensive adjustment to reality and as offensive improvement of the fit between the organization and the environment. Organizations may also shape their environments, as in the case of Microsoft Corporation setting de facto industry standards for computer operating systems in the late 1980s and early 1990s. This, however, seems to be a somewhat rare exception to the rule (Davis & Powell, 1992).

Mainstream contingency theory focuses on the alignment between the organization's inner structures and outer environment. As such, the organization ideally must be designed to meet the demands of its environment (Duncan & Weiss, 1979). In this view, organizational learning becomes the process of identifying environmental changes and organizational contexts, and successfully coping with them; a clearly reactive or even passive view of organizational nature. Other theorists, however, criticize the contingency approach for its unrealistic dichotomization of organization and environment, and emphasize the importance of aligning the internal environment while stressing the interpretive nature of the external environment (Pondy & Mitroff, 1979; Weick, 1979). Those authors that consider a middle position face the question which fit is most important, as it might be unattainable to simultaneously achieve internal and external fit (Miller, 1992). A third approach, population ecology, abandons the concept of organization-environment fit altogether and argues that organizations have a very limited stake in assuring their own survival. Instead, success or failure is determined entirely by environmental forces in the form of a selection by agents such as the world economy, competition, or customers (e.g., Hannan & Freeman, 1988).

From a management science perspective, learning is seen as a purposive, adaptive endeavor to retain and improve competitiveness, productivity, and innovativeness in uncertain technological and market circumstances (Applebaum & Gallagher, 2000; Boerner, Macher, & Teece, 2001; Chaston, Badger, & Sadler-Smith, 2000; Cyert & March, 1963; de Geus, 1988; Dodgson, 1993; Dumaine, 1994; Hodgson, 1995; Senge, 1990b; Stata, 1989; von Rosenstiel & Koch, 2001). Strategically, the basic line of thought is that competitive battles are won by organizational capability rather than new products, resources, or market position (Hedberg & Wolff, 2001). The greater the uncer-

tainties, the greater the need for learning (Levinthal, 1991). In that sense, learning might provide the underlying theme for a Darwinian approach to organizational survival.

1.2.2 Learning as comprehension of complexity

Organizations encounter increasing complexity within and outside their boundaries. In an age of mega-mergers and continuing diversification, even the main parameters of an organization's inner and outer environment might become hard to comprehend. In this light, organizational learning can fulfill a number of functions: It can provide a means of orientation and uncertainty avoidance (de Geus, 1988; Galer & van der Heijden, 1992; Huber, 1991; Wenzler & Chartier, 1999). It can be an essential tool in understanding history or the effect of historical developments on the present (Busby, 1999; Levitt & March, 1988). It can contribute to the efficacy of information dissemination (Argote & Ingram, 2000; Isaacs, 1993; Nonaka, 1994; Schein, 1993). And it can support the formation and shaping of a common organizational culture (Kofman & Senge, 1993; Nicolini & Meznar, 1995; Sonntag, 1996; Weick & Westley, 1996). Therefore, over and above the perception of organizational learning as an adaptive mechanism, it also appears to provide coping resources in the management of complex environments.

1.2.3 Learning as knowledge creation

A paradigm of traditional organizational theory is the view of the organization as a system that *processes* information. But, as Nonaka (1994) notes, such a view focuses almost exclusively on the concept of what is *given* to the organization without due consideration of what is *created* by it. Organizations create knowledge, both declarative (i.e. facts) and procedural (i.e. know-how, scripts), or explicit and tacit - and they do so by means of learning (Nonaka, 1994). While the validity of the produced knowledge might be called into question in many cases, learning and knowledge creation usually increase an organization's capacity to perform (Tsang, 1997). In addition, from an economic perspective knowledge as a form of capital, if compared to other forms (i.e. land, equipment, labor and money), is theoretically infinite (McElroy, 2000).

1.2.4 Learning as intelligence and innate behavior

Considering its adaptive and productive qualities, organizational learning can also be understood as a form of intelligence. Levitt & March (1988) note this aspect in their elaboration of learning from experience, yet at the same time the authors caution that "learning does not always lead to intelligent behavior" (p. 335). But if learning is compared with other serious alternatives like bargaining or selection, those seem to be much more error prone, leading to the conclusion that although intelligence in learning is often frustrated, it nevertheless occurs rather frequently.

Finally, building on the notion of man as *homo sapiens*, a wise and knowing species, a desire to learn and explore is innate to human beings (Houston, 1991). Even though this last argument does not generate a case for a specifically collective or organizational form of learning - after all, the need to explore and experiment could also be satiated individually - it sheds light on the predominant orientation of most commercial organizations towards controlling rather than cultivating their members' natural curiosity and impulse to learn (Senge, 1990b).

In summary it can be concluded that organizational learning evokes a number of different perspectives, and can be attested some important positive outcomes. This is reflected in the raised interest the topic has received in the academic community while at the same time becoming a 'buzzword' in management literature. In a bibliographic review Crossan & Guatto (1996) show that as many academic papers on the subject were published in 1993 as in the whole decade of the 1980s. The rise from 3 articles in the 1960s, 19 in the 1970s, 50 in the 1980s through to 184 in the 1990s (up to only 1994) significantly outpaces the overall rise in publications during that entire time period. In a follow-up study, Babuji & Crossan (2003) report a 25-fold increase in publications on organizational learning between 1990 and 2002. Moreover, in terms of management semantics, the subject obtained some rather dramatic emphases such as: "The rate at which organizations learn may become the only sustainable source of competitive advantage in business" (Stata, 1989, p. 64) or "the ability to learn faster than competitors may be the only sustainable competitive advantage" (de Geus, 1988, p. 71).

After the introduction of different general perceptions of organizational learning, a descent from the meta-level towards the description of specific key characteristics will complement the literature review in the following.

1.3 CHARACTERISTICS OF ORGANIZATIONAL LEARNING

In addressing defining characteristics of the construct under investigation, an outline of the ideas behind key descriptive terms is necessary. The ongoing discussion is not a sterile academic debate but involves active participation from scholars representing a diverse range of disciplines and cultures (Bertoin Antal, Dierkes, Child, & Nonaka, 2001b), which will be elaborated later. Although there is disagreement about various components, a strong effort towards consensus building could channel research into new areas without having to constantly reinvent the wheel. Maier, Prange & Rosenstiel (2001) also remind scholars of inherent ramifications for empirical work, as many definitorial approaches seem impossible to operationalize. Given that definitions of organizational learning are subject to controversy and flux, the following pages comprise a collection of defining characteristics rather than depict a concise definition (for earlier reviews of definitions of organizational learning see Fiol & Lyles, 1985; or Prange, 1999). The quest for a definition or theory consensus will then be discussed afterwards in section 1.4.

1.3.1 Organizational learning vs. the learning organization

As the notion of organizational learning was taken on by the prophets of practical management theory, an interest in the defining elements of the concept, applied to the real world, emerged under the label 'the learning organization'. A decisive introductory moment, especially for professionals in the management consulting industry, was certainly the publication of Peter Senge's *The Fifth Discipline* (1990a), spreading the word of an alleged new vision in management thinking. Since then the idea of the learning organization has led to the creation of numerous guides and practical handbooks, and for a number of years there has been a growing dichotomy between two streams of research.

Although sometimes used interchangeably, the terms 'organizational learning' and 'learning organization' represent distinctly different concepts, illustrated by the underlying questions "How does an organization learn?" versus "How should an organization learn?" (Tsang, 1997). The literature on organizational learning is analytic and concentrates on understanding learning processes within organizational settings. It employs a descriptive approach and portrays certain types of activities that take place in an organization, without necessarily trying to change those activities. Moreover, although there is a paucity of descriptive studies, the existing studies generally apply agreed-upon methodology and are scientifically rigorous in their designs. In contrast, literature on the learning organization is mostly action oriented and attempts to create an ideal type of organization, one in which learning is maximized (Easterby-Smith, 1997). Thus, a learning organization is one that is good at organizational learning, even though this might obfuscate entity with process. With practitioners as targets, writings are prescriptive and provide practical guidelines, often based on the authors' own consulting experience (Garratt, 1987). As such, the illustrated examples and more so the ensuing generalizations seldom follow rigorous research methodologies, but provide ex post facto interpretations that are often either vague or of doubtful validity. Moreover, case studies based on action research, where consultants systematically study the consequences of changes and initiatives that they themselves participated in generating, might not provide a sufficient degree of objectivity when it comes to reporting strong critique of methods and outcomes. As Easterby-Smith (1997) notes, much of the work emitted from MIT's influential Center for Organizational Learning falls into this category. A last point worth mentioning is that authors in the realm of the learning organization draw heavily from the organizational learning literature while this is not the case vice versa, further indicating the difference in targeted audience and message content between the two streams.

Positioning the present work in respect to the two dominant perspectives of the topic, this thesis is placed within the organizational learning approach.

1.3.2 Types of learning

A number of researchers have identified different kinds of organizational learning and attempted to categorize them with varying cluster labels. Since these terminologies are often inconsistent and lead to confusion when comparing different concepts, the use

of Pawlowsky, Forslin & Reinhardt's (2001) classification terms is proposed here. These authors coherently distinguish between learning *level*, learning *type*, and learning *mode*. The learning level represents what will be described later as level of analysis, that is, individual, group, and organization. The learning mode differentiates between cognitive and behavioral learning (in addition, Pawlowsky et al., 2001, list cultural learning). Types of learning are the subject of this paragraph.

Scholars in the field have recognized various types of organizational learning. The approaches stem mainly from the realms of management science and organizational development, and differentiate between intensities of learning. Some persuasive concepts receive both widespread acceptance in the academic literature and unmistakable appeal to professional contexts, especially management consulting (Schmolze, 2000).

The latter observation receives ample verification in the work of Argyris & Schön (1978). These authors elaborate Bateson's (1972) description of two 'levels' of learning (i.e. types in our terminology), that is learning skills within a context and learning how to learn. They develop a three-fold typology of learning that is bound together by a theory of action and integrates the stages single-loop, double-loop and deutero-learning.

Single-loop learning describes a process that maintains the central features of an organization's 'theory-in-use' (actual rules used to manage an organization's beliefs) and restricts itself to detecting and correcting errors within that given system of rules. Single-loop learning stands for an adaptation to present problems, but it does not solve the more basic issue of why these problems exist in the first place. A practical analogy to this is a thermostat. It detects the temperature of the surrounding air and turns the heat on or off when it gets too cold or too warm. It does not, however, address the question why the temperature changed beyond the acceptable range.

In contrast, double-loop learning occurs when an error is detected and corrected in ways that involve modification of an organization's underlying norms, policies and objectives. This form of learning challenges and alters the theories-in-use. Fundamental values and assumptions, which govern the stated goals, come to the surface and are changed. Extending the thermostat example, double-loop learning has taken place when the thermostat is, for example, recalibrated as opposed to simply having it limit the amplitude size of temperature changes.

Deutero-learning differs to some extent from the other two forms as it pertains to the need for organizations to learn how to carry out single and double-loop learning. It

consists of inquiry into the learning system by which an organization detects and corrects its errors and therefore occupies some meta-level. Swieringa & Wierdsma (1992) adopt Argyris & Schön's first two stages, but replace the idea of learning to learn with their concept of triple-loop learning. This happens when the essential principles on which the organization is founded come into question, when doubts are raised about the role it aims to fulfill and the identity it has.

Similar types of organizational learning, resembling those put forth by Argyris & Schön (1978), are postulated by other authors. Hedberg (1981) provides three types of learning based on stimulus changes in the organization-environment relationship that he labels adjustment learning, turnover learning, and turnaround learning. While the former two correspond to single and double-loop learning, the latter is closer to the triple-loop concept.

The single versus double-loop dichotomy and its inherent ideas are also found in Miles & Randolph's (1980) differentiation between reactive and proactive learning, Fiol & Lyles' (1985) lower and higher level learning, Dutton & Jackson's (1987) behavioral level and strategy level learning, and Senge's (1990a; 1990b) suggestion of adaptive and generative learning[1]. Fiol & Lyles (p. 810) list generic characteristics that encapsulate the main ideas from the concepts illustrated above (*Table 1.1*). Again, what Dutton & Jackson and Fiol & Lyles originally labeled as 'levels' corresponds to 'types' in Pawlowsky et al.'s (2001) classification. In utilizing an inherent assumption of different stages of increasing sophistication and complexity, the types listed here propose a hierarchy of learning with evolutionary connotations, an assumption of progressively desirable learning stages.

A learning type that has a somewhat unique status is *unlearning*. It is recognized that knowledge sometimes disappears from an organization's active memory, it is no longer used. Given Hedberg's (1981, p. 18) definition of unlearning as "a process through which learners discard knowledge", emphasizing a functional and perhaps intentional notion, organizational unlearning can be classified as yet another type of organizational learning (McGill & Slocum, 1993; Nystrom & Starbuck, 1984).

[1] For a list of concepts reflecting the single- versus double-loop dichotomy see Pawlovsky (2001, p. 77)

Table 1.1: Types of learning

	Lower-level*	Higher-level*
Characteristics	Occurs through repetition	Occurs through use of heuristics and insights
	Routine	Non-routine
	Control over immediate task, rule and structures	Development of differentiated structures, rules, etc. to deal with lack of control
	Well-understood context	Ambiguous context
	Occurs at all levels in organization	Occurs mostly in upper levels
Consequence	Behavioral outcomes	Insights, heuristics, and collective consciousness
Examples	Institutionalizes formal rules	New missions and new definitions of direction
	Adjustments in management systems	Agenda setting
	Problem-solving skills	Problem-defining skills
		Development of new myths, stories, and culture

*the term 'level' corresponds to 'type' in the terminology adopted from Pawlowsky et al. (2001)

Advocates of unlearning are concerned that redundant and unsuccessful content of memory might compromise organizational decision processes, especially when faced with rapid environmental change. As a result, organizations are advised to treat their memories as enemies at times (March & Olsen, 1979), collectively identify and remove inherited cultural obstacles to creating a learning organization (Finger & Brand, 1999), or abandon outlived conventional environments (McGill & Slocum, 1993). Following this advice, it is worth noting that unlearning can lead to a reduction in (potential) behaviors or to a reduction of constraints on (potential) behaviors, resulting in either a decrease or increase in subsequent behavioral outcomes. In relation to outcomes, Huber (1991) differentiates between temporal inactivity, initiation for a focused search for substitutes of the unlearned content, and new learning as effects of the unlearning process.

As organizational learning is an activity essentially made up of individuals – an assumption that will receive more attention later in sections 1.6 and 1.7 – a radical form of deliberate unlearning is the dismissal of members of the organization. However, accommodating new members also entails individual unlearning as part of the socialization process, resulting in loss of information the new members possess upon entry (Huber, 1991). The hint of organizational learning and unlearning as a function of personnel selection and socialization receives attention in March (1991), who identifies two trajectories within the socialization process: The organizational code of received truth is learning from the beliefs and practices of individuals, and individuals are learning the

organizational code. This mutual adaptation enables individuals to grow into the organization by learning the code, and the code is developed by individuals who initially deviate from it. Therefore, it can be concluded that there is a system-level, long-term advantage in slowing socialization to the code, but an individual-level, short-term advantage in fast socialization.

As much as unlearning might be favored from an adaptive, evolutionary perspective on organizational learning, the crucial role of intelligent decision formation and implementation based on sound memory content needs to be strongly highlighted. Integrating both points of view, Hedberg (1981, pp. 19-20)) concludes:

> "Balances between organizations' abilities to learn and to unlearn appear necessary for long-term survival. Unlearning abilities are needed in order to make room for more adequate interpretative frameworks and responses in organizational memory. Learning abilities are needed to generate new knowledge and to adjust and update existing knowledge."

This integrative aspect has been elaborated in later works, and Klein (1989) argues that the original unlearning model has too strong a focus on discarding knowledge altogether instead of adequately transforming it. This idea is reflected in the concept of absorptive capacity, the ability of an organization to harness its prior related knowledge, to recognize the value of new information, and then to assimilate and apply it (Cohen & Levinthal, 1990).

1.3.3 Organizational learning and organizational design

Organizational design creates, develops and often dictates communication and interaction within an organization and across its boundaries. It is the "allocation of resources and people and the structuring of the organization to carry out its objectives" (Duncan & Weiss, 1979, p. 103). Since the structure of an organization is found to have decisive effects on the interaction of its members, various scholars have examined the topic in order to determine which types of organizational design inhibit or enhance organizational learning.

Embedded in the basic organization-environment fit paradigm, Duncan & Weiss (1979) study the relationship between learning, strategy and design (see *Figure 1.1*). Although learning is not required for strategy formulation and design, the ideal process sees organizational learning as providing knowledge to devise a strategy that is respon-

sive to a particular task environment. Knowledge generated through learning, in combination with strategic objectives, then both affect the design to be implemented. A design that emerges out of such a process will sustain organizational effectiveness by enabling attainment of goals and objectives, adaptation to the environment, and role clarification for individuals.

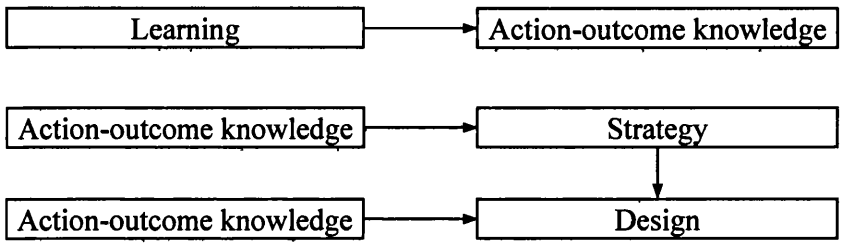


Figure 1.1: Relationship between learning, strategy, and organizational design

If resulting designs are based in part on knowledge about action-outcome relationships, the causal inference that a particular action leads to a particular outcome can be corroborated. But since organizations consist of many individuals, actions of single individuals are embedded in an ecology of the actions of many others, obscuring the attribution of causes to effects. In order to decrease interaction effects in complex organizations, departmentalization or sequential attention allows for the examination of local consequences (Levinthal & March, 1993). However, such segregation often entails loss of awareness of the bigger picture. One way to combat this is tight coupling of the system, keeping short linkages with few buffers, redundancies, and possible delays, as in just-in-time inventory systems for example. The argument in favor of tightly coupled systems is that such structures enhance learning by making problems, arising through ongoing operations, more visible and observable.

Bringing the two perspectives together, the function of loose coupling in order to examine consequences and confirm action-outcome relationships seems to contradict the function of tight coupling to augment problem detection. Levinthal & March (1993) suggest that loosely coupled systems make locally confined diagnostics easier while tightly coupled systems are better for system-wide error detection. Striking a balance between the two strategies apparently depends on the frequency of errors and the difficulty of diagnosis.

The recognition that certain structures are more conducive to learning than others implies a recommendation to always conduct the design process with the objective of maximizing organizational learning potential. On this note, Shrivastava (1983) categorizes six different types of learning systems and examines their characteristics and ramifications. He uses the term learning systems to indicate the mechanisms by which learning is perpetuated and institutionalized in organizations. In differentiating between one man institutions, mythological learning systems, information seeking cultures, participative learning systems, formal management systems, and bureaucratic learning systems, he discusses each system's idiosyncrasies and proposes a typology for further research. Shrivastava concludes on the notion that the learning capabilities of an organization can be enhanced by deliberate and knowledgeable design processes.

Elaborating on aspects of design, it should be noted that there are limits to formalized structure. Official organigrams, standard operating procedures, and recognized job descriptions often obscure the actual practices of organizational members. Brown & Duguid's (1991) arguments about informal communities-of-practice, which account for a substantial amount of the learning and innovating activities in organizations, emphasize this point. By recognizing the many noncanonical communities in its midst and reconceiving of itself as a community-of-communities, especially large organizations can, in this view, accommodate learning-in-working and spur innovation.

The idea that structure is an outcome of learning, however, must be challenged by the considerations of macro organizational theory. According to Fiol & Lyles (1985), centralized and decentralized decision-making structures have very different impacts on the organization's learning ability. Centralized structures often reinforce past behavior, while decentralized structures permit the assimilation of deviant behavior. Certain organizational forms, such as self-designing organizations or adhocracies, are particularly good at adapting to changing environments, fostering creativity, and innovating in response to environmental demands. Others, such as bureaucracies, excel at managing the status quo and exploiting the efficiency potential of standardized procedures. Crudely stated, self-designing organizations learn, while bureaucracies organize (Weick & Westley, 1996). The latter statement, however, needs to be attenuated, since the exploitation of efficiency potential is also a form of learning, as will be elaborated further below.

Taking into account all different perspectives, there seems to be a reciprocal relationship between organizational learning and organizational design. Knowledge acquired though learning influences the design process, and design affects the learning process.

1.3.4 Limits and cautions of learning

Organizations that move beyond the founding stage and mature generally try to learn from experience (and they often fail in doing so). They devote considerable energy into developing understandings of experience and history. But historical events or critical incidents tend to be rare and infrequent, which renders as the basis of learning a very small sample of experience (March, Sproull, & Tamuz, 1991). Learning from fragments of history can be improved by attempts to experience history richly. Such approaches include experiencing more aspects of events (e.g., intensive focus on critical incidents), more interpretations (e.g., by multiple observers), or more preferences (e.g., modifying aspiration levels). Simulating experience is another form of supplementing history by creating near or hypothetical histories. Such histories draw on a richer, less polarized set of interpretations, but they are error-prone due to their imaginary nature. However, in both cases of enhancing learning from historical events, issues of reliability and validity are under question, and they should be considered in any interpretative effort.

Organizations consist of individuals that balance community and altruistic motivations with personal aspirations. As individuals or groups within organizations compete for scarce resources and positions, a micro political perspective on learning must be considered. This mostly sociologically influenced view focuses on the question why in some cases organizations *don't* learn. The essential argument states that an unhindered transfer of knowledge is politically naive because knowledge and information are vital resources of power in organizations (Child & Heavens, 2001; Kluge & Schilling, 2000). Since the prototypes of the learning organization advocate a decrease of rules and formalized structures in exchange for free exploration and interaction, political activity is likely to increase in such cases (Kanter, 1989).

The micro-political perspective emphasizes relations of hierarchy and power, and points to conflicts over interests, beliefs, and resources. In modern organizations, the link between power and expertise has been often decoupled. Recognizing that skills and

imaginations are intertwined with social and institutional structures, scholars have proposed a study of power as both the ongoing product and the medium of collective activity (Blackler & McDonald, 2000). Taking the power issues as a given, Coopey & Burgoyne (2000) argue that organizational learning can be facilitated by a free and open form of politics in the workplace, and call for a framework of legitimate authority that regulates interaction.

In addressing the general problem of governance, Coopey (1995) questions the egalitarian assumption and asks who will determine the overall direction of the learning organization, who will 'call the shots' in the end, and whose knowledge should be privileged over others'? In addition, Coopey (1995) envisages the danger that organizational learning can be misused as simply another tool to spread the ideology of commitment and motivation, to exert power in the organization through strong ideological pressures (see Victor & Stephens, 1994, for a general discussion of the negative aspects of new organizational forms). In sum, internal politics must be taken into account as strong influential factors in devising any strategic learning and change objectives as well as in any discussion of procedural aspects of organizational learning.

The adaptive processes that underlie one possible rationale for organizational learning sustain two opposing strategies for gaining competitive advantage and ultimately survival. Organizations can explore their environments, develop new ideas, search for new markets, and experiment with new alternatives. Conversely, they can refine existing technologies, extend proven competences, optimize production efficiency, and improve traditional paradigms.

In the latter case of an *exploitation* strategy, frequent use of confirmed routines might increase the relating competencies and successful outcomes, which will result in an even more frequent use. This course of action, however, can ignore new developments and lead to competency traps, which occur

> "...when favorable performance with an inferior procedure leads an organization to accumulate more experience with it, thus keeping experience with a superior procedure inadequate to make it rewarding to use." (Levitt & March, 1988, p. 322)

Competency traps are sensitive to learning rates, which leads to the assumption that fast learning might not be desirable under all circumstances because it can result in

maladaptive specialization[2]. A classic example of the negative long-term consequences of an over-reliance on distinctive competence is provided in Abernathy & Wayne's (1974) account of Ford's pursuit of efficient production of the Model T. The company achieved considerable efficiency and cost reduction concerning this car, but met extraordinary difficulties in the transition to a new model, which required amongst other things the closing of a manufacturing plant for several months. On a broader level numerous examples of the competency trap concept, such as the QWERTY typewriter keyboard or the internal combustion engine, provide ample support for the transformation of seemingly suboptimal technologies into industry standards and stable arrangements (Dierkes, Hoffmann, & Marz, 1996; Levitt & March, 1988).

On the other hand, *exploration* strategies run the risk of uncertain returns, longer time horizons, and more diffuse effects. Exploration is a key determinant of long-term intelligence, but reduces the speed at which skills in existing alternatives are improved.

March (1991) discusses the trade-off between exploration and exploitation in detail. He presumes that because of its mostly positive, proximate, and predictable returns on allocated resources, exploitation is in most cases the more attractive alternative for organizations. But while refining exploitation strategies might produce positive outcomes in the short run, a sole reliance upon this alternative is likely to be self-destructive in the long run. In order to attain an optimal mix of exploration and exploitation, Levinthal & March (1993, pp. 107-109) offer strategies for sustaining exploration that operate on either incentives, organizational structure, individual beliefs, or selection processes. Their ideas include assigning property rights to successful search activities, designing new venture subunits, influencing risk preferences, and increasing the sampling of failure performances in internal selection. Employing a group-level perspective, Edmondson (2002) suggests that certain types of teams might be predominantly active in one of the two domains, often as a function of their role description. Development teams, for example, are prone to explore, while production teams are more likely to exploit.

Two more difficulties of organizational learning are addressed in Levitt & March's (1988, p. 325) paper. The appraisal of any learning process depends on the

[2] The detrimental effects of fast socialization of new organizational members, a form of fast learning, have been identified in the discussion of unlearning.

evaluation of outcomes as successes or failures. Successes are typically defined in terms of the relation between performance outcomes and targets. This carries an inherent problem because targets change over time in that either the indicators of success are modified, or levels of aspiration vary. Looking at the ambiguity of success from a different perspective, a cycle of events is imaginable where success generates confidence, which augments over-generalization of experience (i.e. no external validity). This might result in a subsequent lack of seeking new experience, and thus ultimately in failure. Miller (1994) identified inertia as an often unintended consequence of successful performance. Inertia, defined as an "inability for organizations to change as rapidly as the environment" (Pfeffer, 1997, p. 163), arises as successful organizations abandon factors regarded as peripheral to success. Subsequently, they become more inattentive to change indicators, less self-reflexive in their processes, and overly simplified in their adaptation.

On the other hand, experiencing failure can also result in inappropriate action, leading to more failure (Kieser, Beck, & Tainio, 2001). In times of organizational crises, probable centralization of authority and low levels of risk taking can lead to an increase in organizational rigidity that is likely to result in resistance, conflict, and defensiveness. As these dynamics instill fear and paralyze management, the failure becomes highlighted and will set off further rounds of failure and unrewarding change. In order to avoid such developments, strong arguments about explicitly analyzing and learning from failures are being made (Klein, 1989; Levinthal & March, 1993).

Another misinterpretation problem is superstitious learning. It occurs when the subjective experience of learning is compelling, but the connections between actions and outcomes are misspecified. In such instances, a specific positive or negative outcome is attributed to the adoption or abandonment of a particular routine when, in fact, there is no causal relationship whatsoever. The subjective feeling of learning might be powerful, but it is misleading (Levitt & March, 1988).

In summarizing some of the difficulties above, Levinthal & March (1993) provocatively spell out three problems of 'learning myopia': The tendency to overlook distant times, distant places, and failure. Organizational learning repeatedly seems to favor the short run, ignore the larger picture, and privilege only the lessons gained from success, as was shown above. Although learning, therefore, is less than a panacea for organizations, the imperfections of learning should not be misunderstood as reasons to

abandon attempts to improve the learning capabilities of organizations. After all, designing organizations to learn from experience and to exploit generated knowledge and experience is possible. But given the imperfections identified, the authors suggest a certain conservatism in expectations.

1.4 SEEKING THEORY

After the introductory considerations, and before a detailed account of inherent characteristics, organizational learning needs to be observed again from a meta-level standpoint. A discussion of different perspectives on organizational learning can serve as an initial indicator for the fact that there is a large degree of fragmentation in this field. Tsang (1997, p. 82) acknowledges this by saying that "an overarching framework which cohesively pulls together all the theoretical advances into a unified theory is lacking at the moment". Numerous authors share his view of an irritating absence of a cohesive theory and call for conjoint efforts from various academic disciplines towards developing one (e.g. Fiol & Lyles, 1985; Hedberg, 1981; Hodgson, 1995; Huber, 1991; Kluge & Schilling, 2000).

In contrast, Easterby-Smith (1997) argues that approaches to organizational learning are based on distinct, and largely incompatible, views of the nature of learning itself. He provides an account of six main disciplines, each with its own ontological assumptions, contributions, and problem sets (see *Table 1.2*): Psychology/organizational development, management science, organizational theory, strategy, production management and cultural anthropology. The disciplines' inherent ideas have infiltrated and influenced the territory of organizational learning and have spawned different perspectives. Easterby-Smith (1997) concludes that development might best be pursued within each of these areas, challenging attempts to create a single framework. Thus, organizational learning should be considered as a multidisciplinary field containing complementary contributions and research agendas.

Table 1.2: Disciplines of organizational learning

Discipline	Ontology	Contributions/Ideas	Problematics
Psychology and OD	Human development	Hierarchical organization; importance of context; cognition; underlying values; learning styles; dialogue	Defensive routines; individual to collective transfer
Management science	Information processing	Knowledge; memory; holism; error correction; informating; single and double loop	Nonrational behavior; short vs. long term; information overload; unlearning
Sociology and organizational theory	Social structures	Effects of power structure and hierarchy; conflict is normal; ideology and rhetoric; interests of actors	Conflict of interests; organizational politics
Strategy	Competitiveness	Organization-environment interface; levels of learning progressively more desirable; networks; importance of direct experience; population-level learning	Environmental alignment; competitive pressures; general vs. technical learning
Production management	Efficiency	Importance of productivity; learning curves; endogenous and exogenous sources of learning; links to production design	Limitations of unidimensional measurement; uncertainty about outcomes
Cultural anthropology	Meaning systems	Culture as cause and effect of organizational learning; beliefs; potential cultural superiority	Instability and relativity of culture as barrier to transfer of ideas; whose perspective dominates?

While it goes beyond the scope of these introductory pages to discuss all the points addressed in *Table 1.2*, many points addressed in the contributions and problematics columns will be covered in later sections. However, for now *Table 1.2* should demonstrate the degree of fragmentation and the diversity of issues of interest.

The research in organizational learning has also been accused of being non-cumulative in a sense that current studies seldom build on past research results (Tsang, 1997). In relation to this, Mackenzie (1994) even goes so far as to proclaim that after 30 years of research in the field, no discernible intellectual progress has been produced. However, Prange (1999) questions the feasibility of cumulative research in organizational learning. She argues that both, the non-cumulativeness and the differentiated contributions of organizational learning theories are related to their underlying meta-theories. The core distinction to be made is between a prescriptive, positivist approach that purports an objective generalizability of social science, and a descriptive, subjectivist approach that assumes reality to be socially constructed (Burell & Morgan, 1979). From an anti-positivist viewpoint, it is nothing unusual to have divergent perspectives, and non-cumulativeness might also be interpreted as an indicator of theoretical progres-

sion. Therefore, given the fundamental discrepancies between the two meta-theories, Prange (1999) concludes that the search for an integrated theoretical approach to organizational learning is neither adequate nor appropriate. However, a thorough discussion of the heterogeneity in the underlying meta-theories, positivism versus social constructivism, goes well beyond the scope of this text.

Given the absence of conclusive theory, Bertoin Antal, Dierkes, Child, & Nonaka (2001a) point to some promising developments, which they think might help alleviate the difficulties. They notice the emergence of a shared language between disciplines, a more global scope and increased cultural differentiation in research, the inclusion of interorganizational learning, and the recognition of manifold sources of knowledge and power needed for organizational learning.

All in all, the call for a coherent theory of organizational learning appears to resonate among the relevant research communities. Setting aside subjectivist criticism, a unified point of reference could advance the field in two ways.

First, it can provide a powerful tool for the development of empirical research. The notion of organizational learning is intuitively appealing to many real world settings, and intrinsically bears a connotation of the betterment of organizational life. Theoretical guidance in empirical work proves to offer not only a strong sense of direction and structure in attempts to establish causal inferences; it also facilitates the formation of sound conclusions and recommendations based on obtained data. As a result, the findings of scientific research in the field could be more readily cumulated and translated into further research questions and hypotheses.

Secondly, it could tie together the various disciplinary perspectives that all add aspects to the understanding of the focal phenomenon. As much as the notion of multiple disciplines raises awareness of the complexity and multifaceted nature of organizational learning, it tends to overly fragment the field, and thus researchers might easily lose sight of the fact that there are overlapping key elements of importance to any subject-specific viewpoint. The core idea of learning as a process that supplies the potential to change the internal and external environment, extrapolated to the dynamics of the collective, pertains to psychology, management science and cultural anthropology alike. Different disciplines subscribe to different paradigms of thought and convey different targets of insight (Kuhn, 1996). Yet in theorizing, these different targets are mainly

relevant to the *outcomes* of organizational learning, not to the inherent *processes*. As such, a procedural clarification of collective learning has the potential to preserve validity while spanning across disciplinary boundaries. From a procedural point of view, multiple disciplines are not an obstacle to unified theory.

A focus on processes will become clearer throughout the following pages and sections. By taking on a functionalist approach, a comprehensive procedural conceptualization of collective learning serves to contribute towards theory building. Defining theory as "a statement of *relationships between units* observed or approximated in the empirical world" (Bacharach, 1989, p. 498, italics not in original), a wide-ranging schematization of the specific forms and processes of learning at different stages constitutes a central building block for our purposes.

1.5 THE QUESTION OF LEARNING AT THE COLLECTIVE[3] LEVEL

While individual learning has been an established concept of debate since the early days of psychological research, the notion of organizational learning remains somewhat unclear and depicts not much more than a catchy phrase at first. Since the literature on the subject is generally somewhat imprecise about exact mechanisms, some fundamental questions arise. Does learning occur beyond the individual level? If so, is individual learning then a necessary precondition? In any case, is there sufficient evidence for a construct labeled organizational learning?

At the basic semantic level, Weick & Westley (1996) state that the use of the label 'organizational learning' constitutes an oxymoron, as organizing and learning are essentially antithetical processes. Learning means disorganizing and increasing variety, while organizing implies forgetting and reducing variety. The authors, however, manage to affirm this oxymoron by demonstrating that both processes are compatible as a balance between exploration and exploitation. In order for organizational learning to occur,

[3] The terms "collective" and "organizational" are initially used interchangeably here, both depicting learning beyond the individual level. This is done to map out important conceptual issues first, in order to then make a strong case for a more precise separation of levels of learning (see section 1.6 on levels of analysis).

learning as fostering diversity needs to be ensued by organizing as a means of consensus building (Fiol, 1994).

Prange (1999) addresses the questions raised above explicitly by saying "one of the greatest myths of organizational learning is probably [...] the way in which learning might be considered *organizational*" (p. 27, italics in original). She elaborates further that it remains unclear whether the academic discussion is about individual learning in organizations (Argyris & Schön, 1978; March & Olsen, 1979), organizational learning that is like individual learning (Hedberg, 1981), or some kind of aggregate or emergent learning (Cyert & March, 1963; Levitt & March, 1988). Jones (1995) even suggests that the entire concept might qualify as an anthropomorphic fallacy that leads to an inappropriate reification of the concept of organization. Popper & Lipshitz (1998) alleviate this extreme position by distinguishing between learning in organizations and learning by organizations. The former describes learning processes that occur in individuals' heads, albeit in organizational contexts, while the latter depicts learning processes that occur outside individuals' heads. The question remaining for a necessary reconciliation of the two concepts is how individual learning becomes organizational.

Given some strongly dissimilar opinions and even neglect of existence, a search of proof that learning does occur at the collective level appears imperative before any further exploration of internal mechanisms.

1.5.1 The learning curve

Deriving from their thought that organizations *cannot* ever 'not learn' (i.e., they always learn), Nicolini & Meznar (1995, pp. 738-740) argue that

> "...learning is a continuous process which is inherent in the very being of organizations. [...] This is not something organizations do as a choice, but something that enters the very definition of organizations as systems (Bateson, 1972; Varela, 1979). [...] Organizations actively engage in unending cognitive processes, and organizations, as collective forms of coordinated cognition and action, are continuously being transformed. [...] Organizations, through the action of those in charge, construe their identity by transforming change, past choices, past experiments, inventions, and so on into rational accountable knowledge."

In conclusion, the authors hold a firm belief that there is an *organizational* phenomenon occurring in collective learning. However, their argument remains on a theoretical level and is not substantiated by empirical data.

A source that provides more concrete evidence that learning does occur at a collective level is the research on organizational learning curves. This phenomenon has been found in many groups and organizations and dates back to an early investigation of the assembly of discrete units in the aircraft industry (Wright, 1936). The discovery is that, as groups and organizations produce more of a product, the cost of producing each additional unit and the errors made in production typically decrease at a decreasing rate. Thus the standard form of the learning curve resulting in a hyperbolic graph is

$$y = ax^{-b},$$

where y = the number of direct labor hours required to produce the x^{th} unit, a = the number of direct labor hours required to produce the first unit, x = the cumulative number of units produced, and b = the progress rate.

The effect was even shown to be stable enough to use it as a basis for planning and pricing strategies (The Boston Consulting Group, 1972). It has been recognized in the manufacture of a wide variety of products and has been extended to activities other than production tasks. Yelle (1979) originally differentiates between labor learning (i.e., learning by individual employees) and machine learning (i.e., efficiency gains in operations that are machine-paced) as underlying processes. However, learning effects appear to depreciate rapidly (Argote, Beckman, & Epple, 1990; Benkard, 1999).

The success of the learning curve approach to assess collective learning hinges mainly on the researchers' ability to control for other factors besides cumulative output that might affect productivity. It has been argued that important aspects of the improvements in manufacturing costs and the decrease in errors come through feedback from customers, but most of the research has emphasized the direct effect of cumulative experience on production skills[4] (Argote, 1999; Levitt & March, 1988). If cumulative experience accounts for the main effect on the observed outcomes, what does this experience contain, and who or what are its protagonists or vehicles? If knowledge acquired through learning by doing were entirely embodied in an organization's technology, then this particular organization would be independent of any specific members.

Epple, Argote & Devadas (1991) examine this hypothesis by analyzing the amount of transfer that occurs across shifts within a truck plant producing a single vehicle. In the case of a complete integration of knowledge in technology, transfer across

[4] Further, but somewhat less substantial and readily controllable, effects were ascribed to changes to the current scale of production, transformation of technology, or the passage of time.

shifts should be complete since both shifts use the same technology. These authors test this by analyzing data from a plant that began production with one shift and then added a second shift several months into the production program. The results indicate that substantial, but less than complete, transfer of knowledge occurred when the second shift was introduced. Thus it can be concluded that knowledge as the product of cumulative experience is not incorporated entirely in the realm of technology. Moreover, eliminating further explanations, Rapping (1965) demonstrates in a study on war ships that productivity gains associated with cumulative output were neither due to increased inputs of labor or capital, nor to increasing exploitation of economies of scale, nor to technical progress associated with the passage of time.

After ruling out a number of possible alternative explanations, key reasons for the learning curve effect remain to be discussed, namely improvements in individual performance and interaction among individuals themselves and with the environment. Following this notion, Argote (1993) extracts the prime facilitators of cumulative experience. She reasons that the cumulative number of units produced is a proxy variable for knowledge acquired through production. If unit costs change as a function of this knowledge then it can be inferred that learning has occurred. She classifies three factors affecting learning (pp. 36-37):

- improvements in the performance of individual employees;
- improvements in the system (i.e., organization and coordination of work and the organization's technology); and
- improvements in the performance of actors in the organization's environment (i.e. suppliers or other firms in the industry).

Thus there might be individual, system, and environmental components to organizational learning curves. Since these three components are difficult to isolate experimentally, that is in a single experiment, Argote (1993) reviews the literature on each one separately in order to then compare the three components against one another and assesses their relative influence.

With regard to the environmental component, operationalized as the transfer of knowledge from external groups or organizations, an undoubted role in productivity gains is recognized, but this might contribute more to the starting value of the learning curve than to the characteristic decrease in unit costs or errors associated with experi-

ence (Argote et al., 1990). Organizations seem to only be susceptible to knowledge acquired by other organizations at certain periods, such as early in their development. Some components of knowledge are likely to be tacit and not easily transferable. Moreover, much of the knowledge produced is idiosyncratic to particular settings, thus obstructing inter-organizational exchange. In addition, using cumulative output aggregated across all firms in the industry as a proxy for environmental knowledge, Argote et al. (1990)[5] showed that little transfer occurs from one organization to another once production had begun. Hence, organizational learning curves do not seem to be grounded entirely in knowledge acquired from the environment.

Regarding the individual component, the question is raised whether organizational learning curves are simply aggregations of learning curves of individual members? Some field studies suggest that group experience may be a more important predictor of group performance than individual experience (e.g. Katz, 1982). The training literature also gives a strong indication that group training leads to better results than separated individual training, especially for tasks involving coordination (Goldstein, 1991). The role of individual learning is appraised mainly by the study of employee turnover. If learning were embedded primarily in individual employees, then turnover should have a negative effect on group or organizational learning. The results are somewhat inconsistent, as there are a number of confounding variables such as the nature of the task, employee quality, and organizational structure. Argote (1993, p. 41) acknowledges this by concluding that individual experience becomes less important than system experience as a predictor of organizational learning as coordination requirements within the organization increase, the organization becomes more structured, and the individual becomes less skilled. Individual learning is an integral part of the organizational learning curve, but the accumulated learning of all individuals concerned does not seem to add up to explain the whole effect.

Taken separately the individual and environmental components cannot fully account for the entire observed decrease in production costs and error frequency. Whether they can do so if combined remains unanswered by Argote (1993). However, consider-

[5] Argote et al. (1990) use the same data set as Rapping (1965) on the meticulously documented construction of Liberty Ships during World War II. These ships, 2078 in total, were made at 16 newly constructed and purpose-built shipyards by a majority of previously inexperienced workers from homogenous raw materials. The features create the unique situation of a tremendously high standardization for a host of important factors, such as prior experience of workers, environmental setting, product characteristics, input characteristics etc.

ing that all experience and knowledge must be related to some memory function in order to make the learning curve effect possible (otherwise there could not be any *cumulative* experience) renders the argument for a system component more compelling. Institutionalized knowledge is stored for example in standard operating procedures or formalized knowledge management systems, and allows for a content accumulation that is separate from the individual and environmental component. On this note, Argote concludes that there is truly a system component to organizational learning curves. What exactly constitutes and characterizes the system component and where the system knowledge might be contained is considered in a rather brief ensuing discussion that leaves the answers to these questions ultimately unclear. However, Argote's (1993; see also Argote, 1999) subtractive approach to identifying a collective or organizational form of learning does provide some evidence for its existence.

The analysis of the learning curve findings reveals some conceptual features and shortcomings that need to be addressed. In order to outline the present study's perspective and avoid an erroneous methodology, the treatment of learning as an outcome and the measurement of learning as a change in performance will be discussed. The two are somewhat intertwined, since the treatment of learning as an outcome augments the tendency to equate learning with performance. However, a case is made here against the two assumptions.

1.5.2 Treating learning as a process

Organizational learning is conceptualized in the literature in two different ways; some treat it as an outcome, others as a process (Edmondson, 1999).

Going back to the initial account of perspectives on learning, ideas such as learning as adaptation or learning as intelligence represent an outcome-focused view. The management literature is, naturally, interested in what comes out of learning, what is the bottom line. Here, learning is construed in rough and basic terms and is causally related to issues of interest, such as improved competitiveness, productivity, or innovativeness. This reflects the behavioralist paradigm that dominated (and still influences) psychological thinking for decades, especially in North America. Learning is explained in terms of input and output, stimulus and reinforcement. Much the same as the rat in the Skinner Box is being reinforced with food pellets for pressing buttons, the organization

is reinforced, for example, for a restructuring program by subsequent increases in productivity. Both the rat and the organization apparently learn, but just exactly how this happens internally remains uncertain. In the case of the rat, we would assume that the learning has something to do with the animal's brain, which is admittedly complex enough in itself. In the case of the organization, however, the question of locating learning internally becomes more complicated and more dispersed. Thus, the outcome view perpetuates the image of learning as something that goes on in a black box, and little effort is undertaken to see what is inside.

In contrast, a process view of learning facilitates an understanding of behaviors or mechanisms that lead to outcomes. Put in crude behavioralist terms, a procedural perception of learning allows for the examination of the throughput between the input and the output. According to Edmondson (1999) the conceptualization of learning as a process can be traced back to the work of the educational philosopher John Dewey, who described learning as an iterative process of designing, carrying out, reflecting upon, and modifying actions (Dewey, 1922). Stressing the notion of learning as a continuous process grounded in experience, Kolb (1984) elaborates the procedural character of learning. In the special case of organizational learning, lack of knowledge about processes increases the difficulty of reaching sound empirical conclusions about the causality of outcomes, since many influences in field settings cannot be controlled. A predominantly outcome-focused view therefore limits the scope and validity of findings. In addition, treating learning as an outcome entices researchers to equate learning with performance, a problem that will be discussed in the next section.

Inherent in a process perspective is also a certain separation from the types of learning concept. While implying some largely undescribed procedural character, the ideas of single- and double-loop learning mainly refer to the outcomes of learning, which are described as the fine-tuning of an organization's theory-in-use or the alteration of its underlying assumptions (see section 1.3.2). Hence, the discussion of the processes of organizational learning will be mostly kept separate from the generic types of learning concept.

Yeo (2002) elaborates on the distinction between process and outcome by recognizing a behavioral and a cognitive approach in the organizational learning literature. The former declares that learning is directly linked to some action that follows from it, while the latter explains learning as a complex process involving skills like mental mapping, use of intuition and imagination, and problem solving. Cognitive learning is

generative in that it is regarded as creating rather than coping, it imbues a systems perspective where the whole is larger than the sum of its parts, rather than perceiving actors as monolithic entities that produce outcomes. The behavioral approach draws little or no conclusions about the thinking process involved, while the cognitive approach gives details of how learners make sense of issues and situations, develop insight and understanding, and see patterns in their environment (Yeo, 2002, p. 114). *Table 1.3*, modified from Yeo (2002, p. 117), summarizes these arguments.

Table 1.3: The behavioral and cognitive approach to organizational learning

Theoretical perspectives on learning	Behavioral approach	Cognitive approach
Operationalization of learning	Learning as manifesting action and behavioral change, linked to a stimulus and a response	Learning as a complex process involving skills like mental mapping, use of intuition and imagination, and problem solving
Level of analysis	Macro studies which look at organizations as a whole, particularly the strategic outcomes Draws no conclusions about thinking process involved or emotional responses of learners	Detailed studies of micro practices within organizational or trans-organizational settings Explicates how learners make sense of issues and situations, develop insight and understanding, and see patterns in their environment

In conclusion, I follow my arguments in treating learning as a process in my further theorizing and attempt to articulate the variables and relationships that this process consists of. In addition, throughout the remainder of this text, learning is understood as a primarily cognitive phenomenon, while it is recognized that cognition and action are tightly intertwined (Crossan, Lane, & White, 1999). A generally procedural perspective does not, however, obstruct the view on learning as leading to knowledge stored in memory. Moreover, adopting these positions should not give rise to neglect for a suspected reciprocal influence between process, outcome, and context. Yet, the question remains whether there are generic core processes that can be validated across different settings and targets.

1.5.3 Learning and performance

Organizational learning is usually associated with improvement in performance. Some authors even claim that performance must be enhanced in order to be sure that

organizational learning has taken place (Argyris & Schön, 1978, p. 323; Fiol & Lyles, 1985, p. 803). An implicit assumption utilized in the research on learning curves is that learning somehow equals performance; to be more exact, that learning can be measured by measuring performance. Since learning, or knowledge for that matter, is a difficult concept to measure, the cumulative number of units produced or the reduction in errors is taken as a proxy variable for learning.

In contrast, many recent works have stated clearly that learning does not always improve performance. As a starting point, it can only do so when the knowledge obtained is accurate and veridical (Huber, 1991; Tsang, 1997), since organizations can also learn things that are incorrect (Miner & Mezias, 1996). Taking into account a necessary prior implementation of new knowledge for performance increases to occur, this is further complicated. Moreover, improvements in performance can also happen due to chance or changes in the environment, leading to possibly erroneous causal inferences. As a result, linking a definition of organizational learning to an imperative improvement in performance, adaptive ability, or target orientation appears to be problematic.

Another notion on learning suggests that learning need not be conscious or intentional (Huber, 1991). Although the widespread use of research and development departments as forms of deliberate and institutionalized learning seems to contradict this, concepts such as congenital learning, vicarious learning, or scanning of the environment leave ample room for knowledge acquisition by pure chance.

Fundamental definitions of learning at the individual level describe the concept as a relatively permanent change in *potential* behavior (Anderson, 1995; Houston, 1991). Prior learning need not necessarily be expressed in overt, measurable behavior. Thus any exclusive concentration on outcome variables will fail to capture the very part of learning that is not translated into observable action. Maier et al. (2001, p. 17) illustrate this by saying that it is "helpful to define organizational learning irrespective of changes in performance", thereby advocating that successful learning and improved performance be considered separately. Given their statement, it seems sensible to assume that at the organizational level, too, there is discordance between prior learning and subsequent performance, and several authors explicitly subscribe to the irrationality of this link (Bood, 1998; Crossan, Lane, White, & Djurfeldt, 1995; Duncan & Weiss, 1979; Fiol & Lyles, 1985; Huber, 1991; Lipshitz, Popper, & Friedman, 2002).

Learning curve researchers acknowledge this in part by theoretically limiting themselves to empirical examinations of behavioral change in the light of organizational

acquisition of experience (Argote, 1999, p. 16). Holding all other factors constant, the occurrence of learning is inferred on the basis of an observed increase in performance (i.e. cumulative output). But since we have established that learning can have occurred irrespective of changes in performance, the learning curve effect will reflect only a fraction of the learning total. Following this rationale, two organizations that show differences in their cumulative output coefficients cannot be said to have learned 'less' or 'more', since the difference might simply lie in their rate of translating learning into behavior. As a result, it seems safe to relate the learning curve effect to some prior learning, but not to all prior learning.

On the basis of the above discussion, it seems obvious that any attempt to measure, and especially to quantify, learning by measuring performance is likely to not capture the whole story. In an organizational setting, the expression of learning in subsequent behavior is thought to be dependent on such factors as motivation (Maier et al., 2001), culture (Plaskoff, 2003), power relations (Vince, 2001), trust and safety (Edmondson & Moingeon, 1999), or task related features (Dierkes, Marz, & Teele, 2001). If these factors act as obstacles, learning content will fail to reach the organizational stage, because individuals that have learned choose not to translate their new knowledge into observable behavior. In addition, the availability of experienced individuals, that is individuals that have learned, must be ensured, a condition that would be precluded by layoffs or voluntary turnover (see for example Argote & Epple, 1990; Carley, 1992; Starke, Dyck, & Mauws, 2003). In all such cases learning, and knowledge, is *lost* to the organization.

This assumption yields important connotations. First, stating that learning can be lost to an organization implies that it must have been acquired or enacted first. There seems to be a sequence of events, a set of different agencies involved. It must be suspected that there are different stages across which learning and knowledge progress. Second, the necessity for learning to be expressed in behavior in order to affect performance allows us to assume that the notion of sharing is crucial to organizational settings.

1.6 LEVELS OF ANALYSIS

Based on the review that the existence of a collective form of learning is presumably undisputed, its internal *processes* strongly lack widespread agreement and clarification. I have raised the question of different agencies involved, broadly speaking, who does the learning? As a starting point, Fiol & Lyles (1985) spot an implicit confirmation in the literature that organizational learning is distinct from individual learning. Huysman (1999) carries Fiol & Lyles' distinction further and identifies an individual action bias in various theoretical approaches, increasing the possibility to neglect the role played by structural conditions. Such structural conditions are integrated to a certain extend into Levitt & March's (1988) concept of routines. They see organizations learn by encoding inferences from history into routines that guide behavior. These routines are believed to be independent of the individual actors who experience them and are capable of surviving considerable turnover in individual actors (p. 320). Thus, they perceive a certain 'emergent' component in organizational learning, but fail to explicitly describe it.

Argyris & Schön (1978) consider organizational learning more as a metaphor since organizations to them do not literally remember, think or learn; thus they are thinking more of individual learning in organizations. Their theory of learning defines levels of individual learning in relation to individuals' 'theories of action' and extends this to collective entities. Given numerous conceptualizations of organizations by prominent scholars as meaning systems, interpretation systems, thought systems, or simply systems of great complexity, the feasibility of such an extension can be called into question.

In this light, Duncan & Weiss (1979) conclude that the concept of organizational learning offered by Argyris & Schön (and another concept introduced by March & Olsen, 1975, that will be discussed in a later section) is limited to the individual's knowledge. They criticize those authors for "having done little more than extract basic concepts of learning theory, problem solving, and theory construction at the individual level and placed these into an organizational context." (p.88)

Various authors provide definitions of organizational learning as something "more than collective individual learning" (Daft & Weick, 1984; Duncan & Weiss, 1979; Fiol & Lyles, 1985; Levitt & March, 1988; Senge, 1990a) and something more complex and

dynamic than a mere magnification of individual learning. Hedberg (1981, p. 6), for example, states:

> "Organizations as such do not learn; members of organizations learn."; [but] "Although organizational learning occurs through individuals, it would be a mistake to conclude that organizational learning is nothing but the cumulative result of their members' learning. Organizations do not have brains but they have cognitive systems and memories [...] Members come and go and leadership changes, but organizations' memories preserve certain behaviors, mental maps, norms and values over time."

In another account of the same ilk Dixon (1994, p. 36) claims:

> "...each organizational member can learn. An organization learns through this capability of its members. Organizational learning is not simply the sum of all that its organizational members know – rather it is the collective use of this capability of learning."

There seems to be a convergence on the logic that organizational learning can only take place through the learning of individuals or that individuals are the *principal agents* of organizational learning (Argyris & Schön, 1978; Fiol & Lyles, 1985; Hedberg, 1981; Huber, 1991). According to Dodgson (1993, pp.377-378),

> "... individuals are the primary learning entity in firms, and it is individuals which create organizational forms that enable learning in ways which facilitate organizational transformation."

Yet, organizations quite frequently know less than their members, as, for example, can be illustrated in the case of universities. If the individual plays a pivotal role in the process of organizational learning, and that very process lacks exact description, then the link between the individual and the organization occupies a critical position in any theory of organizational learning. The discussion in the literature often implicitly addresses either individual or organizational learning, or a hybrid of both, but does not explicitly address how individual learning actually translates into organizational learning.

Organizations consist of individuals, and individuals operate together in order to achieve tasks that cannot be done by single members alone. In general, organizations are social structures formed by individuals and groups. Individuals work in dyads, groups, and teams within organizations. Naturally, organizations are multilevel (Klein, Dansereau, & Hall, 1994). Hence, the answer to the basic question 'Who does the learning?' must be to differentiate between *three levels of analysis*, the *individual*, the *group*, and the *organization*. To examine organizational learning is thus to recognize levels issues.

Organizational research has traditionally suffered from a bifurcation concerning levels of analysis (House, Rousseau, & Thomas-Hunt, 1995). As the quotations above indicate, the orientation focuses mostly either on a micro or a macro level, that is, either on the individual or on the organization, without integrating the two. Such exclusive theorizing, however, is quickly rendered inadequate when individual behavior is placed in a larger context, or when organizational functioning is predicted irrespective of human agency. Some of the most prevalent psychological theories, such as goal setting theory, do not account for the influence of organizational contextual variables, while organization studies frequently omit inherent human processes. What is needed then is an integrated approach, since no construct is level free. Organizations affect behavior and behavior affects organizations, which elucidates the existence of multiple, reciprocal causalities. In sum, constructs not only apparently span across different levels of analysis, but it must be concluded that there are distinct procedural associations between levels. House et al. (1995) state that "the distinguishing feature of organizational phenomena is that processes at several levels of analysis are in some way linked" (p. 73). For our purposes, this directly relates to the underspecification of the mentioned crucial link between the individual and the organization in collective learning. Conceptual clarity can only be attained through specification of integral processes at different levels of analysis, and recognition of procedural linkages. The essential entity connecting the micro and macro levels, the link between individuals and the organization, is the group (Pawlowsky, 2001). This tripartite perspective will be elaborated below.

1.7 LEARNING AT DIFFERENT LEVELS

Realizing the multi-level nature of organizing leads to a set of interesting conceptual questions about implications for organizational learning as well as a requirement to specify the usage of descriptive terms. The argument is that all three levels of analysis need to be considered in a definition and analysis of organizational learning. Since cognitive learning of individuals as principal agents seems crucial, one question would be whether groups or organizations can learn without individual learning involved. In the context of organizational learning, the reverse question whether individuals could learn without affecting groups or organizations is also imaginable. Jost & Bauer (2003) elabo-

rate on these issues by introducing a formalism that responds to the question: Who does the learning?

If we follow Argyris & Schön's (1978) denial of genuine collective learning, defining organizational learning (OL) would lead to some notion of distribution or threshold of individual learning.

(F1) OL = learning staff / number of staff

Here, the organization learns when most individuals learn something. This leaves the problem of defining the meaning of 'most' as a threshold, where it is unclear at what percentage ratio a case of organizational learning can be postulated.

Taking the notion of an emergent component into consideration, which suggests that organizational learning is more than the sum of individual learning results in the summative formula below.

(F2) OL = ILL + GLL + OLL

ILL = individual level learning
GLL = group level learning
OLL = organizational level learning

The simple summative formula (F2) assumes that learning on different levels can be substituted by one another, and an equal degree of organizational learning is achieved. This would allow for various combinatorial equivalences, for example no learning on the individual level, but group learning and organizational learning. By simply combining the binary condition of 'learning/no learning' on three levels this would suggest eight different types of organizational learning. For example:

1) ILL no / GLL yes / OLL yes
2) ILL yes / GLL no / OLL no
3) ILL no / GLL no / OLL yes
4) etc.

Some of these combinations appear highly unlikely and it remains to be clarified to what kind of organizational fact these logical learning situations would correspond. However, since the individual has been identified as the crucial building block, some

adjustment to accommodate an individualist bias as a requirement for a collective component seems indispensable.

$$(F3) \quad OL = ILL\ (GLL + OLL)$$

In formula 3 learning at the individual level is enhanced by contributions from the group and the organizational level in order to constitute organizational learning. However, it is confirmed that individual learning must be present, because if a factor equals zero, the total will equal zero. In addition, trans-individual learning must be present in order to detect organizational learning. It should be noted that factoring out in the case of formula 3 is not allowed for logical purposes. The combinatorial logic is now reduced to a more manageable three:

1) if OLL = 0, then OL = ILL x GLL
2) if GLL = 0, then OL = ILL x OLL
3) if none = 0, then OL = ILL (GLL + OLL)

The formalism developed by Jost & Bauer (2003) remains on a somewhat theoretical note and should not be scrutinized for its mathematical implications, but nonetheless clearly illustrates a serious deliberation of the multi-level nature of organizational learning. Above and beyond its thought-provoking impulse, the outlined formalism also facilitates a more precise debate, since most authors use 'organizational learning' as some type of umbrella term, thereby obfuscating organizational level learning (OLL), or completely passing over the question of different agencies involved. Any further theorizing in this thesis is based on the concept of organizational learning that is represented in formula F3, where ideally all three levels of analysis are involved in the learning efforts.

Scholars of organizational learning have overwhelmingly failed to make explicit level distinctions. One of the few exceptions are Cangelosi & Dill, who as early as 1965 discern three levels of analysis (Cangelosi & Dill, 1965). This distinction has, however, not found its way into many subsequent works that either overemphasize one level, or completely abandon any real differentiation by imposing features of the individual on the organization. Based on such shortcomings and the argumentation delineated so far,

it is felt that the recognition of three levels of analysis[6] – the individual, the group, and the organization – is an indispensable milestone towards procedural clarification, and ultimately towards theory building in the field of organizational learning.

So how does learning then proceed at different levels of analysis? The following three subchapters provide an overview of important characteristics and distinguishing features. As our focus remains on processes, a comprehensive account of theoretical backgrounds and empirical paradigms, especially in the case of individual learning, cannot be given here. Instead of attempting to review the learning literature, the interest is specific to the question how information is processed at different levels of analysis. In addition, a further set of subchapters is then devoted to a discussion of memory concepts at different levels of analysis, since no learning can take place without a joint memory function. The intention behind this elaboration is to map concepts against one another in order to identify procedural linkages in an organizational context.

1.7.1 Learning at the individual level

Identifying the individual level first accords with the concept of individuals as principal agents of learning as elaborated above. When tempted to reify and anthropomorphize organizations, it is important to realize that collections of single individuals are the building blocks, the essential elements, of larger entities. Organizations do not have brains, and it seems not only intuitively convincing that ultimately "all learning takes place inside human heads" (Simon, 1991, p. 125). Hence, knowledge of individual learning is crucial for understanding learning at higher levels of aggregation.

Individual learning is probably the most constitutive component of psychological research, ever since the official inception of the discipline by Wilhelm Wundt in 1879. But although learning has intrigued scientists for far more than a century now, little consensus has been made and large areas still suffer from a lack of fundamental insight. Research on learning can roughly be classified into three broad theoretical approaches, which more or less appeared in chronological order. The first approach stems from a

[6] Some authors also suggest an inter-organizational fourth level to capture learning at the population level (Crossan et al., 1995; Miner & Mezias, 1996; Pawlowsky, 2001). Since research on the population level has to take into account environmental parameters such as market characteristics, governmental regulations, or industry- and technology-specific factors, the analysis is limited here to the organizational level as the upper maximum of aggregation. It is acknowledged that organizations do not operate in a vacuum and respond to external influences, but the main focus here is on processes internal to the organization.

conceptualization of the learning process as an action sequence leading from a stimulus to a response. This somewhat mechanistic idea is concerned with objective and observable components of human behavior, and is thus labeled behaviorism. Influential proponents like Watson, Guthrie, Thorndike, and Skinner defined as the goal of behaviorism the development of laws that explain the relationships between antecedent conditions, reactions, and consequences of behavior. Methodologically, this is attained, for example, in the paradigms of classical and operant conditioning. The main criticism of behaviorism, that it is overly simplistic and that it doesn't account for the influence of such factors as human consciousness, emotion, or variegated interaction with the environment, provided the building block for the second approach, neo-behaviorism. Neo-behaviorists are still interested in stimulus and response, but they are also concerned with what happens within that sequence. Scholars in this realm like Hull, Spence, Hebb, and Osgood, extended behavioralist thoughts by acknowledging that neurological mechanisms exist that are responsible for information processing, and by exploring the associated neurological units and their influences on behavior. So the traditional sequence of stimulus-response was expanded to stimulus-(mediating) processes-response. Critics, however, still assume that the neo-behaviorist position is too mechanistic and reduces the complexity of human information and decision processing to a crude mediation between static behavioral components. This second approach does open the 'black box' of the human mind to a small extend, but remains within tight paradigmatic boundaries for reasons of apparent precision and objectivity. In contrast, the third and most recent approach, cognitivism, grants no significance whatsoever to stimulus and response. Instead, the main focus is on so-called higher mental processes, such as perception, problem solving through insight, decision and information processing, and understanding. Human beings are no longer treated as black boxes and consciousness plays a central role in an attempt to explicate complex mental events and 'look inside the head'. Encouraged by new experimental techniques and analytical tools, researchers like Bruner, Ausubel, and Piaget place emphasis on thought and thinking. Although the methodology for investigation into the first two approaches might be more precise (after all, overt behavior is measured instead of elusive concepts such as thoughts), there seems to be some agreement that the cognitive approach more aptly captures the essence of most human learning.

However, it has been acknowledged that learning cannot be reduced to a simple acquisition of bits of information or the effective handling of environmental influences.

How human beings obtain behavioral patterns that enable them to act appropriately in social settings is the main concern of the social learning approach, which attempts to integrate various streams of learning theory. Interestingly, this approach mostly applies conventional learning theories to social situations, and the utilized theories are rather behavioralist than cognitive. Advocates like Bandura explain social learning essentially as a form of imitation coupled with operant conditioning. While the social learning idea reveals shortcomings to the claims of universal validity of especially the first two mentioned learning approaches, its integrative capacity is limited as it basically offers the social application of a traditional paradigm.

For the context of work-related learning, and learning in organizations, that the present text is concerned with, there are two points that deserve emphasis in order to arrive at a working concept of individual level learning. First, the understanding of, and interest in, learning as a process points to a vital need to conceptualize what goes on inside the black box. The central notion of information processing implies an unmistakable proximity to the cognitive paradigm. Second, if the perspective is procedural, and embedded in an action-related context, learning is necessarily grounded in experience. Learning does not occur in a vacuum, nor does it usually involve clinical laboratory settings. Research methodologies that acknowledge the existence of consciousness and thought, but limit inquiry to the acquisition, manipulation, and recall of abstract symbols fail to capture the crucial role of individual knowledge that is constantly tested out in the experience of the learner.

Kolb (1984) makes a strong case for learning as a continuous process grounded in experience. His concept of experiential learning is somewhat based on cognitive theory, but tries to create an integrative perspective on learning that combines experience, perception, cognition, and behavior. Drawing on the ideas of Kurt Lewin, John Dewey, and Jean Piaget, he describes learning as involving a transaction between the learner and the environment, and stresses the integral process of knowledge creation. As learning is a continuous process, all learning is relearning, in which prior knowledge and skill shape subsequent understanding and action. Concrete experience then produces reflexive effects that change the knowledge and skill base. Representative of the experiential learning concept is the four-stage model shown in *Figure 1.2* below (Kolb, 1984, p. 21). Immediate experience serves as a source for observations and reflections that are assimilated into abstract concepts and generalizations, whose implications are tested in

new situations, thereby creating new experiences. Defining learning as a result of experience also distinguishes the concept from maturation processes and from performance limitations due to situational constraints, which might cause behavioral changes as well (Maier et al., 2001).

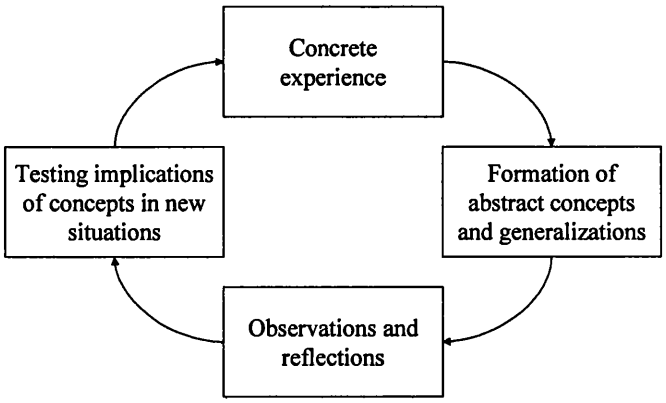


Figure 1.2: The Lewinian experiential learning model

Kolb (1984) adopts the cognitive approach, especially given the two phases of reflection and abstraction. But he explicitly adds an action component by linking cognitive learning immediately to direct experience. Thus, experiential learning is not a new approach, but evolves the crude and often quixotic cognitive paradigm into a more tangible form. Advantages of this are a coherent and clarifying illustration of the learning process, from which clear implications for practical settings can be derived. Kolb's (1984, p. 38) own definition of individual learning is as follows.

> "*Learning is the process whereby knowledge is created through the transformation of experience.* This definition emphasizes several critical aspects of the learning process as viewed from the experiential perspective. First is the emphasis on the process of adaptation and learning as opposed to content or outcomes. Second is that knowledge is a transformation process, being continuously created and recreated, not an independent entity to be acquired and transmitted." (italics in original)

This working definition accounts for the delineated procedural aims and provides a sound basis for further theorizing at higher levels of aggregation. The depicted cycle of learning somewhat resembles the scientific method of testing hypotheses as the most developed form of problem solving. It has appeared in its basic form in many different settings using different labels (Kim, 1993a). However, it fails to explicitly address the role of memory, which must be assumed to be crucial in any learning. So when we as-

sert that all learning is relearning, what is not meant is starting from scratch, but remodeling on the basis of prior experience stored in memory. Although learning and memory are tightly interconnected, the memory component is under-specified in the process model above, and therefore will be discussed separately later.

1.7.2 Learning at the group level

Individuals form groups in order to achieve tasks that cannot be done alone, or that require transindividual coordination.

Identifying and discussing learning at the group level necessitates a brief inspection of the structural meaning of the concept of group, and to make a distinction regarding learning between formal and informal groups. Formal groups are described as canonical, bounded entities situated within organizations. They incorporate recognized role descriptions, membership status, goal-orientation, and leadership (Guzzo & Shea, 1992). Analysis of group level learning for these cases is compatible with the official organizational structure. In contrast, learning at this level can equally occur through informal groups. These are often noncanonical, rather fluid than bounded, and possibly stretching across organizational units. Role descriptions, membership status, or leadership often remain uncertain or subliminally acknowledged. A conceptualization of informal groups that is especially helpful in the context of group learning is that of *communities-of-practice*, which has been proposed by Brown & Duguid (1991). These authors recognize manifold divergence between espoused practice and actual practice. In many settings, groups emerge in the process of activity, instead of being created in advance in order to carry out a task. Thus, learning should be understood in terms of communities that emerge, enact learning, socially construct meaning, and that are highly interpretive (DeFillippi & Ornstein, 2003; Wenger, 1998). In sum, for the present purposes both conceptualizations of groups can serve as a unit of analysis. A point is made here, however, not to limit the analysis of group learning to formally recognized entities.

Groups consist of individuals, and hence individual learning must be the necessary building block for group learning (as it is for organizational learning). However, it has been said that the unique nature of the organization constitutes something more than the sum of its individual members. The same might be said for groups, since cognitive

processes at the group level can no longer reside exclusively in separate individuals, but are assumed to be present also in the interrelations between the activities of group members (Gibson, 2001). Again, the perspective of interest is a procedural one, focusing on cognition and activities through which individuals develop and generate knowledge through experience with one another. As in the individual case, group learning can be directly related to action, and Edmondson (2002) conceptualizes it as an iterative action-reflection process. Gibson (2001) even proposes a four-stage cyclical model that is strikingly similar to the one put forward by Kolb (1984). But what exactly then constitutes the difference between learning at the individual and at the group level? Indeed, individual learning appears to be an integral part, but given the unique characteristics of a group[7], the essence of group learning seems to lie in the interaction among its members, in *communication.*

At the group level, social interaction enables group members to generate knowledge and insight that no individual had to begin with (Argote, Gruenfeld, & Naquin, 2001; Edmondson, 2002). An entire literature on socially shared cognition and knowledge creation has recognized that, much like the pieces of a puzzle put together, collaborative thought and action can lead to emergent knowledge (e.g., Cannon-Bowers & Salas, 2001; Gioia & Sims, 1986; Nonaka, Toyama, & Byosiere, 2001). The notion of sharing encapsulates the essence of the emergent gain that is alluded to when stating that group learning is more than the sum of its parts. In a generally cognitive approach, information, knowledge and contents of memory must be "shared, evaluated, and integrated with that done by others" (Duncan & Weiss, 1979, p. 89). Interaction and dialogue among group members are crucial towards developing and enabling shared understanding and conceptual schemes (Jelinek & Litterer, 1994). In this view, learning is regarded as creating rather than coping, and is popularly labeled generative (Senge, 1990a). Some authors heavily emphasize the social context aspect of group learning and assert that virtually all knowledge generation must be understood on the basis of its social foundations. In this view even individual experiences occurring in a private context can be construed as learning from others (Brown & Duguid, 2000). This perspective is challenged, however, by a more moderate standpoint highlighting individual agency in group interaction. Here, as cognition is ultimately an individual process, a feedback

[7] Gibson (2001, p. 122) defines a group as "a social aggregation, recognized as a meaningful unit by its members, in which a limited number of people interact on a regular basis to accomplish a set of shared objectives for which they have mutual accountability. "

loop from group processes back to individual cognition is pointed at (Maier et al., 2001). In summary, the notion of sharing in groups can be illustrated using an analogy to a watercolor painting. As each new color is added, it merges with the others to produce the final effect, in which the contributing parts become invisible.

But communication need not solely proceed through verbalization, as intuitively salient. Communication can also manifest itself in observed and shared *action.*

This is vividly illustrated in a study by Weick & Roberts (1993), who do not specifically use the label 'learning', nor do they explicitly limit their analysis to the group level. But they generate new ideas by systematically observing high-reliability systems and thus make a strong point about communication through action, its procedural character, and the patterns of interrelations. Their object of interest is the social interaction on aircraft carriers, systems that require nearly error-free operations. In undertaking research in such an environment, their rationale is presented as follows:

> "...organizations concerned with reliability enact aggregate mental processes that are more fully developed than those found in organizations concerned with efficiency. By fully developed mental processes, we mean that organizations preoccupied with reliability may spend more time and effort organizing for controlled information processing, mindful attention and heedful action. [...] Reliable systems are smart systems." (p. 357)

Weick & Roberts (1993) explore collective mental processes presumed to be inherent in all groups and organizations, but more easily detectable and likely to be higher developed in extreme environments. A starting point to decipher the subliminal dynamics is the idea of group mind, a form of cognitive interdependence focused around memory processes. For the concept of group mind this interdependence exists independent of any aspect of homogeneity in a particular group. It also seems that connections between behaviors, rather than people, may be the crucial 'locus' for mind and that intelligence is to be found in patterns of behavior rather than in individual knowledge (pp. 359-360). Moreover, in terms of action coordination in teams, the concept of group mind suggests that individuals should have overlapping rather than mutually exclusive task knowledge, allowing for the development of behavioral dependencies that shape the behavior pattern of the group. So mind is actually seen as activity rather than entity, with collective mind differing from individual mind (see also Eisenberg's, 1990, examination of musical jamming experiences as a form of collective mind through shared action). As a central part of their argument, Weick & Roberts (1993) then introduce mind as a disposition to heed. Heed positions qualities of carefulness, attentiveness, and vigi-

lance along the target object of failure-free performance, and thus heedless performance suggests a failure of intelligence rather than a failure of knowledge. A dissection of interrelated activities of groups, integrated into the theory of group performance by Asch (1952), leads to the concluding notion of heedful interrelating as collective mind. There is a transindividual quality of collective mind as contributions of any one individual actualize collective mind to the degree that heedful representation and heedful subordination define those contributions. Variations in heed as the prime requirement for efficacious collective mind can emerge through the influx of newcomers into the system. In such cases, the interaction among those who differ in their experience with the system, for example through the exchange of vivid stories of heedful interrelating, is important for the survival of heedful images. Weick & Roberts (1993) then apply their ideas of heedful interrelating to examples of complex systems in the laboratory and on aircraft carriers, illustrating one specific case of expensive failure in great detail. The latter exemplifies a limit to heedfulness, an overload of complexity and subsequent incomprehensibility described in military jargon as OBE (overcome by events), which elucidates, however, that heedful interrelating of activities is better able to comprehend complex events than is true for smart but isolated individuals. Thus, a lasting conclusion is the presumption that high-reliability organizations have more developed minds than high-efficiency organizations. In high-reliability systems, interpersonal skills are a necessity because, as people incline towards individualism and fewer interconnections, organization mind is simplified and soon becomes indistinguishable from individual mind. In contrast to Perrow's (1984) well-known research on catastrophic accidents, the authors suggest in their analysis that one of the reasons for the relatively few accidents on aircraft carriers is actually the tightly coupled nature of the system. Heedful interrelation builds a mutually shared field that is tightly coupled socially and thus meets the demands of a system that is tightly coupled technically.

Although the concepts of collective mind and heed might be perceived as somewhat inchoate and procedurally unclear for our purposes, the aircraft carrier study provides evidence for the role of shared action in group learning. Thus group communication as the core of group learning can work in two ways, through verbalization and through action.

In their outline of a theory of group action, von Cranach et al. (1986) establish communication as the form of information processing on the group level. This is labeled secondary information processing, which is based on primary information processing,

namely individual cognition. Cognition is still exclusively an individual process, but it forms the foundation for group information processing, that is, communication. Extending von Cranach et al.'s argument by drawing on Weick & Roberts, verbalization and action as the two channels of communication can be consolidated.

It is clear that delineating group learning without any attention to memory processes is incomplete, as learning and memory at this level of analysis, too, are tightly intertwined. Since memory processes on the group level are part of group communication (Bangerter, von Cranach, & Arn, 1997), the issue becomes doubly apparent. Again, the memory question deserves separate attention and will be dealt with in a later section.

1.7.3 Learning at the organizational level

Learning at the organizational level necessarily includes both individuals and groups, as illustrated in Formula 3 in section 1.7. Pawlowsky (2001, p. 76) points out that there have been rarely any attempts to define precisely what collective learning means at this level. In the same way that group level learning requires individual cognition, organizational level learning incorporates and only functions on the grounds of learning at lower levels of aggregation.

The original concept of learning at the organizational level is *intergroup exchange*. Similar to depicting learning as shared interaction between individuals at the group level, it can also be a shared interaction between groups at the organizational level. Such conceptualizing then begs the question of what exactly constitutes the organizational level and how learning between groups goes on procedurally. A proponent of the intergroup exchange concept, Argote (1999, pp. 190-194) regards this notion as self-explanatory, and focuses instead on describing factors that support exchange between groups, such as stable environments or task interdependence. Although Argote fails to specify the concept, she still makes an effort to demarcate some type of exclusively organizational level procedure, while most other theorists in the field simply reify organizations using some macro-level perspective, and completely ignore actual processes. Transcending formal structures, intergroup exchange can be thought of as exchange between informal communities-of-practice. In fact, Brown & Duguid (1991) advocate a view of the organization as an overarching community-of-communities, which would promote the acknowledgement of the many noncanonical communities in its

midst. In such an organization, separate community perspectives can be amplified by interchanges among communities.

But how do groups exchange ideas? How do they communicate? If a reification of the group as a monolithic entity is to be avoided, this question has two likely answers. Groups exchange ideas either through single individuals, such as spokespersons or representatives, or through documents that convey the result of their work.

The first case emerges from the awareness that there is a limit to the number of individuals that can interact in a face-to-face setting. There is no organizational forum where countless actors share a direct, communicative relationship. Interaction through communication, in the form of verbalization or action, is restricted to small numbers of people. Modern technology such as electronic discussion boards or email groups might function as an enabler here, but generally does not solve the problem of participation limits to direct communication. In addition, information technology easily deprives communicative interaction of a location as a point of reference that can facilitate learning. Edmondson (2002, p. 142) realizes this by saying that

> "...the collective learning process in an organization is inherently local. The learning process itself necessarily focuses on some bounded task or opportunity, and it occurs through conversations among a limited number of independent people."

Therefore, the group's diversity of individual cognitions has to be truncated into a communicable form that is transported by one or a few individuals, who act as representatives. When these individuals then meet other individuals, representing other groups, they form a new group, in which they formally or informally exchange the distillate of their groups' prior learning. This quintessentially reduces intergroup exchange to another form of group learning. The learning from one group is processed further in another group.

The second way in which intergroup exchange might be described directly hints at the form of learning that is usually exclusive to the organizational level. Since direct communication as a means of interaction and learning is not an option for collections of individuals beyond the group level, the medium of exchange has to take on a different format. As organizations mature and grow larger, they outgrow their ability to rely entirely on personal, spontaneous interactions (Maier et al., 2001). In order to overcome the restrictions of direct communication, the results of individual and group learning

must be preserved in a form that makes them accessible to all members of the organization. They must be *formalized.*

Formalized documentation such as official guidelines, standard operating procedures, mission statements, training manuals, memos, and experience reports are easy to multiply and can be dispersed quickly across large organizations. Formalization captures the essence of what needs to be preserved for the organization and allows for widespread access and further processing through standardized formats. As a result, condensed knowledge can be fed back into individual cognition and group communication. This then refutes the notion of intergroup exchange as a separate form of learning at the organizational level altogether, because it can either be described as another form of group learning, as outlined above, or as formalization. However, formalization cannot capture all the ongoing and consolidated learning at the individual and group level. It usually involves negotiation processes, process delays, and might often be largely determined by influential individuals. Thus, formalization has a reductive element, a necessary decrease in the richness of individual representations, to enable subsequent uses of generated knowledge by previously uninvolved parties. As written documentation generally implies an official status to its contents and has to be produced with more effort than spoken words, it commonly conveys only the substrate of prior learning activities, the approved consensus.

Formalization differs from forms of learning at other levels in that it paradoxically does not involve most individuals who constitute the organization. While group level learning can in principle proceed without some members of the group, the actual formalization process only requires very few individuals that extract agreed contents and arrange them in a new medium. Moreover, formalization lacks such an active, generative element as individual cognition and group communication, while it approximates knowledge retention and overlaps with memory concepts. As a result, it seems fair to assume that the majority of learning as knowledge creation happens at the individual and group level.

Particularly in bureaucratic organizations, there are also formalized types of regular communication (Tschan, 1992), for example meeting minutes, which should not be confused with the extraction of knowledge for organizational purposes that is elaborated here. Approaches to formalization as an organizational level concept have appeared under such labels as crystallization (Nonaka, 1994) or institutionalization (Crossan et al.,

1999). Especially Crossan et al.'s work essentially captures the arguments put forth here, but fails to recognize written documentation as the key process variable.

Given the inherent element of retention in the formalization process, the conceptual border to organizational memory might be hard to define. These issues will be discussed in the following sections on memory.

In summary, on the basis of a distinct understanding of different levels of analysis, one can proceed in delineating learning processes. Different forms of information processing were established at different levels of analysis: *Cognition* on the individual level, *communication* on the group level, and *formalization* on the organizational level.

From the discussions above it appears that the elaboration and conceptual clarity of learning processes decrease as the level of aggregation increases. While individual learning has been researched ever since the inception of psychology as a scientific discipline, learning at the group level through interaction, sharing, and dialogue has received less attention. This is especially true for the organizational learning literature, where the group level is often completely ignored. A preoccupation with individual cognition, strongly established in the history of the field, has spawned a certain inadequacy amongst organizational theorists in addressing issues of a systemic and collective nature for the research on group and organizational level learning. The organizational level is probably most under-specified, as researchers generally do not delve into inherent processes, but theorize about organizations in somewhat behavioralist terms. A reason for the gradient in conceptual clarity might be that an explicit distinction of different levels of analysis has only been introduced to the organizational learning discussion fairly recently. In addition, exploration and testing of theoretical concepts faces increased difficulty when empirical settings involve groups or whole organizations in the real world, instead of individuals in a laboratory. Finally, it must be emphasized that the processes depicted here should be expected to be strongly interrelated. Learning at higher levels of aggregation not only incorporates prior 'lower level' learning, but also feeds back into processes further upstream (von Cranach et al., 1986). Individual cognition, group communication, and formalization at the organizational level always occur on the basis of prior experience.

1.8 MEMORY AT DIFFERENT LEVELS

A core component of organizational learning must be, by definition, organizational memory since no learning can take place in an organization unless it possesses an adequate memory system (Kihlstrom, 1996). Any basic textbook on learning and memory concludes that learning requires and only functions with memory (e.g. Houston, 1991). Bluntly speaking, while learning has to do with acquisition, memory has more to do with storage, but new acquisition will be influenced by what is already stored; the two parts are interconnected. Following that rationale it becomes clear that any comprehensive theorizing on organizational learning has to include and will be enhanced by an understanding of memory at the collective level (Weick, 1979, p. 206). Huber (1991) stresses the point of the effectiveness of organizational memory as a determining factor for the demonstrability and usability of learning by noting that information acquisition, information distribution, and information interpretation all substantially depend on references and frameworks stored in memory. All these notions provide assurance of the crucial dependence of learning on a form of memory, and describe memory as a key component for theorizing in the focal field (Casey, 1997; Duncan & Weiss, 1979; Simon, 1991).

Research on human information processing generally categorizes three subprocesses inherent to memory operations, namely *acquisition*, *retention*, and *retrieval*. These processes often overlap or merge. Information and knowledge is first obtained through functions of perception and learning, then stored in memory repositories, and can finally be recovered for further use. Taking into account the previous discussion on levels of analysis, it is also important to distinguish between memory processes of individuals, groups, and organizations (Anand, Manz, & Glick, 1998). Thus, we arrive at a three by three matrix, as illustrated in *Table 1.4*, where the processes are tightly intertwined, while the levels of analysis allow for a clearer distinction. Since organizations consist of individuals and groups, it should be noted that processes and components of individuals' memory are understood as part of group memory, as much as the memory of various groups is part of the larger concept of organizational memory.

Table 1.4: Memory issues across levels of analysis

	Individual	Group	Organization
Acquisition	Encoding through practice, repetition, reinforcement	Encoding through communication that establishes experts and responsibility (transactive) Metaknowledge (directory) of group members' abilities and characteristics Encoding of labels and locations of content	Acquisition mainly through individuals Individuals as basic operators and facilitators
Retention	Located in individuals (cortical areas of the brain) Different compartments, e.g. short- and long term memory	Located in individuals Social network	Located in individuals, culture, transformations, structures, ecology, and external archives; also documents Recent emphasis on computer-based knowledge databases Differentiation between information and knowledge
Retrieval	Enhanced by appropriate cues and meaningfulness of content Generally content-dependent	Determination of location of content Combination of retrieved content from several individuals (transactive) Sharing and integration of content, and generation of new knowledge	Retrieval mainly through individuals, often transactive retrieval Individuals as basic operators and facilitators

1.8.1 Memory at the individual level

Given the main concerns of the present work, a thorough description of individual memory is not intended here. Since many basic textbooks on cognitive psychology provide detailed accounts on the matter (e.g., Anderson, 1995; Eysenck & Keane, 1995; Houston, 1991), a rough overview of major ideas will suffice for the present purpose, and specific literature references are not made.

Much of the research on individual memory, especially on acquisition and retrieval, is concerned with fact-based or declarative instead of procedural knowledge,

and has mainly been studied in laboratory settings. Effective acquisition appears to necessitate practice and repetition, as well as reinforcement. Great improvements in memory acquisition are also achieved as a function of the elaborateness of processing, as can be observed when subjects generate material to be stored in memory themselves. Elaboration can have a powerful effect on acquisition, although it is generally thought that forgetting may be due to retrieval factors rather than to acquisition factors.

The question of how material is encoded leads to observations of the structure of memory, which is organically represented by the cortex. Extensive studies assert that different types of material, such as visual or linguistic memories, are stored in different cortical areas, and that memory content is usually stored in chunks of about three elements. The research on memory structure is heavily influenced by experiments conducted with brain-damaged patients that often suffer from severe memory failure. It has been shown, for example, that damage to the temporal lobe and related structures can result in both retrograde and anterograde amnesia. On a somewhat more descriptive level, multi-compartment models are proposed that distinguish between different levels of processing, or between different stores, such as the sensory, short- and long-term store. The most widespread differentiation is probably made between working and long-term memory, which offers a neat analogy to the structure of modern computers.

Research on retention deals mostly with aspects of forgetting. Memories seem to decay as a function of time, or elaborateness and procedure of initial acquisition. Learning and retention of one set of materials often interferes with the learning and retention of another set of materials. Although there is not a well-established relationship between valence of memory and its retention, material learned in high arousal states is usually retained very thoroughly.

The retrieval of memorized material largely depends on the availability of appropriate retrieval cues. To a large extent, retrieval is context-dependent, both in terms of external surroundings and internal states. When asked to reconstruct compilations of material, such as entire stories, subjects' ability is typically enhanced by the meaningfulness of the content. For other retrieval tasks, differences are also detected between recognition and recall in tests with lists of items. Some characteristics of memorized material determine the ease of retrieval in many cases; visual material, for example, has advantages over verbal material.

When placed in organizations, people generate a wealth of knowledge that largely remains in their heads during the process of doing their work. In sum, people are perhaps the most effective means for storing the organization's experience (Simon, 1991). As a colloquial yet illustrative example, it has been said that if NASA wanted to go to the moon again, they would have to start from scratch, since they might still have the data, but not the human expertise that goes with it.

People in organizations do not exist as independent actors; they constantly interact with others. This leads to alterations in the types and functions of memory when the group is the level of analysis.

1.8.2 Memory at the group level

Memory functions at the group level occupy an intermediate position between individual and organizational memory. Theorizing in this field suffers from a widespread conceptual leap that dichotomizes knowledge residing either within individuals or in formalized organizational repositories. This has to do in part with the intuitive tangibility of memory locations, which is clear for individuals (i.e. the brain) and to some degree organizations (e.g. knowledge management databases), but becomes somewhat elusive when the focus is on groups. A cognitive perspective and the notions of informal interaction and exchange further complicate the issue (Kihlstrom, 1996).

Experimental research on group memory has traditionally focused on ad hoc groups and classical memory tasks, such as the learning of nonsense syllables or the recall of stories. As the processes mediating group memory, or more fundamentally, the very nature of group memory, seem to be crassly reduced and misunderstood in such works, the need to account for core elements of collective interaction was recognized (Bangerter et al., 1997). Recent approaches to group memory are frequently embedded in broader discussions of team or group mental models (Mohammed & Dumville, 2001), which refer to an organized understanding of relevant knowledge that is shared by team members (Klimoski & Mohammed, 1994). In this debate, shared cognition is an integral part of group existence and activity, and embodies the task-related coordination of individuals (Cannon-Bowers & Salas, 2001). A different approach derives from research on group performance, and the finding that the composition of a group plays a decisive role in facilitating and enabling good or bad performance (Moreland & Levine, 1992). Since it might not always be practical to change group composition, the focus

turns towards using given human resources in the best way possible. Hence, abilities of group members must be known in order to allocate tasks. This knowledge of people's characteristics traditionally resides with a manager, but as work groups increasingly become independent and self-managed, such knowledge then has to be dispersed across individuals and become somewhat shared. The two approaches merge on the assumption that a mutually compatible, shared understanding of interactive patterns and individual capabilities has a distinct potential to improve group performance and efficiency. Groups who know each other well or who have experience of working together in the past are likely to solve given tasks better than comparable groups of strangers (Liang, Moreland, & Argote, 1995). The metaknowledge members acquire enables them to identify the location of individual expertise among other members, and therefore to expand their own specialization of knowledge by utilizing the cognitive resources of others. As a result, memory in groups becomes a social phenomenon.

A particularly compelling conceptualization that takes into account the described social dimension is *transactive memory*[8]. Wegner (1987) first described transactive memory as the shared division of cognitive labor with respect to the encoding, storage, retrieval, and communication of information from different domains. The concept originally stems from research on intimate relationships and focused on how information that enters relationships is encoded (Wegner, Erber, & Raymond, 1991; Wegner, Guiliano, & Hertel, 1985). It could be shown that people extensively make use of external storage for everyday memory tasks. External storage in this context signifies not only inanimate objects like diaries or notepads, but also other people. Successful retrieval from external storage according to Wegner (1987) requires the prior encoding of two pieces of information about a given item, namely a retrieval cue or label, and a location. For the example of a phone number, the label could be "John's number" and the location the object "my diary" or the person "my mother". Referring to the latter, the core notion of transactive memory is that people can be locations of external storage for the individual. As groups gain experience, they generate knowledge of who is good at what, whom to trust, and how to coordinate and communicate with one another. At the group level, it is

[8] It is recognized here that there are several literatures, which are clearly relevant to the broader discussion of team or group mental models and shared cognition, such as information sharing, cognitive consensus, team decision making, team situation awareness etc. However, this section focuses on memory research, and transactive memory is to my knowledge the only model that integrates the notions of memory, sharing, and interaction at the group level.

crucial for each member to acquire metaknowledge about others' abilities and characteristics (Moreland, 1999). The information held in a group's memory can therefore be separated into two components: The information stored by group members in their individual memories, and directories held by group members that recognize the existence, location, and means of retrieval of information held by other members.

The link between individuals' expertise in groups is constituted by communication (Hollingshead, 1998). In transactive encoding, people talk about and evaluate incoming information in order to identify the meaning and subsequent storage location. Prior communication has established experts and their respective knowledge domains, and their future responsibility for information pertaining to that domain has been asserted (Hollingshead, 2000). Transactive retrieval entails determining the location of information and often comprises the combination of retrieved input from several locations. Consequently, a group is capable of accomplishing integrative processes in memory that generate new knowledge. Although the combined pool of expertise expands, the systemic structure reduces the cognitive load of each individual, and decreases redundancy of effort. In sum, the described communication between individuals constitutes a group information-processing system that stands for more than the sum of its individual components.

Wegner et al. (1985) suggest two structural qualities that characterize transactive memories. Differentiation refers to the storage of dissimilar items in different individuals. Nevertheless each individual knows labels and locations of items they do not hold personally. Integration relates to a memory system where many members hold the same items of information and are aware of the overlap. The two characteristics represent opposite ends of a continuum, and an optimal management in this respect depends on the task at hand.

In conclusion, the concept of transactive memory draws heavily on an analogy to computer networks, with each computer containing its own memory as well as a directory of other computer memories in the system (Wegner, 1995). Empirical evidence of this model of group memory has been provided, although much of the research involves couples rather than groups, and has been conducted in the laboratory (Moreland, 1999). However, an important contribution is that "transactive memory incorporates the system of interconnections that exists in individuals' communications and, hence, places direct emphasis on the social organization of diversity..." (Wegner, 1987, p. 206). The concept proves vital for an understanding of internal processes of organizational learning,

as it persuasively affirms the notions of informal interaction, communication, and sharing to the theoretical discussion.

1.8.3 Memory at the organizational level

A point has been made earlier about elements of information processing being acquisition, retention, and retrieval. Such essentials must be similarly assumed for memory at the organizational level. However, the increasingly complex and often geographically dispersed nature of large organizations implies that a memory concept at this level will have to fundamentally differ, for example in defining the locus (since organizations do not have brains like individuals), from the ones introduced so far.

The location of memory repositories seems to be the dominant theme in the scientific debate. Where an organization stores information, or from where it retains its generated knowledge, receives a lot more interest than the question how memory content is acquired or retrieved. The use of such terms as 'storage' and 'repository' promotes an understanding of memory content as a collection of discrete units that are precisely labeled and that can be packed away like books in a library. This obviously defies the idea of information processing at a collective level as a social and interpretative activity (Daft & Weick, 1984), but such language is apparently very appealing.

Concerning the locus of organizational memory, concepts of varying sophistication can be found in the literature. Cyert & March (1963) see memory as contained in accepted procedures, Argyris & Schön (1978) identify people and documents as storage facilities, and Weick (1979) perceives people, rules and files, and computers as the main components (for a detailed account of works that define and measure organizational memory in different disciplines see Stein, 1995). Deriving from their definition of organizational learning, Levitt & March (1988) claim that lessons of experience are maintained and accumulated within routines despite the turnover of personnel and the passage of time. The actual recordings are stored in individual memories, documents, accounts, files, standard operating procedures, rule books, in the social and physical geography of organizational structures, in standards of good professional practice, in the culture of organizational stories, and in shared perceptions of "the way things are done here" (p. 327).

Walsh & Ungson (1991) provide a more systematic structure to their concept of retention facilities and also discuss processes of acquisition and retrieval in their influential paper. They first define information about past decisions and solved problems as the core of an organization's memory over time. Organizations process information and "exhibit memory that is similar in function to the memory of individuals" (p. 60). In consequence, a central role of the individual is affirmed. Hence, it could be stated that, as in the case of organizational learning, the individual is the principal agent of organizational memory. Individuals acquire information about a particular stimulus event that triggered a decision-making process as well as the organization's response to that stimulus. Similarly, individuals retrieve information from memory, on their own or as a collective (as in transactive memory), in either a conscious or an intuitive manner. So far then, Walsh & Ungson's conceptualization of organizational memory is short of a distinctively 'organizational' note. However, they emphasize that the process of sharing permits the transcendence of individual cognitive facilities. Moreover, and most notably, these authors identify a set of uniquely organizational memory repositories. They posit the existence of five storage bins within and one storage facility outside the organization. First, there are individuals who retain their experiences and observations in their own memory, their belief structures, assumptions and values. Second, the culture of an organization as a way of perceiving, thinking, and feeling about problems contains memory contents in language, shared frameworks, stories, sagas, and the grapevine. Third, as organizations are constituted of transformation processes (i.e. input-throughput-output) those transformations are retrieved in standard operating procedures, rules and formalized systems. A key function of administrative systems is the creation and recording of formalized procedures. Fourth, formal and informal codifications of 'correct' behavior as a substrate of individual and collective role behavior are reflected in the structure of an organization. Fifth, the actual physical structure or workplace ecology of an organization also functions as a repository of organizational memory, often reflecting the status hierarchy. The sixth storage bin of organizational memory is located outside of an organization and elucidates that an organization itself is not the sole repository of its past. Thus, external archives such as former employees (depending on the length of tenure), competitors, the government, governmental regulatory bodies, task forces, financial service firms, and business historians can serve as chronicles of an organization's past. Each of the five internal storage locations varies in its capacity to retain information, but all are interconnected, that is, their respective contents might

overlap to a certain extent. Given all the different locations, an organization can retain its memory contents despite personnel turnover, although individuals might be understood as the basic operators of any form of storage facility (after all they largely determine what information will be acquired and retrieved). Therefore, organizations can memorize independent of any specific individual, but not independent of all individuals. Accordingly, Walsh & Ungson (1991) point out that the retention of organizational memory is not just an individual-level phenomenon, but can apply to a supraindividual collectivity as well through a process of sharing (p. 68), as already mentioned.

From Walsh & Ungson's (1991) systematization it should be clear that information technology can only serve as an operational vehicle for the preservation of organizational memory and one with obvious input and output limitations, too. While standard operating procedures, transformation processes, formal job descriptions, and even individual experiences can apparently be easily computerized, subtle but important notions of an organization's culture, codifications of role behavior or implicitly shared assumptions can mostly not (Anand et al., 1998; Brown & Duguid, 2000). Olivera (2000), who is theorizing on a somewhat more operational level, tries to alleviate this dilemma by proposing a concept of organizational memory systems that are constituted through computer-based technology and social networks. Although he raises awareness about memory issues of geographically dispersed organizations, he fails to specify how the interpretive nature of knowledge can be computerized, which essentially then leaves information technology as a simple facilitator for the storage of discrete content units. Further downstream from acquisition in the learning and memory process, the heavy influence of the emerging works in computer science on psychological research since the 1960s can be stressed by an often present ignorance of the (re)constructive nature of human and presumably organizational memory. Corbett (2000, pp. 286-287) concludes:

> "As a consequence [of the influence of work in computer science] the idea that remembering is an active process involving reconstruction, elaboration and invention has been displaced by the notion of memory as a relatively passive data storage and retrieval facility. [...] Research on social memory conducted by sociologists and social anthropologists reveals how reality is reconstructed as an outcome of shared memories rather than an input to their construction." (parentheses not in original)

The detailed listing of possible storage facilities generates the thought that not all kinds of memory content might be equally applicable to any kind of memory locus and leads to a necessary discussion of memory content.

In the view of the open systems paradigm, organizations engage in transformation processes in which they utilize and create information and knowledge. Although the terms information and knowledge are often used interchangeably, there is a clear distinction. While information is a flow of messages or meanings, knowledge is created and organized by the very flow of information, based on the commitment and beliefs of its holder (Nonaka, 1994). On a more technical note, knowledge has been described as the "individual ability to draw distinctions within a collective domain of action, based on an appreciation of context or theory, or both" (Tsoukas & Vladimirou, 2001, p. 979). Brown & Duguid (2000) elaborate extensively on the distinction between information and knowledge, and provide illustrative arguments against the treatment of knowledge as a tangible commodity. They state that knowledge, first of all, usually entails a knower. There is a strong personal attachment, which exacerbates effortless detachment and transfer, and contrasts ideas of shipping, receiving, and quantification. In addition, there is an assimilating connotation to knowledge. It needs to be somewhat digested, and entails the knower's understanding and some degree of commitment (p. 119-120). Knowledge can be further differentiated into tacit knowledge and explicit knowledge (Polanyi, 1958). Explicit knowledge is descriptive or procedural knowledge that is transferable in formal, systematic language. Tacit knowledge is more problematic to communicate, as it has a personal quality and is rooted in action, commitment, and involvement in a specific context. As such, a lot of knowledge concerning organizational culture, personal values and implicit role behavior can be classified as tacit. In contrast to explicit knowledge, tacit knowledge is not likely to be documented and recorded in formal memory repositories and is created and retained through processes of personal experience and socialization. One would therefore expect individuals to be the prime facilitators of tacit knowledge.

Another parameter in the discussion of organizational memory that is worth mentioning are the retention characteristics in terms of their temporal aspects. As in the individual case, memorizing on an organizational level can also be divided in short- and long-term processes. But while a definition of the extent of short-term and long-term memory for individuals is quite simple, this might not be the case for organizations. Different organizations operate at different speeds and a time span of a few hours may be considered fairly short-term by an organization producing weather forecasts, while the same time span will be considered long-term for organizations dealing in financial mar-

kets. As Stein (1995) notes, duration within an organization therefore relates to the rate of organizational and environmental change and to the perception of its members. Temporal aspects of organizational memory content also relate to the different memory storage facilities. Accordingly, an organization's culture, structures and external archives appear to hold more of the long-term memory, while it can be argued that the other repositories hold a bit of both, short- and long-term memory. In the case of the individual as a repository, this might be a function of the length of service in the organization.

Adopting an individual level memory concept, the content of short-term memory might need to be transferred to long-term memory in order to be accessible and retrievable over time. Under certain circumstances, however, knowledge disappears from an organization's active memory. Such cases could include the hiring of a large number of new organizational members, role conflict or conflict with other normative orders, or weaknesses of organizational control (Levitt & March, 1988). And finally, another view on the temporal aspects of memory is that some knowledge might need to be discarded altogether from time to time in order for the organization to be able to function effectively. This idea is labeled 'unlearning' and has been discussed in the previous pages on the different types of organizational learning. It might be concluded that whether the memory of an organization supports or hinders its ability to learn depends on how well its past solutions can be adapted to fit the problems of the present circumstances (Hargadon & Sutton, 1997).

1.9 THE PROCESS OF ORGANIZATIONAL LEARNING

Throughout the theoretical part of this text, an attempt has been made to identify, discuss, and map the different aspects and facets of learning and memory across levels of analysis. The adoption of a process view has led to the description of concepts in functionalist terms, with a focus on characterizing information processing through cognition, communication, and formalization.

Using Kolb's experiential learning cycle, it was made clear that action is closely related to individual learning. The same can be said for learning at the group level, as knowledge creating communication generally revolves around action. This accords with the ideas mentioned earlier by Weick & Roberts (1993), who explain their concept of collective mind as inherent in the pattern of interrelated activities among many people.

Based on the tradition of individual action theory, von Cranach et al. (1986) elaborate on the group level and firmly establish action alongside group information processing. Further development by Swiss scholars in this realm extends to the organizational level and corroborates formalization as level-specific, goal-oriented behavior grounded in action (von Cranach & Tschan, 1990).

Internal processes as the core of theorizing on organizational learning have received comparatively moderate attention. The few attempts to look 'inside the organization' and specify what is to be found create little consensus in the field. In fact, "the nature of learning processes is probably the issue over which scholars still diverge most." (Bertoin Antal et al., 2001b, p. 929). But extensive discussions of learning and memory components ultimately call for integration into a dynamic process model. This allows for a clarification of the focal construct as a whole, and comprehensively illustrates theoretical assumptions in a graphic format. A number of process models or frameworks have been proposed. In *Table 1.5* an overview of these models is provided, and they are assessed according to key featured established so far. Included were conceptualizations that comprise a sufficient degree of detail to be considered actual process models. In the following, a selection of those (not in exact chronological order) will be discussed for their strengths and weaknesses.

The first conceptualization of collective learning dynamics can be ascribed to March & Olsen (1975), who devise a systemic model of the process of organizational[9] learning. They describe a circular process in which individual action based on individual beliefs leads to organizational action, which triggers an environmental response that, in turn, affects individual beliefs (see *Figure 1.3* for a modified version). Although the model does not attempt to explicate processes in great detail, even at a superficial level it fails to adequately mediate between the individual and the collective level. The question of learning remains conspicuously vague. Roth (1992, as cited in Kim, 1993a, p. 39) identifies four shortcomings in March & Olsen's model: inattention to stimuli interpretation and sharing of meaning among individuals, lack of consideration for structural elements impeding learning, focus on the organization as a learning environment of individuals, and emphasis on environmental response to organizational actions. As March

[9] Most authors who do not distinguish between the group and the organizational level of analysis generally use the term 'organizational' to describe any learning beyond the individual level.

& Olsen (1975) see learning primarily driven by environmental responses, they do not describe what learning occurs *within* an organization, a priori independent of the outside environment.

Table 1.5: Process models of collective learning

	General characteristics	Levels of analysis	Memory components	Feedback functions	Notions of interaction, sharing and dialogue*
March & Olsen (1975)	Cyclical model; iterations between individual beliefs, individual and organizational actions, and environmental responses	Individual Organization	None	Feedback through environmental response	None
Huber (1991)	Non-dynamic framework outlining constructs and processes of organizational learning with associated subprocesses	Individual Organization	Storage (often computer-based) and retrieval of information is critical to learning; memory as an integral component	None	Information distribution within the organization and subsequent shared information interpretation are key processes
Kim (1993)	Cyclical model; iterations between learning, action and environmental response; key link between individual and shared mental models	Individual Organization	Indirect (learning is retained as mental models for both the individual and the organization)	Feedback through environmental response	Shared mental models at the collective level, consisting of the organization's worldview and its routines
Dixon (1994)	Cyclical model; iterations between theory and action, applied to accessible meaning structures	Individual Organization (existence of a group level is acknowledged but not elaborated)	Indirect (conceptualized private and collective meaning structures)	Feedback through effects of action	Through organizational dialogue, private and collective meaning structures are made accessible to others
Nonaka (1994)	Cyclical model; iterations between tacit and explicit knowledge creation through four modes (socialization, internalization, externalization, combination)	Individual Group Organization	None (no explicit conceptualization)	Feedback through justification of created knowledge by means of quality standards, and through networking of knowledge	Crucial dialogue between tacit and explicit knowledge; knowledge creation through sharing of members' experiences and perspectives
Coghlan (1997)	Cyclical model; dynamic interlevel process that starts at the individual; essentially Kolb's learning cycle on all levels	Individual Group (Interdepartmental group or unit) Organization	None	Feedback through effects of action	Dialoguing and interaction at the group and intergroup levels create new data
Crossan, Lane & White (1999)	Linear model; dynamic process of intuiting, interpreting, integrating, and institutionalizing	Individual Group Organization	None (memory is somewhat associated with the institutionalizing phase)	Feedback through exploitation of institutionalized knowledge; feed forward through assimilation of new knowledge	Dialogue and joint action are crucial to the development of shared understanding during the interpreting and integrating phases
Edmondson (1999)	Linear model focusing on team learning and its antecedents and consequences	Group	None	Feedback through group member interaction	Sharing and interaction as the core of group learning
Williams (2001)	Minimalist component model with reciprocal influences; centered on management decision making	Individual Organization	Unspecified hints to individual belief systems and organizational culture	Feedback through confirmation or disconfirmation of (managers') beliefs	None (interaction is necessary for the development of individual belief systems)
Lahteemaki, Toivonen & Mattila (2001)	Cyclical model; describes learning and change as interactive processes towards the internalization of implemented changes	Individual Organization	None	Feedback through the implementation of change and the creation of favorable conditions for further learning	None (collaboration is mentioned but not elaborated)
Yeo (2002)	Linear model combining goal-related learning across levels of analysis	Individual Group Organization	None	Feedback through the influence of organizational learning goals on strategic management	None
Lipshitz, Popper & Friedman (2002)	Semi-dynamic framework describing contextual, policy, psychological, cultural, and structural facets of organizational learning	No explicit specification of levels	None (unspecified conclusion that organizational learning produces changes in norms, doctrines, standard operating procedures, structures, and cultures	None (although actions as the result of productive learning should lead to new behavioral strategies)	Organizational learning mechanisms within which individuals may ('non-integrated') or may not ('integrated') share and interact. Both versions can facilitate organizational learning
Holmqvist (2003)	Matrix model of dynamics of intra- and interorganizational exploration and exploitation	Organization Inter-Organization	None	None (it remains unspecified how a feedback-dependent balance between exploitation and exploration is achieved)	Sharing and interaction between organizations enables interorganizational learning

*Organizational learning more than collective individual learning

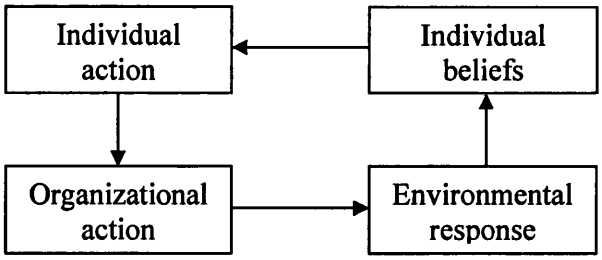


Figure 1.3: March & Olsen's model of organizational learning

Going back to the discussion on different types of learning, such as single- or double-loop learning, an inherent assumption of different stages of increasing sophistication and complexity is usually made. The learning types propose a hierarchy of learning with evolutionary connotations, an assumption of constant adaptation and progressively desirable learning stages. Contrasting the hierarchy assumption, cyclical models suggest that organizational learning is an iterative process, which involves the combination of different activities in order to work efficiently (Easterby-Smith, 1997). As an example, Dixon (1994) develops an organizational learning cycle which requires iterations between theory and action, and although there is the idea of progress there is no particular end point. Similar iterative processes form the core of Nonaka's (1994) spiral of organizational knowledge creation. This model combines four modes in the creation of tacit and explicit knowledge: socialization, externalization, internalization, and combination. Knowledge creation centers on the interchange between the tacit and explicit aspects of knowledge through internalization and externalization. But in order to actually generate new organizational knowledge, there needs to be a dynamic interaction between all four modes of knowledge creation in the form of a continual upward spiral moving from the individual level past the group level to the organizational level.

The constructs and processes that Huber (1991) associates with organizational learning deviate from the hierarchical ideas and cyclical models in regard to their somewhat linear character. Instead of theorizing about qualitatively different hierarchical stages or iterative steps, he emphasizes a value-free chain of events of organizational learning by postulating four inherent phases and their various subprocesses. In the first phase of knowledge acquisition, knowledge is obtained through processes of congenital learning (e.g. inheriting knowledge), experimental learning, vicarious learning (i.e. learning from others), grafting (i.e. acquiring new members) or searching and noticing.

The second phase of information distribution determines the occurrence and breath of organizational learning by incorporating all of the organization's components and units. Once distributed, information needs to be interpreted. The outcome of this interpretation process depends on parameters such as the cognitive maps of people involved, the richness of the transmission media, potential information overloads, or unlearning. Finally, in the fourth phase of organizational memory, knowledge is stored for further use.

Kim (1993b) proposes an integrated model of organizational learning, explicitly addressing the link from individual to organization level, whose conceptual elaboration makes it very appealing, but also conceals key weaknesses. In his article entitled "The link between individual and organizational learning", as Tsang (1997) notes the only thorough exploration of this relationship in the literature (although Kim completely overlooks the group level), Kim begins his argumentation in line with many other researchers on the notion that organizations ultimately learn via their individual members. Based on the Lewinian experiential learning model, Kim presents his own model of individual learning. This model deploys a learning cycle of observation, assessment, design, and implementation functions that stands in reciprocal relation with individuals' mental models; that is, internal images of how the world works consisting of frameworks and routines. Before integrating his suggestion into a larger scheme, the author addresses some fundamental issues in devising a model of organizational learning:

> "A model of organizational learning has to resolve the dilemma of imparting intelligence and learning capabilities to a non-human entity without anthropomorphizing it." [...] "...if a distinction between organization and individual is not made explicit, a model of organizational learning will either obscure the actual learning process by ignoring the role of the individual (and anthropomorphizing organizations) or become a simplistic extension of individual learning by glossing over organizational complexities". (p. 40 and pp. 42-43, parentheses in original)

The model of individual learning is then incorporated into a larger model of organizational learning, as shown in *Figure 1.4* (Kim, 1993b), by illustrating a transition from individual mental models to shared mental models, comprising organizational routines and *weltanschauung* (worldview). The learning cycle and mental models are complemented by downstream individual and organizational action components that exercise influence on environmental responses. Thus the link between individual and organizational learning is identified as the transfer of learning through the exchange of individual and shared mental models. This process allows organizational learning to be in-

dependent of any specific individual (but not of all individuals). The exchange can be explicated in the way of Argyris & Schön's (1978) idea of double-loop learning, providing that organizational learning is dependent on individuals improving their mental models. Single-loop learning occurs when error correction proceeds by changing action strategies within a constant framework of norms of performance. Double-loop learning involves restructuring of norms and fundamental changes in frames of reference or theories-in-use. Individuals, however, have to make their mental models explicit to allow for the development of new, shared mental models. This, as Kim notes, can often become problematic because it appears difficult to articulate mental models since they are a mixture of what is learned explicitly and absorbed implicitly. One method to overcome problems of articulation and observation is the learning laboratory as advocated by MIT's former Center for Organizational Learning (Senge, 1990a).

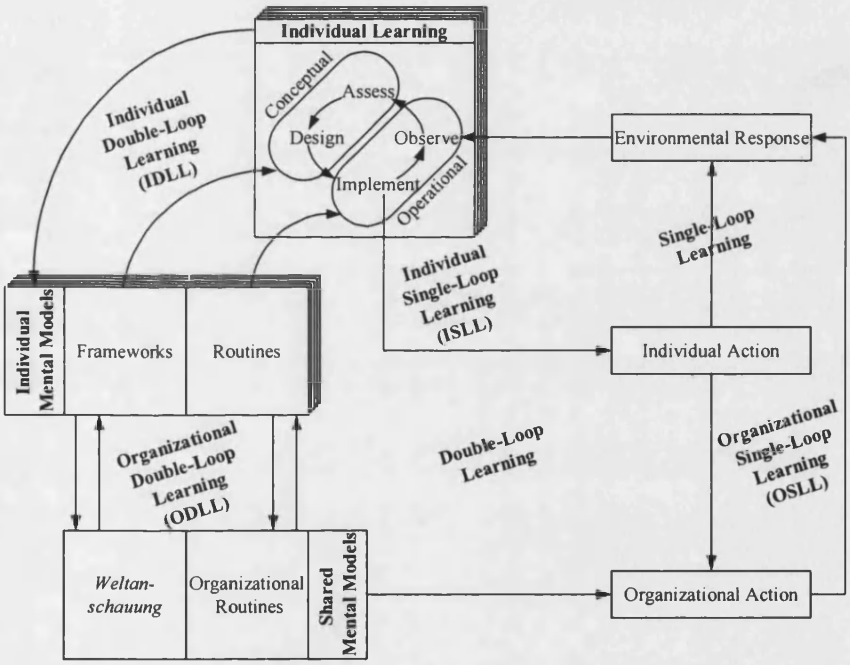


Figure 1.4: Kim's integrated model of organizational learning

In summary, Kim's (1993b) model deserves consideration because it identifies and interrelates crucial elements of the learning process in detail. Advantages, apart from a persuasive graphical representation, are an emphasis on communication (which is not graphically represented, though), and a clear relation to action, which also functions as an indirect feedback loop. Contrasting these advantages are critical aspects that

Kim leaves underspecified, most prominently the exact nature of the link between individual and organizational learning. How are individual mental models communicated and exchanged with the collective? Once they are exchanged, negotiated, and amalgamated, which ones are dominant enough to contribute to the shared models? Kim understands mental models as a type of active, working memory that is somehow shared and remodeled for collective purposes. How this is done procedurally remains vague. In addition, a group level is omitted entirely, and the completeness of the included memory components might be questioned.

A last framework that deserves detailed attention has more recently been proposed by Crossan et al. (1999; see also Vera & Crossan, 2004). These authors identify four processes that link the three levels of analysis in ascending order, namely intuiting, interpreting, integrating, and institutionalizing. Individuals are believed to recognize patterns in their experiences, which demands interpretation either alone or in a group. A shared understanding that evolves out of the interaction with others is then integrated into group processes. In the final stage, institutionalization of tasks and mechanisms ensures that routinized actions occur. The four dynamic processes shift learning as a feed forward sequence from the individual via the group to the organizational level, while utilizing already established content as feedback. Crossan et al.'s framework is compelling because it delineates learning as a dynamic process across interrelated levels of analysis. In addition, it confirms the importance of such elements as communication through verbalization and action, and feedback to lower levels of aggregation. However, the crucial memory component is strikingly underdeveloped, as only the phase of institutionalization provides a vague hint at retention functions. This leaves an otherwise promising framework somewhat incomplete.

Given the work by Kim (1993b) and Crossan et al. (1999), the idea of an integrated framework of learning and memory processes across levels of analysis shows potential. Throughout the discussion so far, a comprehensive list of integral components as well as shortcomings of prior frameworks have been identified and characterized. The outlined concepts in the earlier chapters on learning and memory offer substantial clarity and precision to alleviate such shortcomings. Hence, on the basis of lessons learned about previous inadequacies, and the current theoretical discussion, a new dynamic process framework of learning across levels of analysis is proposed in *Figure 1.5.*

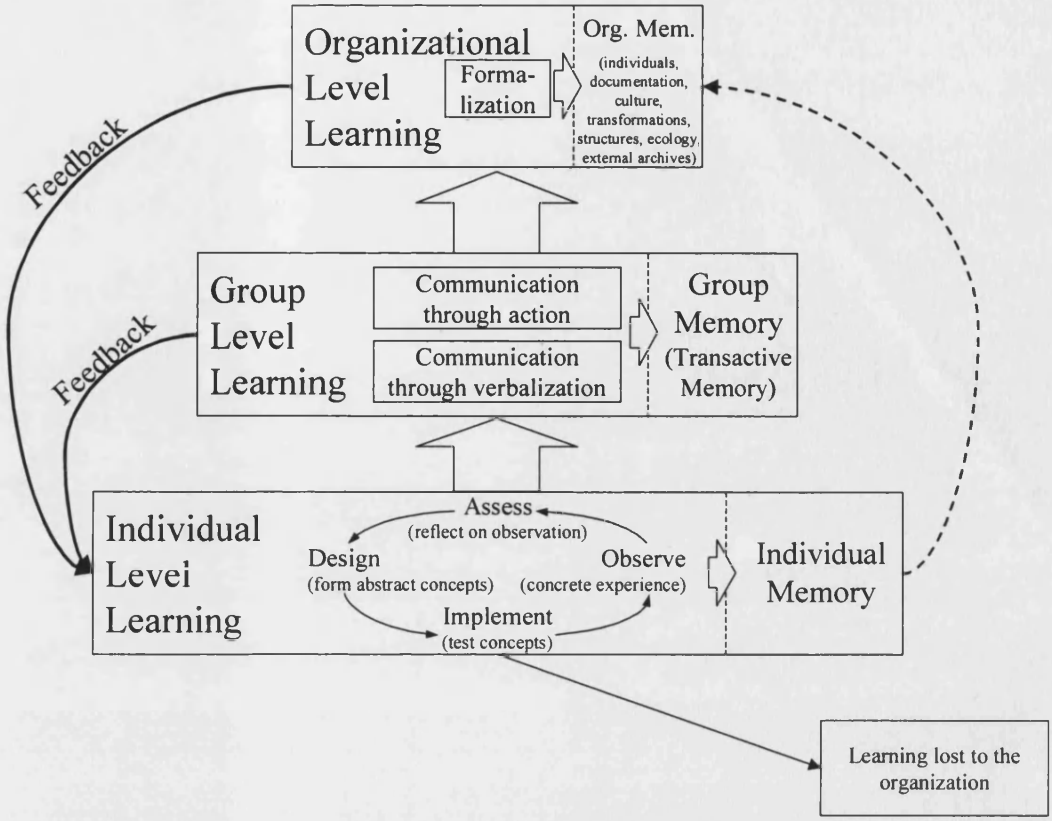


Figure 1.5: An integrated framework of learning and memory

The framework illustrates an integrated sequence of processes that are dynamically interrelated. Learning grounded in experience that occurs at the individual level is

which might also occur when experienced staff leaves the organization. Individuals can also circumvent or ignore the group level and instead influence the formalization process directly. This might especially hold for powerful individuals such as board members or information gatekeepers (Daft & Weick, 1984; Staw & Sutton, 1992). The framework describes a balance between exploration through feed forward, and exploitation through feedback (Crossan et al., 1999).

The integrated framework organizes all of the fundamental elements discussed so far into a cohesive cyclical structure. It addresses learning and memory issues at three levels of analysis and thereby characterizes a transfer of learning that is sustained and augmented by feedback. Generated knowledge is assessed by individuals and enters the sequence anew. The sequence is continuous, although learning is manifested in different processes for individuals, groups, and organizations. Hence, establishing cognition, communication, and formalization as fundamentally different yet interrelated forms of information processing, the framework systematizes the flow of learning despite a discontinuity[10] of processes.

In the remainder of this text, the integrated framework is used as the theoretical foundation upon which the introduction of resistance to change to the organizational learning discussion rests. It functions as a point of origin that structures the methodological approach of the empirical part of the study. It constitutes as a building block for theory development, but will be, however, held susceptible for conceptual challenges or structural improvements resulting from empirical findings.

1.10 Summary

The first chapter contained a comprehensive review of the organizational learning literature, culminating in the proposal of a procedural framework that pulls together the discussed aspects and components of organizational learning, and that will guide further exploration. The building of a revised theoretical conceptualization was felt necessary because of the fragmented and often incoherent nature of the organizational learning

[10] According to House et al. (1995) discontinuities are different manifestations of similar variables (in our case learning) at different levels of analysis.

literature, inadequacies of earlier frameworks, and a need to provide guidance for an empirical inquiry.

The term organizational learning has a history of being used metaphorically to describe adaptation, comprehension of complexity, knowledge creation, or intelligence. The essential distinction in the literature is found between the concepts of the learning organization, which pertains to a rather symbolical use employed mainly by action-oriented practitioners (as exemplified by Senge, 1990a), and organizational learning, which refers to the theoretical and empirical analysis of learning processes in organizations (an approach starting with the work of Cyert & March, 1963). This thesis concentrates on the latter perspective.

In order to develop a substantiated theoretical position, some important concepts within the realm of organizational learning were introduced. Different types of learning illustrate the quality of learning outcomes. Internal power relations might influence the expansion of learning in organizations. Exploration and exploitation are two notable learning strategies, describing approaches based on the development of new ideas or the optimization of existing ones. In addition to these related concepts, it was also pointed out that organizational learning has been investigated from the perspectives of various scholarly disciplines, each one with a different set of potential contributions and inherent research interests. Stemming from such found diversity arose the need to consider some fundamental questions about organizational learning in order to further position this thesis in the academic debate.

First of all, the question of whether learning at the collective level is at all a feasible concept is confirmed by research on learning curves. This refers to the finding that production costs and errors in industrial settings decrease over time as groups and organizations become more experienced. The learning curve findings, however, point at two aspects that are deemed detrimental to the development of a detailed understanding of organizational learning, namely the treatment of learning as an outcome and the direct association of learning and performance. Hence, in this thesis a procedural perspective on learning is employed that recognizes a potential incongruity between prior learning and subsequent expression in observable behavior.

Three levels of analysis - the individual, the group, and the organization - were then distinguished in order to specify the discussion of learning processes. It was argued that true organizational learning needs to involve individual level learning, group level learning, and organizational level learning. In addition, a memory function is required at

each level of analysis, since the possibility to store and retrieve knowledge is a crucial condition for learning to occur. Learning processes were identified as cognition at the individual level, communication through action or verbalization at the group level, and formalization at the organizational level. Memory functions, while somewhat less clearly distinguishable, are depicted as individual memory, transactive group memory, and organizational memory.

Following a discussion of earlier process models of organizational learning, the introduced components were then finally combined into a procedural framework of organizational learning and memory across levels of analysis. The different learning and memory functions were linked along a feed forward stream from individual cognition to organizational formalization, and through feedback loops from higher to lower levels of aggregation. The proposed framework serves as the theoretical conceptualization of organizational learning in the present thesis, and thereby guides the choice of methods for the empirical inquiry, and structures the data analysis.

2 RESISTANCE TO CHANGE

The second chapter introduces resistance to change, the second theoretical stream of this thesis. The following paragraphs first of all provide a detailed account of the study of resistance to change in various literatures. The aim is to first categorize objects, influences, agents involved, and forms of expression, in order to create an understanding of the dynamics of the construct. 'Overcoming resistance to change' as the dominant research paradigm in the past is then investigated, and fundamental shortcomings of this approach are identified. An alternative perspective in the form of a functional analysis of resistance is introduced that shifts attention to the effects of resistance rather than to its antecedents. Employing resistance as an independent variable allows for the merging of the two theoretical streams of this thesis, and finally for the formulation of a research question.

2.1 COMPONENTS OF RESISTANCE

As will be illustrated throughout the following sections, the research interests that are prevailing in the resistance domain are focused on controlling and managing resistance in organizational change. The concept is predominantly treated as a dependent variable. The resistance phenomenon is regarded as some kind of monolithic entity that emerges or not, and that is embedded in varying contexts and subject to diverse influences. Consequently, efforts are concentrated on manipulating the influential factors in order to either completely obstruct the emergence of resistance or minimize its supposedly detrimental consequences. The interest lies basically in fixing the issue.

Examining resistance in this form of a causal analysis, conceptual components can be classify into five different categories: Actor, object, conditions, manifestation and perspective (Bauer, 1993). The conceptualization involves single or multiple actors who interact with certain objects or events. This interaction lays the foundation for opposing interests and conflict of power relations and hence spawns resistance. Conditions that are internal or external to the focal organization shape the resistance, which itself is manifested in various forms or actions. Any examination of resistance implies a theory-in-use of resistance that is applied by a given observer. Such a theory creates a perspec-

tive that assigns certain values and justifications to the actors involved, and defines organizational events as either conditions or manifestations of resistance.

2.1.1 Actors

The traditional view of resistance is focused on the management/worker dyad and locates the actors of resistance unanimously in the lower tiers of the organizational hierarchy (Coch & French, 1948; Johns, 1973; Lawrence, 1954). Those who are supervised resist the power and oppression their supervisors inflict upon them. While such a view is well justified in the light of McGregor's Theory X (1960), which assumes that people are naturally untrustworthy, have little ability, and need to be kept under patronizing rule, modern organizations necessitate a more differentiated picture. Not only are working relations often less formal, with fewer strata of hierarchy to facilitate more flexible communication, but especially the introduction of modern information technology has altered power relations within organizations (Streicher, 1984). Recent trends in organizational change like Total Quality Management and Lean Production seem to involve all layers of the workforce (Wall & Jackson, 1995; Womack & Jones, 1996), with resistant tendencies being equally probable for a wide range of actors. LaNuez & Jermier (1994), for example, provide an illustrative outline of cases where managers have sufficient motive to exercise resistance by sabotaging the production of goods and services. Thus, the traditional subject pool of male blue-collar factory workers as the focus of resistance studies is too homogenous and outdated. All organizational members may be on the performing or receiving end of resistance to change.

2.1.2 Objects

Individuals resist a wide variety of organizational practices and policies and in principle any change intervention can be targeted. However, the image needs differentiation as to whether change per se is resisted, or specific kinds of changes, or dynamics accompanying the change process. It will be shown that these three aspects are somewhat intertwined.

As the concept of resistance to change has become a standard part of management vocabulary, there seems to be an underlying belief in an 'innate inertia' or 'innate conservatism' of human beings. Dent & Goldberg (1999a) heavily criticize this view in

their analysis of current management textbooks, pointing out that the phenomenon is treated overly as an individual level concept and has no empirical foundation. Interestingly, innate resistance is also not reconcilable with prominent and well-established theories of human needs and motives. In their theories of motivation Maslow (1954), Alderfer (1972) and McClelland (1985; McClelland & Boyatzis, 1982) understand motives such as self-actualization, growth, and achievement as basic needs of human beings, indicating that these motives are not based on fixed standards but tend towards structural change. The argument against innate resistance will be elaborated in the discussion of the 'overcoming resistance to change' paradigm.

Examining specific kinds of changes, a distinction can be made between technological and social change. Few changes are purely technological. Based on the assumption that technology per se is neutral (Pinch, 1996), it can be inferred that people do not resist any new technology but the social consequences that come with it (Bauer, 1993; Dent & Goldberg, 1999a; Lawrence, 1954). The influx of information technology, for example, has such diverse ramifications as the empowerment of IT departments, organizational restructuring, or the confinement of workspace. Thus, it is highly likely that not the change per se is resisted, but the dissolution of social groups, changes in the task structure, threats to social positions, job losses, changes and devaluation of skills, increased job demands etc.

Dynamics accompanying change interventions might also instill resistance amongst actors involved. Change agents such as external consultants can be a source of conflict not only because of their status as 'know-it-all' outsiders, but also because of the change agenda they are trying to impose or the interaction they are offering (Bertoin Antal & Krebsbach-Gnath, 2001; Kieser, 1998; Schmolze, 2000). Resistance may oppose process implications (Molinsky, 1999) or certain goals of the change process as well as the style of change management, such as the language used or the degree of participation (Boenisch, 1979). Accompanying change interventions are also in many cases actual or perceived measures of control and restrictions of freedom that trigger resistance. Considering restrictions and control, reactance seems to occur frequently as a motivation to restore or extend degrees of freedom (Gniech & Grabitz, 1978). As reactance often includes irrational aversive behavior, this might in turn generate the further tightening of control.

2.1.3 Conditions

In observing resistance as a dependent variable, conditions internal and external to an organization shape resistance in regards to the type of manifestation as well as the likelihood and strength of occurrence. Following Bauer's (1993) classification, three levels of situational conditions can be distinguished: Interactional, organizational and cultural conditions.

Interactional conditions pertain to situational factors at the individual level of action. Various psychological concepts located at the individual-organization nexus can be identified to be a possible source of influence on resistance (see George & Jones, 2001, for a suggestion of a process model of individual change in organizations). The idea of an unwritten psychological contract between the individual and the organization proclaims an implicit agreement about the costs and benefits of work relations (Levinson, Price, Murden, Mandl, & Solley, 1962; Rousseau, 1989). Resistance can arise either as a consequence or be amplified as a function of violations to such contracts. Strebel (1996) includes this idea in his concept of personal compacts, comprising psychological assumptions as well as formal agreements (e.g., contracts and job descriptions) and social aspects (e.g., perceptions about an organization's culture). The relationship between costs and benefits is also a central part of equity theory (Adams, 1965). According to equity theory, individuals compare their own ratio between personal input and outcome to those of other organizational members, and identify congruence or disparity as an indicator of perceived fairness and justice, or lack thereof. Resistance is justified if input-outcome ratios are seen as unequal. The quality of the relationship between individual and organization is also conceptualized under such labels and indicators as organizational citizenship behavior (Organ, 1988), personal commitment (Hulin, 1991; Meyer & Allen, 1997) and turnover (Mobley, Griffeth, Hand, & Meglino, 1979; Mueller & Price, 1989). If there is little citizenship behavior, a low degree of commitment and a high turnover rate, barriers and inhibitions to engage in resistance are likely to be low (although this might depend on what the specific change entails).

Psychological traits and demographic variables are additional conditioning variables at the individual level. However, the application of these factors to the analysis of resistance is obscured for several reasons. Since the expression of resistance in an organization is seldom confined to single individuals, but is most often a more or less col-

lective act, singling out individual traits is problematic. Moreover, traits that could be held responsible (e.g., neuroticism, anxiety) are negatively loaded and associate a certain pathology with the resisting individual, thereby prematurely evaluating the process (Bauer, 1993). In addition, Clegg (1994) relates the individual subjectivity that determines the process of resistance to specific power relations and location related traditions, not to intrinsic characteristics of the concerned subjects.

Organizational conditions include power relations of member groups, structural aspects, and strategic choices. Political activity within organizations and across boundaries is likely to result in vested interests among actors involved in change processes (Drory & Romm, 1990). Dominant groups exercise influence to shape change interventions according to their own agenda. On the one hand, such vested interests are affected by individual level conditions as described above. On the other hand, the dominance of interest groups is a function of the way they are embedded in organizational structure. The more centralized, the more pivotal to core processes, the deeper stratified, the less exposed to norms of equality and the smaller the crisis faced, the more successful dominant groups will be in expressing resistance.

Structural aspects pertain to the formal and informal design of organizations. It is widely believed that bureaucratic organizations have difficulties in adapting to environmental changes due to their rigid structure and formalized and inflexible lines of decision making (McKenna & Wright, 1992). Following that rationale, bureaucratic organizations are resistant to change primarily by means of their structure as a whole, not because of their members. Thus, just as there might be organizational structures prone to learning, there seem to be organizational structures prone to resistance.

Informal structures of communication and behavior transgress formal boundaries. Although they have no official leader and are not formally recognized, it should not be assumed that their actions are uncoordinated or irrelevant (Guzzo & Shea, 1992), and they should not be ignored in change efforts (Lawrence, 1954). Internal communities can be a resource for any transition (Brown & Duguid, 1991; Kofman & Senge, 1993), but they need to be deliberately utilized in order to take advantage of their decisive capacities.

A further organizational condition is the strategic goals that are pursued. In the production of goods and services, an organization can either exploit existing capabilities or explore new terrain. In the relevant discussion of this trade-off in the chapters on or-

ganizational learning, it was pointed out that exploitation strategies usually generate proximate and predictable returns on allocated resources, while exploration efforts demand longer time horizons and more diffuse effects (March, 1991). Therefore, resistance to change can be a product of past excesses of exploitation, rendering the organization unable to engage in novel initiatives.

Employing a macro-level perspective, there are also cultural conditions that shape resistance. These conditions relate to the way an organization is embedded in a particular society, not to internal organizational culture. Applying the connotations of bureaucracies to entire societies, it should be expected that in the classic comparison between capitalism and communism, capitalistic societies are generally less resistant to change because of their exposure to market forces and internal competition (Porter, 1998). Democratic societies traditionally organize their labor force into trade unions that represent workers' interests opposite employers and government agencies. The history of such industrial relations will play a role in how change efforts from either side are perceived. Moreover, explanations of resistant societies often center on histories of oppression and conquest by which a 'will to resist' becomes engrained across generations (Hutchinson & Smith, 2000). Stronger resistance could also be expected in societies that subscribe to such descriptions as traditional, stoic, and immobile (Beals, Hoijer, & Beals, 1977).

2.1.4 Manifestations

Given the multitude of influences arising from a great diversity of possible actors, objects, and conditions, it should be clear that expressions of resistance are equally manifold and multifaceted. Sticking to the established subject pool of blue-collar shop floor workers, traditional notions of resistance focus on overt, clearly visible and intentional, collective actions such as workplace revolts, formal petitions, sabotage, property damage, and output restrictions (Edwards & Scullion, 1982). However, this view has distinct limitations.

Elaborating on the intricacies of power relations in organizations, Jermier, Knights, & Nord's (1994b) collection of case studies provide the ground for the argument that the nature of resistance will vary across space and time, and is likely to be expressed in a multitude of mundane actions and behaviors at the workplace. For example, Prasad & Prasad (2000) describe three discursive practices expressed during the com-

puterization of a health maintenance organization, which they identify as routine resistance. Employees constructed certain actions of theirs in hindsight as being deliberately antagonistic or resistant. A flooding event, causing considerable damage to stored electronic devices, was later communicated among employees as a purposeful act of sabotage. Another form of routine resistance involved managers interpreting certain employee actions as disruptive, even though the managers simultaneously acknowledged that these actions were not necessarily intended to be so by those who engaged in them. The authors conclude that their examples confirm the presence of resistance at an informal and discursive level, expanding the image of resistance as a conscious, calculated act. A further example by Scott (1987), set in a completely different context, describes the creativity of Malay peasantry in circumventing the payment of a specific form of tax sentence; an instance of passive resistance without formalized protest and organization.

The consideration of attitudes in manifestations of resistance adds the role of affective elements in the change process. Research on attitudes reveals a tripartite structure consisting of an affective, cognitive, and behavioral component (Eagly & Chaiken, 1993). Advocating a multidimensional view of attitudes toward change, Piderit (2000) cautions that responses to change should not be classified using the rigid dichotomy of resistance vs. non-resistance, but should rather be assessed on continua for different attitudinal components. In sum, resistance can also be assumed to be constituted by cognitive, affective, and behavioral components, and is manifested in an abundance of forms.

Attempts at classifying manifestations of resistance struggle to make clear distinctions between designated categories. The most notable problems arise in differentiating between formal and informal resistance. Prasad & Prasad (1998) distinguish formal, collective, and intentionally disruptive activities from less visible and more indirect forms of opposition that can take place within the everyday worlds of organizations. Based on an earlier discussion by Scott (1985) they use the term 'routine resistance' to describe "mundane and almost ordinary actions of workplace actors, which are nonetheless capable of being interpreted as resistant" (p. 227). As a consequence of such broad interpretations, depictions of resistance become increasingly inclusive and subjective to the perspectives of observers.

> "The central point being made here is that one cannot automatically infer that resistance is taking place on the basis of a specific type of action (e.g., horse-

> play, gossip, aberrant dress style, etc.) occurring in the workplace. [...] Identifying routine resistance becomes further complicated because it is often difficult to specify where compliance ends and where resistance begins. [...] What we are now confronted with is the possibility that seemingly subversive or disruptive practices are not necessarily resistant by intent, while ostensibly compliant ones may well contain seeds of resistance and opposition." (Prasad & Prasad, 2000, pp. 388-389, parentheses in original)

A first step towards alleviating problems of recognition and categorization should be to note that there is a difference between opposition and resistance, namely that opposition is institutionalized and resistance is not. Trade unions, for example, are to a large extent institutionalized forms of opposition. Resistance therefore will always be connected to some sort of initial spontaneity or ad hoc action. While Prasad & Prasad (1998; and to a lesser degree 2000) fail to make this distinction, they acknowledge that a more formal definition of routine resistance is somehow deliberately evaded in the literature. Routine resistance is mostly defined as something that is *not* conventional resistance, in order to keep the notion flexible and open. Utilizing the framework of social interactionism, the authors eventually propose a research trajectory that does not reify routine resistance as a pre-specified set of actions, but instead looks at how routine resistance is constituted in local workplace situations (Prasad & Prasad, 2000).

If resistance is thought to be influenced and shaped by multiple situational factors such as actors, objects, and conditions described above, Prasad & Prasad's advice not to limit the concept to pre-specified features seems convincing. With all due cautions not to fall prey to overly inclusive interpretations while doing research on the phenomenon, subjects' creativity in expressing routine resistance should be considered. Nevertheless, despite the problem of blurred boundaries, generic forms of resistance can be identified. *Table 2.1* shows a categorization according to the dichotomies individual-collective and active-passive (Bauer, 1993). The categories are complemented by examples from Prasad & Prasad (1998, examples too specific to particular settings are omitted).

2.1.5 Perspectives

Finally there is a meta-level in the analysis of resistance, namely the perspective that can be employed to observe the phenomenon. The perspective implies certain attributions and connotations for the actors involved. A basic differentiation can be made between the form of 'observing the other' and the form of 'self-observation' (Bauer, 1993). 'Observing the other' pertains mostly to the viewpoint of external actors who are

involved in a change process as change agents, investigating theorists or innocent bystanders. This seems to be the dominant perspective, as resistance in an organizational context has mainly negative connotations and is thus rarely used for self-observation. However, the organizational strategic agenda plays a role in interpreting the observations of others. If change is wanted, inactivity is construed as resistance. If stability is the objective, inactivity will be understood as commitment.

Table 2.1: Manifestations of resistance

	Active	Passive
Individual	Reduced performance levels Criticism of management Grievances Sabotage Aggressions Refusal of (additional) work load	Rationalizing refusals Apparent acceptance, later return to old ways Wishful thinking Refusal to use new facilities Laughter, irony, pleasure about system failures Humor and jokes about management Anger, nervousness Critical comparison with other systems/organizations Sticking to old ways of doing Indifference and waiting Careful carelessness Extension of breaks Non-participation in company rituals/traditions
Collective	Collective protest and/or strike High fluctuation of staff Absenteeism Reduced output in quantity and quality (output restrictions) Work to rule Destruction of means of production Occupation of factory Forming of groups	Negative attitudes, low acceptance Sticking to old ways of doing Horseplay leading to product damage Gossip

Resistance as a prominent concept in management thinking is also attractive because it has news value as bad news about business activities (Lorsch, 1976). In the observation of others, bad news can be exploited and instrumentalized according to given political and managerial agendas.

From a more remote viewpoint, perspective stands for the theoretical worldviews about the nature of work, organizations, and resistance itself. Using the term worldview, the dogmatic aspects of some perspectives are indicated, which may reach far beyond the focal topic of resistance to unique fundamental understandings of his-

tory, society, and science. Jermier, Knights, & Nord (1994a) illustrate as examples the arguments of three influential labor process analysts, Karl Marx, Harry Braverman, and Michel Foucault. Prasad & Prasad (1998) classify the additional perspectives of neo-Marxism, critical cultural studies, feminism, interpretive studies, and post-colonialism. Since an even remotely adequate description of the underlying arguments of each of these viewpoints goes far beyond the scope of this paper, only an account of the various 'brand names' will be provided here. Interested readers are encouraged to explore the collections mentioned above.

In sum, it should be noted that any analysis of resistance to change needs to explicate its inherent perspective, both in terms of its standpoint of observation and its theoretical background. As will be shown in the following paragraphs, the awareness of underlying perspectives and agendas in the study of resistance is a great support in uncovering limited conceptualizations and premature assumptions.

2.2 OVERCOMING RESISTANCE TO CHANGE

The influence of the 'observing the other' perspective is nowhere more clearly detectable than in the research paradigm that dominated studies on resistance for most of the last 50 years: *Overcoming resistance to change* (see the eponymous study below). Suggestions on how to deal with resistance to change have evolved over time, from Taylor's (1911) proposition to steam-roll resistance to more moderate and attentive strategies. But the notion of resistance as a nuisance that needs to be overcome, a stubborn natural tendency of 'others' involved in a change process, appears to be conventional wisdom in especially the management literature (Dent & Goldberg, 1999a). A brief overview of the advent of this viewpoint and its further development will be provided.

2.2.1 Coch & French

The most influential text that should probably be understood as the point of origin of this mindset carries its title as an programmatic outlook: 'Overcoming resistance to

change' by Lester Coch and John French (1948). This often cited work[11] is based on a study conducted at the Harwood Manufacturing Company, a pajama factory in Virginia, USA. The company employed workers at piece rate and experienced significant and persistent declines in group production rates once a new technology was introduced. In this exemplary treatment of resistance as a dependent variable, two initial questions are asked: (1) "Why do people resist change so strongly?" and (2) "What can be done to overcome this resistance?" (p. 512). Applying Lewin's field theory to local circumstances, the basic experiment consists of three experimental groups and one control group. All four groups were subject to job changes that would necessitate the acquisition of new skills and that would entail initial reductions in productivity (and pay). While the control group went through a lecture-style non-participatory group meeting to introduce the changes, the experimental groups were exposed to varying degrees of participation in decision-making. This was either indirect participation with elected representatives talking to management or direct participation in the decisions of how to introduce a new technology. The results are indicated by means of differential recovery rates of the learning (i.e., productivity) curves after the introduction of the changes. The production rates of all groups plummeted immediately after the changes occurred. However, while the performance of the control group never recovered to the level before the changes, performance of the experimental groups soon reached their before-change level and went beyond that. Productivity in the experimental groups not only rose faster, but the speed of recovery and the average post-change level of productivity were directly proportional to the amount of participation experienced. Moreover, turnover in the experimental groups was lower than in the control groups. In a second experiment, a part of the original control group was given a direct participation treatment, which resulted in fast recovery and a final level of production above the level before transfer. In sum, the results indicate a direct relationship between participation and resistance: The higher the degree of participation, the lower resistance to change. Coch & French conclude that participation in decision-making as a management method reduces and modifies the forces of resistance.

The results of the study are compelling and, embedded in Kurt Lewin's theories and backed by the very influential Research Center for Group Dynamics, were dissemi-

[11] According to the Social Science Citation Index, Coch & French's article has been cited 569 times in scientific journals alone between 1981 (the inception of the computerized citation index) and June 2004.

nated to a wide academic and corporate audience. Together with the Hawthorne experiments (Roethlisberger, 1989), Coch & French paved the way for the Human Relations approach to management and established employee participation as a means to not only humanize general working conditions (Follett, 1982), but also to increase economic competitiveness (Froehlich & Pekruhl, 1996).

Despite all apparently positive ramifications, Coch & French's study suffers from serious methodological flaws and must be questioned for its relevance to the concept of resistance. Gardner (1977) and later Bartlem & Locke (1981) scrutinize the original interpretations and identify doubtless shortcomings that question the study's internal and external validity. Amongst the faults are the selection of only female subjects, no random selection and random assignment to experimental groups, unequal job changes, unequal group sizes, dramatic presentation of the necessity of changes only to the experimental group, confounding inter-group competition, motivational effects due to perceived prior punishment, and a general inattentiveness to cognitive effects. As a result, both authors find it impossible to infer that the increased productivity in the experimental groups occurred solely due to participation in decision-making. Attempts to replicate Coch & French's findings with stricter control of confounding variables either failed to find performance differences (French, Israel, & As, 1960) or had to restrict the context under which the results are valid (Fleishman, 1965).

Dent & Goldberg (1999a) also question the relevance of Coch & French's study to the concept of resistance by saying that the original experiments are really more about employee participation than anything else (p. 32). As the term resistance is not used in the original study (only in the title) and the focus shifts between individual consequences of change and meta-level systemic field forces, the title choice of the article appears surprising. Frames of reference are provided that guide Coch & French's thinking, but the main cause behind embedding their research in the 'overcoming resistance' frame is probably their close relationship to the theories of Kurt Lewin[12]. As will be elaborated in the next chapter, Lewin's theorizing coined the term resistance to change as a concept pertaining to social systems.

[12] Coch and French were both employed at the time of the experiment at the Harwood plant by its owner, Alfred J. Marrow, who had met Lewin as a doctoral student and later collaborated with him (Marrow, 1969; Marrow, Bowers, & Seashore, 1967). Coch, French, and Marrow were all active at the Research Center for Group Dynamics, which was founded by Lewin.

2.2.2 The persistence of overcoming

Above and beyond the initially persuasive message of its results, basic parameters of Coch & French's study were an influential source of inspiration for management thinking for years to come. Treating resistance as a dependent variable, employing an 'observing the others' perspective, exclusively understanding lower levels of hierarchy as obstacles to change processes and adopting the principle that management can 'fix the problem' of resistance all culminate in the basic assumption that *people resist change* (see Zander, 1950, for an early example). Contemporary textbooks in the fields of management, organizational behavior, and organizational psychology support this view, and more or less perpetuate its connotations (e.g., Frese, 1998, pp. 664-665; Huczynski & Buchanan, 2001, pp. 599-604; Mullins, 1999, pp. 823-826; Robbins, 2001, pp. 545-550).

Employee participation is one management answer to resistance. But since the nature of change can be multifaceted, the types of responses to the resistance that is caused by change should vary accordingly. The thinking of contingency theorists was introduced to this context by Kotter & Schlesinger (1979). In their prominent article, the authors describe various causes for resistance to change and then outline several approaches to dealing with it. Their account of common reasons for resistance includes parochial self-interest, misunderstanding and lack of trust, different assessments, and low tolerance for change. It must be noted that these reasons relate only to the employees upon which the change is imposed. Kotter & Schlesinger write from a perspective that implicitly allocates management the role of directing change, not taking part itself. A possible inability of managers themselves to change is mentioned only briefly (p. 109). The idea of employee participation is integrated into the proposed six strategies of alleviating the problem, that is, overcoming resistance: Education and communication, participation and involvement, facilitation and support, negotiation and agreement, manipulation and co-optation, and explicit and implicit coercion. According to certain situational factors, the organization in question can be located on a strategic continuum and the most adequate of the six methods can be applied.

The appeal of reducing a virtually infinite number of influences (as stated on p. 109) to a convenient set of variables may explain the success of Kotter & Schlesinger. Their recommendations for action, however, reach far beyond a mere mitigation of re-

sistance. As in part indicated above, employee participation aims at humanizing work, decreasing hierarchical differences and creating upward communication. It seems to be crassly ignorant to misuse this way of managing as a simple tool of persuasion. Moreover, coercing people into unwanted changes might underestimate power relations and have consequences far beyond overcoming immediate resistance (Schmolze, 2000).

Upholding Coch & French's (1948) basic parameters, Kotter & Schlesinger add the notion of contingent responses. The influence of their approach spawned numerous management cookbooks on how to seduce employees into accepting change efforts (e.g., Hultman, 1998). The underlying theme draws a picture of management working against employees. As Piderit (2000, p. 784) puts it, "managers are tempted by the language of resistance to treat their subordinates as obstacles". Instead of using a logic of attracting people to follow them, most top managers seem to believe that change is something that someone with authority does to someone who does not have authority (Quinn, 1996; Weick & Quinn, 1999).

2.2.3 Changing perspectives

The treatment of resistance as something essentially pathological, in combination with the assumption that resistance is a natural reaction to change, has conflicting consequences. If change is ubiquitous, any transformation adheres to the logic of an intrinsic pathology. The emphasis on 'overcoming' perpetuates the conceptualization of resistance as a dependent variable and allocates all efforts of alleviation to the change part of the change-resistance dyad. If resistance is to be expected anyway, why not pay more attention to its nature and outcomes in order to gain a more complete image?

Nord & Jermier (1994) apply Carl Gustav Jung's metaphor of the Shadow (Jung, 1976), originally referred to as parts of an individual's personality that he or she refuses to accept, to the 'overcoming' paradigm. They state that by overemphasizing the notion of overcoming resistance to change, important aspects of the resistance concept might be pushed into the Shadow, that is, they are refused further exploration. As a consequence, resistance is undesirable and change is desirable. Employing an analogy to psychotherapy, resistance needs to be overcome not because it helps the resister (as in

therapeutic sessions), but because it is an obstacle to someone else's objectives (e.g., management). Thus, resistance is something to be resisted (p. 399).

A shift of focus away from allegedly innate characteristics of individuals is undertaken by Kotter (1995; 1996). Referring to his chosen title, he asks the initial question whether change is something one manages or something one leads? Managing something implies telling people what to do, while leading something involves showing people how to be. Therefore, change initiators cannot be excluded from the change itself. While acknowledging that resistance might be within the individual, Kotter states that such resistance is rare and situates resisting forces somewhat outside the individual, within structural and systemic factors. These obstacles include, amongst others, adverse performance appraisal systems fueling self-interest, insufficient communication channels, narrow job categories, and not achieving enough critical mass for the change-guiding coalition. If such obstacles in the total system are removed, a large part of the expected resistance will not be encountered.

Taking Kotter's interpretation further, Dent & Goldberg (1999a) make a vigorous argument against the apparent conventional wisdom that people resist change. They suggest an enhancement to the general discussion by saying that people do not resist change per se, but people resist loss. Loss of status, loss of pay, loss of influence, loss of freedom, loss of comfort etc. (as discussed in the subchapter on objects of resistance). By assuming that resistance is a given irrespective of the consequences of change, most transformation efforts are bound to fail because of this fundamentally flawed mental model (p. 26-27). Resistance turns into a self-fulfilling prophecy: Change initiators plan on its occurrence, undertake any attempt to minimize it in advance, are tempted to disguise or hide the change, and such going to any lengths will give birth to the phenomenon that was supposed to be avoided in the first place (Winslow, 1992, as cited in Dent & Goldberg, 1999). In sum, Dent & Goldberg advocate abandoning a perspective that is overly centered on the individual and ultimately call for a retirement of the phrase 'resistance to change'.

Looking at resistance through the eyes of prevalent change initiators, namely external consultants, Merron (1993) detects the same deficient mental models and frameworks as described above. In addition to also denouncing the phrase 'resistance to

change', he notes that employees might "not be resistant to change at all, but expressing differing views of what is truth and differing views of the kind of organization they want to be in" (p. 83).

This indicates that there might be something more to resistance than simple, unspecified opposition. In combination with Dent & Goldberg's (1999a) argument that people resist for very specific reasons that are contingent on various situational factors, a shift in analysis can be pursued. Change is a very broad term and it comes in a plethora of different shapes and sizes. And so does resistance, as could be seen in the discussion of its manifestations. Any simplistic attempt to remedy employee opposition by offering a handful of generic sets of action, regardless of the originally intended change, fails to recognize the inherent complexity of the phenomenon. In the paragraphs on objects of resistance, it was shown that the idea of innate resistance to change is not compatible with prominent theories of motivation. One can think of innumerous occasions where people actively seek and welcome changes, such as changes to dissatisfying situations, interesting learning challenges, or stimulating enrichments to the environment (Dent & Goldberg, 1999b). But when resistance does occur, an explicit analysis of this very occurrence might produce the benefit of a clarification of the overall change process. Resistance has a *diagnostic* function.

> "Researchers have largely overlooked the potential positive intentions that may motivate negative responses to change. [...] Hence, what some may perceive as disrespectful or unfound opposition might also be motivated by individuals' ethical principles or their desire to protect the organization's best interests." (Piderit, 2000, p. 783 and p. 785)

Bringing resistance into the light of thorough analysis reveals its diagnostic functions and raises awareness for a productive use of conflict, instead of its avoidance or suppression (De Dreu, 1997). For example, a constructive use of controversy is characterized by full exploration of opposing opinions and frank analyses of task-related issues (Tjosvold, 1998; Tjosvold, Wedley, & Field, 1986).

A detailed exploration of the described shift of focus, its connotations and consequences is provided in the following chapter.

2.3 TOWARD A FUNCTIONAL ANALYSIS

In discussing resistance, the implication of conflict holds the danger of assigning blame to one of the parties involved. However, a scholarly analysis should neither

blame management for autocratically forcing people into unwanted changes nor blame subordinates for selfishly opposing necessary transitions. As it can be hard to avoid a biased-sounding undertone, abandoning the notion of overcoming resistance to change greatly improves the objectivity of the analysis. A neutral standpoint will aid in uncovering the 'full potential' of resistance.

The move away from the 'overcoming' paradigm describes a less direct path. In order to formulate a consistent argument, different streams of theorizing about change and social systems need to be taken into account. All have their own shortcomings but contribute to my eventual attempt to conceptualize a functional understanding of resistance to change.

2.3.1 Kurt Lewin

A discussion of resistance would not be complete without the works of Kurt Lewin, probably the single most influential writer in management science on the topic of change. His approach is rooted in his field theory of social forces and provides a popular framework for the analysis of resistance. While it is by no means attempted to comprehensively delineate Lewin's powerful theorizing here, a few important concepts warrant clarification of his influence on the field.

Lewin (1947a; 1947b; also in Marrow, 1969) applies a systems perspective to the dynamics of change. Systems of social roles, with their associated patterns of attitudes, expectations and behavior norms dynamically maintain steady-state conditions through a process of homeostasis. This infers that social fields, representations of the group and its setting, are able to sustain stable conditions despite conflicting forces in the form of inhibitors or motivators. At any time, a social field will be exposed to the dynamics of forces opposite in direction. Understood as vectors, these forces might not originally be equal in strength, but will eventually level off at a point where this is the case, so that $f_{A,g} + f_{A,s} = 0$ is given[13].

Hence, social parameters like group performance, leadership, discrimination and hostility can be conceptualized as *quasi-stationary equilibria* of a social force field.

[13] Lewin's original notation is used here, where $f_{A,g}$ means a force acting on entity A in the direction toward g. $|f_{A,g}|$ indicates the strength of the force $f_{A,g}$. A trained physicist, Lewin uses an explicitly mathematical language in his description of social and psychological concepts.

Forces are continuously acting on the field but find a point of equilibrium for the inherent parameters as long as none of the opposing forces increase or decrease in strength. The social state at a given point in time can maintain its stability in spite of essentially dynamic forces, much like a river that continuously changes its elements although its velocity and directions remain the same (Lewin, 1947a, p. 15). Changing the equilibrium to a different level necessitates a change in forces, as implied by the above equation, so that $|f_{A,g}| > |f_{A,s}|$. This implies two different strategies for social change, either to increase motivating forces or to decrease resisting forces.

Relating his theorizing to force fields within groups and organizations, successful change requires three phases of action: Unfreezing, moving, and refreezing. First, the social state of a given force field needs to be unfrozen in order to disturb the equilibrium and increase the fluidity of a given situation. This can be done by identifying channels of communication and decision makers (i.e., gate keepers) and involving them in restructuring efforts (Lewin, 1947b). Second, in a period of disturbance, the equilibrium is moved to a different level by either increasing the forces for change or decreasing resistant forces. Lewin notes that the latter change produces longer lasting effects, as the former strategy results in high tension in the system. Third, in order to stabilize the change, the system is refrozen in a period of consolidation to a new steady state. Due to homeostatic effects, parts of the force field might return to their prior status quo, which is avoided by refreezing.

It can be concluded from the conceptualization of social fields that change and constancy are relative concepts, and so is resistance to change. Groups and organizations are constantly exposed to innumerous influences and continuously adapt their steady state to the resulting field forces. For example, a work group that achieves a certain production level might be subject to two different experiences. In one case, management sets higher production goals, in another a member of the group becomes ill. In the first case, resistance can manifest itself in refusal to work more, in the second case, resistance might be constituted by refusal to let the production level drop. Field theory explains both cases as resistance to change of the productivity equilibrium. Depending on the perspective, resistance and constancy are interchangeable, and both pertain to the dynamics of a social system.

Lewin's concepts have been tremendously durable over time and still exert influence on contemporary theorizing. The striking simplicity of the tripartite change con-

cept probably accounts for its popularity, and some authors even go so far as to declare that the whole theory of change is reducible to this one idea (Hendry, 1996, p. 624). His approach has been applied to a number of studies on resistance (Coch & French, 1948; Frank, 1944; Lewin, 1943), of which Bauer (1993) provides a detailed overview. Research on resistance in adjacent psychological fields still heavily relies on Lewin's findings, for example the idea of undermining counterforces in studies on persuasion (Knowles, Butler, & Linn, 2001; "The Economist", 2002).

Examining Lewin's works, it becomes apparent that he understood resistance as a systems concept. Although the psychology of individuals in the system is an element of the total system, resistance to change is not a psychological phenomenon (Dent & Goldberg, 1999a). Due to the system's homeostatic nature, the predominantly negative or compensating feedback loops always drive the system back to equilibrium. Thus, *systems* lack an inherent capacity for change, *not individuals*. This is not compatible with the dominant view of management theory, that is, the individual that must overcome resistance.

Prescribing external pressures to change a system holds, however, problematic connotations. Even the more moderate strategy of undermining counterforces employs a battlefield analogy that obviates a true consideration of possibly legitimate reasons for resistance. While Lewin himself seems to be technocratic in his theorizing[14], interpretations of field theory in real world settings support an underlying theme of resistance as a motivation problem that can be fixed by management. Field theory as a systems concept circumvents individual-level concerns, but fuels the managerial 'overcoming' paradigm by highlighting the susceptibility of social systems to manipulation. Describing social forces with mathematical formalizations promotes a view of solutions to conflict as a zero-sum game. Only one side can win, no joint benefit is possible (Bauer, 1993). As such, the productive potential of resistance is ignored.

2.3.2 The signal function of resistance

Probably the first management scholar to detect the shortcomings of the 'overcoming' paradigm, at least the first one with a large enough audience to make an im-

[14] "The practical task of social management, as well as the scientific task of understanding the dynamics of group life, require insight into the desire for and resistance to, specific change." (Lewin, 1947a, p. 14)

pact, was Paul Lawrence (1954). His article in the Harvard Business Review asks the question of how to *deal* with resistance, and the basic proposition is that there are two kinds of change, technical change and social change. People do not resist technical change as such, but they might resist its social ramifications. Lawrence identifies as the core of the problem the ignorance of technical specialists to the effects of new technologies on human relationships in the organization. Moreover, technical specialists often do not recognize production employees as being specialists in their own rights. A number of management actions are offered to influence attitudes of staff, presumably the most important of which is taking a new look at resistance. Drawing on the self-fulfilling prophecy problem, supervisors are advocated not to generally expect people to resist change. Instead, Lawrence recommends paying careful attention to occurrences of resistance, which culminates in the following seminal quote:

> "When resistance *does* appear, it should not be thought of as something to be *overcome*. Instead, it can best be thought of as a useful red flag – a signal that something is going wrong." (Lawrence, 1954, p. 56)

Thus, Lawrence acknowledges the potential value of resistance as an informative feedback loop for the change agency. Resistance has a signal function, which clearly adds a prescriptive, functionalist dimension to the concept. The implication for change agents is to reverse their attitude about resistance to change and utilize it rather than fight it.

2.3.3 An analogy to acute pain

Lawrence's quote shown above is followed in his original article by an analogy to pain. As a signal that something is going wrong, acute pain to the body may fulfill the same useful function as resistance to the organization. The idea that resistance to change might be a functional phenomenon has been hinted at again by Klein (1969), but only receives full attention and theoretical elaboration in Bauer (1993; 1995b).

The same way an analogy to individual learning is used in the discussion of organizational learning, using an analogy to acute pain in the resistance discussion can provide significant insights about the mechanisms that produce observable phenomena. Knowledge from one domain (the base domain) is transferred to the domain to be explained (the target domain). Thus, in analogical reasoning an explanatory structure of

relationships from a source domain can be transferred to a target domain. The system of relations among the base objects is essentially the same for the target objects, and an analogy is a way of focusing on relational commonalities independent of the objects in which those relations are embedded (Gentner, 1983, 1989).

An analogy to pain on the level of individual action will be helpful to examine resistance on the level of collective activity. It is important to note that this analogy does not refer to dysfunctional chronic pain, but to acute pain in reaction to internal or external strain or injury. An experience of acute pain in the human organism follows a cycle of events (Wall, 1999): Attention is focused internally, the body image and reflective activity is enhanced, the current state is evaluated and the course of action is altered. As a fifth function before any alteration, pain usually puts a delay to ongoing activity. Through its function of enhancing internal attention and reflective activity, resistance, like pain, has the diagnostic function of indicating the location of a problem. Used pragmatically, resistance, like pain, urges the system to change its intended course. The system would otherwise endanger its own health (Bauer, 1995b). There is a clear action implication. A system that has no capacity to experience pain will cease to exist for failure of recognizing threats to survival. Resistance can therefore be understood as 'collective pain', contradicting the traditional dysfunctional connotations.

Furthering the notion of resistance as collective pain, resistance has also been characterized as a survival mechanism. Goldstein (1989) proposes this idea in the context of describing resistance as a mechanism of autopoiesis. The theory of autopoiesis was originally meant for understanding cell reproduction, but has gradually evolved into a general theory of systems. The theory proposes that the components of an autopoietic system are used to produce new components and their internal relations, while the production of components does not depend on an input-output relation with the system's environment (von Krogh, Roos, & Slocum, 1994). This latter aspect indicates the contrast between autopoietic theory and Katz & Kahn's (1978) open system's theory of organizations. Autopoietic systems are autonomous and self-maintaining unities that contain component-producing processes. The components, through their interaction, produce the same network of processes that produced them. Autopoietic systems are operationally closed, and hence are not seeking to maintain equilibrium of incoming and outgoing forces, but instead preserve their steady state through self-organization

(Luhmann, 1984). Any kind of change presents a threat to this internal organization and is naturally resisted. Goldstein (1989) transfers this concept to organizations and explores resistance to change as an innate survival mechanism. According to his ideas, the organizational system must be moved to a far-from-equilibrium state, through energy exchange with the environment, in order to bring about changes. Moving the system toward such a state is made easier if efforts are informed by attention to the specific types of resistance that are encountered. Concluding on Goldstein's perception of resistance as a natural tendency, the systems perspective of this approach has to be emphasized. Organizations as autopoietic systems resist change, not single individuals within these organizations. Moreover, this approach supports the idea of resistance in organizations as collective pain, which forces a system to follow the sequence of events described above, namely internal focus, reflection of ongoing activity, evaluation, and alteration of the course of action.

2.3.4 Pain awareness

Further attention to the pain phenomenon reveals a crucial aspect that links an experience of pain to the consequential sequence of events described above: Pain needs to be felt. More precisely, there needs to be awareness of pain in order to enable its functionality as a trigger for action.

Wall (1999) describes pain as the awareness of a need state rather than an isolated sensation. Pain promotes healing rather than helps in avoiding injury. Hence, pain is more of a motivation than a physical sensation, and there is only a loose link between injury or damage and pain. The distinction between nociceptive stimulus sensation and subsequent awareness, denoting an appropriate action implication, is counterintuitive but crucial (Grahek, 2001)[15]. There is pain without injury and injury without pain. For example, individuals with certain pathological conditions, such as pain asymbolia, feel pain upon harmful stimulation, but this does not in any way represent for them a sign of danger or threat. Conversely, there might be awareness of pain without the presence of an actual stimulus, as in phantom limb pain, or without the actual physical capability for

[15] Grahek's (2001) elaborations illustrate that the complexity of the pain phenomenon far exceeds a simple stimulus-response model. For the present purpose, the important, albeit simplified, distinction is made between pain and awareness, while recognizing that this glosses over some intricate details. Such details, however, are more relevant to a medical context and go beyond the scope of the present study.

pain sensation, as in specific cases of congenital or acquired analgesia. Pain awareness also has a recursive feedback function, through which sensation may be modulated.

In addition to medical conditions, certain sensations or influences are sometimes powerful enough to attenuate pain awareness. In endurance sports or in combat, for example, the body's production of hormones such as endorphin or adrenalin helps to sustain performance levels despite continuous pain sensation. Extreme excitement, anger, or fear may induce a reduction in pain awareness.

The activation of both pain sensation and awareness requires a certain minimal induction. A minimum threshold needs to be exceeded for a noxious stimulus to result in pain sensation, and for pain sensation to result in pain awareness. Such thresholds vary according to individual experience and circumstance as well as intensity and duration of prior exposure to noxious stimulation or pain sensation. Pain awareness also fulfills a feedback function

Returning to the analogy between acute pain in individuals and resistance to change in organizations, the recognition of the role of awareness has some connotations. According to the pain analogy, in order to trigger the depicted cycle of events, any emergence of resistance would first need to be acknowledged as such. More precisely, resistance would need to be both noticed and recognized as resistance. Hence, especially in large organizations, the signal value of resistant behavior by some organizational members would require a minimum strength and clarity in order to be noticed by other members, and in order to generate more than locally confined awareness. The magnitude of each threshold will depend on the given circumstances. Due to the feedback function of awareness, a dynamic relationship between the phenomenon and its awareness are expected.

In sum, the pain analogy suggests that resistance to change must cause organization-wide awareness in order to trigger a sequence of internal focus of attention, reflection and evaluation of current activity, and alteration of action.

2.3.5 A shift from causes to effects

The analogy to acute pain clarifies the concept of resistance as a resource in the change process. Lewinian field theory understands resistance as a counterforce to change and assigns it a basically dysfunctional status. The focus of attention are the

forces that influence and shape resistance. Through the pain analogy, a shift of attention toward the effects of resistance is prescribed.

The effects of pain on the individual level have been explained. Pain fulfills a (negative) feedback role to the ongoing activity. Embedded in individual action theory (Frese & Zapf, 1994), feedback follows the action sequence of goal development, orientation, plan generation, decision, and execution-monitoring. Feedback can only be interpreted with reference to a goal. While action theory concentrates on the individual, the theory of self-active systems provides a framework for both individual and group/organizational behavior (von Cranach et al., 1986).

Bauer (1991; 1993) proposes this as an adequate theoretical framework and elaborates on its implications for the analysis of resistance. A view of social organizations as self-active systems manifests that organizations are acting entities whose behaviors are steered, controlled, and energetized by internal communication. Coordinated group actions, based on individual behavior, constitute the behavior of organizations. Execution-monitoring and feedback is essential for individual action, and organizations similarly maintain crucial self-monitoring subsystems as a source of information. While feedback for the individual can stem from outside sources, self-monitoring subsystems gather information primarily internally, as they play a role in adapting actions to the internal requirements of the system. These subsystems include, for example, communication networks, accounting systems and resistance to change. Since resistance is communicated within the organization and serves diagnostic and pragmatic functions, it can be identified as a self-monitoring subsystem. Consequently, resistance is a normal occurrence, as in the Lewinian framework, but in contrast to Lewin it serves functional purposes. It can appear on all levels of the system, because self-monitoring processes span the entire hierarchy.

Resistance as a self-monitoring subsystem shifts the analysis from causes to effects. The pain analysis in combination with the theory of self-active systems paves the way for the study of the effects of resistance, mainly its informative functions. Thus, a functional analysis perceives resistance as an independent variable, providing feedback to the organization, as shown in *Figure 2.1* below (Bauer, 1991, p. 185).

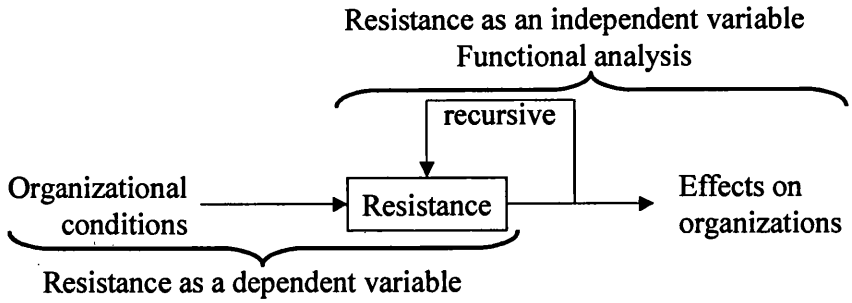


Figure 2.1: Conditional versus functional analysis of resistance

In addition to feedback provision to ongoing activities, resistance has recursive effects, that is, it changes its own course. As changes in the ongoing activities are triggered, this results in modulations of resistance. If process alterations meet original demands, resistance will vanish. If alterations are insufficient or non-existent, resistance might increase or become chronic.

In sum, resistance serves the function of a reality principle of changes and indicates necessary alterations as adaptive requirements.

2.4 LINKING LEARNING AND RESISTANCE: ARRIVING AT A RESEARCH QUESTION

Learning grounded in experience closely relates action or work practice to processes of knowledge generation. Some authors explicitly highlight the proximity and interrelation of working, learning, and innovating (Brown & Duguid, 1991). However, working and learning are often intuitively understood as antithetical, since learning implies change and working might be seen as resistant to change (Weick & Westley, 1996).

When juxtaposing learning and change, in principle two different sequences with either construct as a starting point can be imagined; that is learning leading to changes in practice, or changes in practice triggering learning. Organizational change is defined as "a set of behavioral-science based theories, values, strategies and techniques aimed at the planned change of the organizational work setting for the purpose of enhancing individual development and improving organizational performance, through the alteration of organizational members' on-the-job behaviors" (Porras & Robertson, 1992, p. 723). On a somewhat less technical note, Huber et al. (1993) see change involving a modifica-

tion of parameters of "how an organization functions, who its members and leaders are, what form it takes, or how it allocates its resources" (p. 216). Analyzing the latter definition, a learning-change sequence could be interpreted either way again.

Early protagonists in the field have already expressed a certain degree of skepticism about claims that learning is purely good for all involved (Cyert & March, 1963). The micro-political implications of learning processes have long been ignored, as learning was accepted as a panacea to cope with increasingly competitive environments. As shown earlier, until the early 1990s critical responses to organizational learning and change initiatives were treated as resistance that must be overcome (Bertoin Antal et al., 2001b), a mindset that had been reinforced in the literature on organizational change for decades. Only during the last ten or so years did a reassessment of key variables of collective learning processes emerge that does not, for example, perpetuate learning as a politically neutral process, but takes into account dynamics of power and conflict. On a more general note, Schein (1996, p. 29) remarks,

> "It is my belief that all forms of learning and change start with some form of dissatisfaction or frustration generated by data that disconfirm our expectations or hopes."

The growing recognition of emotions and conflict and the way resistance is stimulated as a product of manifold power relations and functional objections merges the streams of research on organizational learning and resistance to change. Learning is associated with change, and change itself seldom comes about as a smooth transition, but is most often accompanied by conflict or resistance, as contradictory interests are likely to be at stake (Kotter, 1995).

In their call for research on the relation between conflict and learning Berthoin Antal et al. (2001b, p. 931) stipulate a challenge of the implicit assumption that conflict should be avoided or minimized in organizations by stating the following.

> "Fortunately, in the past few years there has been growing recognition that emotions, power, and conflict could influence learning. Nevertheless, there has been almost no empirical research on this point, possibly because each of these factors were seen as antithetical to learning."

Conflict in organizations manifests itself and is constituted through various forms of resistance. Resistance, defined as a "reactive process where agents embedded in power relations actively oppose initiatives by other agents" (Jermier et al., 1994a, p. 9), can be expected to occur within any type of change process. Although resistance need not follow change automatically, the apparent causality in this dyad has been the domi-

nant perspective of organizational psychology and management strategy ever since its conception by Kurt Lewin. Given its supposed ubiquity and expected effects on learning, the concept of resistance to change in organizations warrants a substantial contribution to the analysis of organizational learning.

As a result of the outlined idea of a functional analysis of resistance, in combination with the interest in organizational learning, the focus of attention is set on the two key variables of resistance to change and organizational learning. Resistance in response to projected change has the potential to cause or influence learning. The relationship is initially believed to be unidirectional, but prior learning might affect potential subsequent emergences of resistance. The shift from causes to effects within the academic debate moves the research focus towards consequences of resistance rather than antecedents. The consequence of interest for the present study is learning in an organizational context. While the feasibility of a functional analysis of resistance per se has been examined (Bauer, 1993), I attempt to explore the effects of resistance on organizational learning. If resistance ideally bears diagnostic and pragmatic qualities, or simply conveys bad news value, it will not go unnoticed in the context of organizational change. Resistance reveals reality, even if it is not understood constructively. Following the discussion on the pain analogy, awareness is expected to have a mediating role between resistance and learning. Resistance needs to be 'felt' by the organization to trigger learning. *Figure 2.2* below, modified from *Figure 2.1*, shows the research focus of the present study.

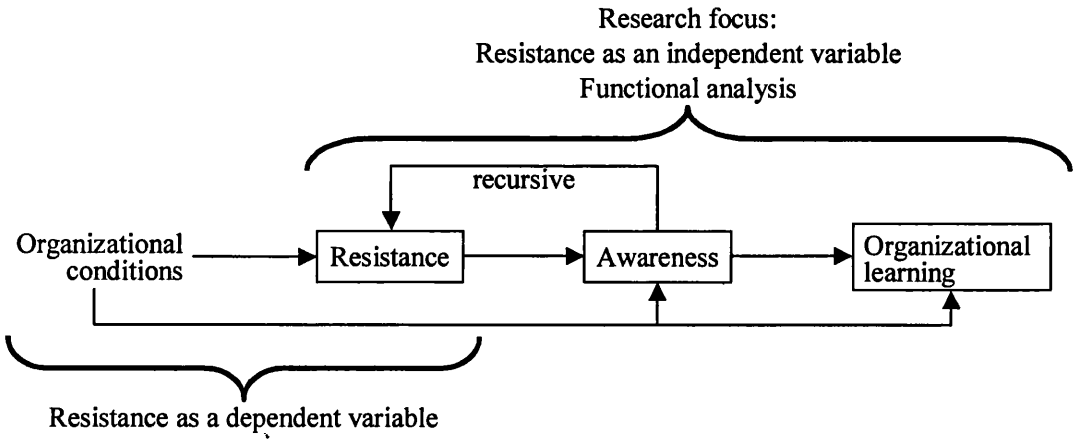


Figure 2.2: Research focus

In this thesis, a functional analysis of resistance to change as a source of organizational learning is undertaken. The proposed sequence of resistance-awareness-learning is expected to be influenced at every stage by organizational conditions such as, for example, hierarchy, power relations, or culture. Since resistance is the independent variable, the analysis concerning organizational conditions is concentrated on their influence on awareness and learning. Based on the pain analogy, a recursive effect between resistance and awareness is presumed, which might modulate the intensity and extent of resistance. Awareness holds a central role as it pertains to the subjective experience of change participants. Hence, there are two perspectives on resistance, the perspective of the observing change participants as expressed in the awareness variable, and the perspective of the observing researcher (observing the observers).

The three variables in the functional analysis allow for a combinatorial specification of possible scenarios. *Table 2.2* shows six possible outcomes of the depicted sequence.

Table 2.2: Potential outcomes of the resistance-awareness-learning sequence

		Resistance			
		Yes		***No***	
		Awareness	No awareness	Awareness	No awareness
Learning	***Yes***	Awareness of and learning from existing resistance (ideal case of optimal functionality)		Awareness of and learning from non-existing resistance (learning from psychotic or phantom resistance)	
	No	Awareness of, but no learning from existing resistance (learning blocked, missed opportunity)	No awareness and no learning from existing resistance (resistance not recognized, the project did not feel the 'pain')	Awareness of, but no learning from non-existing resistance	No awareness and no learning from non-existing resistance (irrelevant case)

This table systematically organizes possible outcomes, and empirical observations will have to verify the feasibility of some of the combinations. Especially the cases of awareness about non-existing resistance might prove to be unrealistic in organizational settings, and thereby show the limits of the pain analogy. It should be noted that while the outcomes in *Table 2.2* are logically derived, real cases might lie somewhere in between the cells.

This table again emphasizes that the immediate input to learning is not resistance but awareness of resistance. No learning from resistance is possible without awareness, and awareness needs to be understood in detail to fathom its mediating function, which facilitates resistance as a source of learning. As the subjective perspective of change participants, awareness may vary in intensity and semantic elaboration, the latter aspect indicating, for example, a functional or dysfunctional perception. Therefore an analysis of awareness, following an emergence of resistance to change, will have to explain whether awareness about resistance was present (existence), to what degree it was present (intensity), and how the resistance is perceived (semantic representation).

The plausibility of the resistance-awareness-learning triad, the ubiquity of resistance in the context of change, and the shift towards the effects of resistance, all against the background of the debate on organizational learning, lead to the following research question:

How can an organization learn from resistance to change?

An additional, albeit largely overlapping, subquestion would be 'How can resistance to change function as a source of organizational learning?'. Taking into account an initial change, the focus of inquiry lies on the ramifications of resistance to change for organizational learning, as outlined in the resistance-awareness-learning sequence. The definition of resistance used is the one proposed by Bauer (1993; 1995a, p. 113), which extends Jermier et al.'s (1994a) definition provided earlier. Bauer defines resistance to change as

> "A temporal, informal and unanticipated network of communication, that includes contributions from change agents and change recipients who are linked together in conflict. The function of this temporary structure, in form and content, is to alter the change project." [Bauer's definition is slightly modified here to fit the current context.]

This definition provides a general target function for this concept of interest in the investigation, and can be specified further once a particular organizational setting has been chosen.

Asking a 'how'-question emphasizes the exploratory approach of the investigation. The study does not follow a confirmatory approach or attempts to test hypotheses. *Contextual factors* as well as *procedural considerations* are of interest. No learning at

all from resistance is impossible, since any change will lead to learning of some kind (Nicolini & Meznar, 1995). Contextual factors pertain to the nature of the organization, its culture, the work it is engaged in, and also to the nature of the change. Indicated in *Figure 2.2* as organizational conditions, contextual factors are expected to influence all three elements of the resistance-awareness-learning sequence. Procedural factors relate to the depicted sequence and especially to the dynamics within awareness and learning. This latter aspect will be evaluated against the proposed framework of organizational learning and memory. As various contextual and procedural factors may prove influential, the research process will require adequate flexibility to account for emergent components.

The questions raised above require an investigation that evaluates theory in the light of new empirical results. This will be undertaken by means of an exploratory case study of an organizational change project. In the following chapter, I will discuss in detail the methodological implication of the research question and its connotations for an applied setting.

2.5 SUMMARY

In this chapter the second theoretical part of this thesis was introduced. The chapter contained a literature review of resistance to change that lead to the delineation of a functional analysis of resistance and concluded with the formulation of a research question.

The concept of resistance to change was introduced by first systematically addressing its inherent components. Hence, actors, objects, conditions, and manifestations of resistance as well as external perspectives were discussed separately.

Concerning the latter component, it was then shown that the dominant research perspective on resistance was one that centered on the idea of 'overcoming' resistance, and that essentially treated the concept as a ubiquitous nuisance in change processes. This perspective was popularized by an influential study, and then persistently remained at the heart of the change debate for a number of decades. The traditional view that people naturally resist change has only recently been thoroughly criticized for its impreciseness and universality. At the beginning of this development stood the idea of a sig-

nal function of resistance. Analyzing the concept as a red flag, a signal that bears important information about the change process, revealed the informative potential of resistance.

In order to research this idea systematically, it was then suggested that resistance fulfils a similarly important function to the organization as acute pain does to the human body. According to his proposition, the sequence of internal attention, reflection of current activity, and action alteration that is triggered in individuals by an experience of acute pain might occur analogously in organizations as a result of experiencing resistance to change. In this perspective, resistance has diagnostic and pragmatic qualities that refute the dysfunctionality of the concept assumed in earlier works. However, resistance, like pain, can only serve a functional purpose if it is felt, that is if there is awareness about resistance.

A functional analysis of resistance was depicted as shifting attention from causes to effects, and designating resistance as an independent variable. It was stated that this thesis employs a functional analysis of resistance to change and concentrates on organizational learning as an effect, as a dependent variable. The research focus was described as a tripartite sequence of resistance, awareness, and learning, in which each variable is influenced by organizational conditions. Finally, the research focus was translated into a broad research question: How can an organization learn from resistance to change?

3 METHODOLOGY

The empirical part of the present study is devoted to a field study of an organizational change. The purpose is theory building in the realms of organizational learning and resistance to change, structurally based on the proposed functional analysis of resistance and the integrated process framework of organizational learning. The concept of resistance to change is employed in this undertaking as an activator of subsequent cognitive and behavioral changes. Organizational learning is perceived as an effect of resistance and the awareness thereof among organizational members, while the focus of the investigation also lies on illuminating learning processes.

Researching resistance to change naturally implies an empirical investigation of some form of change. Researching organizational learning requires an organizational environment. Hence, an organizational change is the focal point of interest. Developing a methodology to investigate organizational change involves the designation of methods of data collection within a well-defined research strategy as well as the allocation of an accessible organizational setting. All three selections have to exhibit adequacy to the theoretical background and the research question, and feasibility regarding quality standards and available resources. In the following, I will provide a rationale for the choice of the utilized data collection techniques, explain the chosen research strategy and its characteristics, and introduce the context of the study of an organizational change project.

3.1 METHODOLOGICAL CONSIDERATIONS AND CHOICES

Field research in organizational psychology is characterized by studies that involve collecting original data in real organizations (Sutton & Staw, 1995). As the objective of this study is theory building, I concentrate mainly on qualitative techniques. Edmondson & McManus (2004) advocate such a research strategy if the developmental stage of the focal theory is nascent to intermediate[16]. Methodological fit in field research

[16] Qualitative techniques in research on organizations are traditionally seen as more appropriate for the purpose of exploration. The more recent debate, however, sees qualitative research equally suitable for hypothesis testing (Flick, 2002).

on early theory is best achieved by employing techniques that allow for pattern identification and the evaluation of preliminary propositions rather than hypothesis testing. The result of such field research will then be a more suggestive theory or invitation for further work in subsequent studies. Rejecting a 'quantitative' versus 'qualitative' debate (see for example Bryman, 1988b; Filstead, 1979), I agree with Bauer, Gaskell & Allum (2000), who refute 'epistemological hypertrophy' (p. 10) in favor of sound data collection and standards of good practice for qualitative research.

In the first chapter organizational learning was described as cognition, communication, and formalization interlinked at different levels of analysis. In addition, a process perspective on learning was adopted, which would preclude any attempt to measure learning in the classical outcome sense. 'Measuring' learning would in principle imply a numerical estimation of cognition, communication, and formalization. However, these processes are problematic to operationalize and quantify in non-experimental settings outside of the laboratory. Moreover, the theoretical basis relating to the research question is not sufficiently developed to justify exclusively quantitative measures. Hence, the outlined approach of theory building requires exploration and mapping of processes rather than measurement.

Having outlined three levels of analysis, different methods of data collection are required to account for different learning processes. The methods need to be able to reflect awareness and learning of individuals, groups, and the organization, while at the same time providing enough flexibility to capture episodes of resistance. For the individual level, I choose *personal interviews* of change agents and recipients to reconstruct the organizational change and to explore cognition relating to learning and resistance. The same objectives, albeit not relating to cognition but formalization, are pursued at the organizational level by an *analysis of organizational documentation.* Documents are essential in the formalization of learning and the understanding of resistance ex post; they reflect an official endorsement, and make organizational knowledge distributable and widely accessible. Both methods have the advantage of enabling retrospective data collection about past events (see *Figure 3.2*, p. 138). This latter point illustrates the challenge of collecting data for the group level, if the process of interest is identified as communication through verbalization or action. Such communication by definition only exists in the present and would require some form of participant observation or recording technique. As this is rarely possible, for the present study a direct observation of

group level learning was substituted by questions about group experiences during the individual interviews, and by a search for group-specific action in documents. Data collection at the group level instead focused on respondents' perceptions of resistance to change, and the frame of reference they use in their cognitive representation of the topic. An inquiry into the construction of meaning about resistance is necessary in order to be able to assess how different modes of this independent variable might influence its function as a source of organizational learning. The technique employed for this is the *repertory grid.*

The choice of techniques is summarized in *Table 3.1.* All methods have been applied repeatedly in similar research contexts (see for example Bood, 1998; Bryman, 1988c; Easterby-Smith, Thorpe, & Lowe, 2002), and will be explained in detail further below in section 3.4 on the data collection.

Table 3.1: Overview of data collection techniques

Level of analysis	Method	Primary focus	Subjects
Organization	Document analysis (also covers the group and individual level)	Learning and awareness of resistance	n/a
Group	Repertory grid analysis (also hints at individual and organizational level)	Awareness of resistance	Change agents and recipients
Individual	Interview (also covers the group and organizational level)	Learning and awareness of resistance	Change agents and recipients

Using three different methods allows for triangulation in an attempt to complement each technique's strengths and weaknesses (Jick, 1979), prevent common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), and maximize validity (Flick, 1992). Striving for methodological fit in the empirical enquiry produces internal coherence between the research question and the data collection. The choice of methods made here is based on theoretical considerations, the methods' specific characteristics and feasibility, and the nature of the investigated organizational setting. Once the actual field setting has been introduced further below, a clear link between the variables in the research focus and the types of data generated by the chosen three methods will be provided in section 3.4.1 (see *Table 3.2*, p. 138). The research strategy that facilitates the data collection is a *single case study of an organizational change project.* An outline of this strategy as well as a justification of its use is given below.

3.2 SINGLE CASE STUDIES

The case study is a research strategy that centers on understanding the dynamics present within single settings. It is a detailed examination of phenomena which are believed to exhibit the operation of some identified general theoretical principle (Mitchell, 1983). Case studies provide a way of organizing social data so as to preserve the unique character of the object under study. Yin (1994) describes case studies as a strategy to investigate a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. Yin emphasizes three more explanatory points, which are of particular relevance to the present study, and which anticipate and substantiate the reasons for the choice of this particular research strategy given further below. Case studies enable the researcher to cope with the technically distinctive situation in which there are many more variables of interest than data points. As one result, they rely on multiple sources of evidence, with data needing to converge in a triangulated fashion. As another result, they benefit from the prior development of theoretical propositions to guide data collection and analysis (Yin, 1994, p. 13).

Case studies can employ a single- or a multiple case design, where the latter follows a rationale that favors comparative investigation and places emphasis on the robustness of results. The focus of the case study may appear in different formats. For example, single individuals can be the objects of study. Other units of analysis might be a singular event or process, an organization, or a whole community. The same case study might involve more than one unit of analysis. In such an embedded case study design (as opposed to a holistic design), attention is given to subunits within a single case (Yin, 1994). The investigation typically combines data collection methods such as archives, documentation, interviews, questionnaires, observations, or even physical artifacts. Through this combination of methods, case studies enable the researcher to create an insight into, for example, facets of organizational life which are not well documented, and which are not amenable to inquiry through fleeting contact.

Research strategies in the social sciences might consist of experiments, surveys, archival analyses, histories, or case studies; all with the purpose of obtaining empirical data. Using the case study as the strategy of choice for inquiry requires some explanation, which will be provided in the following.

3.2.1 The single case study as a research strategy

The first and most important reason for the choice of the case study as a research strategy are the characteristics of the prior theoretical developments. Due to the absence of comprehensive theory in the focal field, various integral components were combined into a process framework of organizational learning across levels of analysis. The organizational learning framework and the considerations about the role of resistance and awareness at different levels function as a guide to data collection and data analysis. Returning to Yin's (1994, p. 13) definition, this is a theoretical fundament with many variables of interest, but fewer realistic data points (i.e. certain individuals, certain groups, the project documentation). In addition to the practical constraints outlined above, this rules out rigorous testing of hypotheses in a single initial study. However, the purpose of empirical inquiry in the present study is one of *theory building* above anything else. Following an *inductive, exploratory approach*, the case study is used here to provide description and generate theory (Eisenhardt, 1989a; Hartley, 1994). The case study allows for the collection of evidence from multiple sources, and the subsequent triangulation of that material, facilitating a rich familiarity with the case. Using the proposed framework as a strategic guide, the value of further investigating various propositions can be debated and areas of emergent theory can be probed. Thus, evidence from a single case can be used to reformulate preliminary propositions into actual hypotheses, generate new hypotheses for later studies, and therefore advance the theory building process.

A second reason arises from the nature of the research environment. Given the theoretical streams of organizational learning and resistance to change, the 'logical' focus of an empirical study is on organizational change. Such a change needs to be investigated in a real-life setting, as laboratory studies are mostly inadequate to reflect the internal dynamics of whole organizations. Contemporary management rhetoric proclaims environments and commercial organizations within them as constantly changing (Kotter, 1996). However, most, if not all, of such changes do not occur as the result of some rigorous experimental treatment, but as the result of market pressures, strategic orientation, efficiency considerations, or government regulations. Research in organizations in general, and on organizational change in particular, suffers from the difficulty of applying the scientific method in surroundings that are not conducive to external manipulation or interference with internal processes (Bryman, 1988a). In the overwhelm-

ing majority of organizational settings it is neither feasible nor possible to implement an experimental design for an organizational change (i.e. experimental and control group based on random selection and assignment, pre- and posttest), and control or hold constant all extraneous variables. Hence, the experiment as a research strategy is most often not a practicable option.

Anticipating the discussion of access difficulty in section 3.3.1, a third reason for the choice of research strategy is a further consideration of practicality. Comparative research on organizational change requires access to a number of subunits or whole organizations, which is at best problematic (Freeman, 1986). Research at multiple sites is also likely to lead to a substantial increase in the costs of the study. In addition, due to the use of several data sources, the volume of data generated in a single within-case analysis alone can reach overwhelming dimensions[17]. For a single researcher, it is therefore imperative to limit the access problem, control expenses, and cautiously manage the extent of data collection and analysis. The research strategy of the single case study enables the researcher to guard against resource exhaustion while maintaining a high standard of inquiry.

3.2.2 Research design

In the language of experimental design, case studies are usually described as belonging to the categories of quasi-experimentation or non-experimental field studies, depending on their specific type. In contrast to true experiments, where subjects are both randomly (and supposedly representatively) selected from a given population, and randomly assigned to a treatment or a control group, there is no random assignment in quasi-experiments. Here, self-selection or administrative decisions determine who is to be exposed to a treatment in a given field setting. Non-experimental field studies share the same setting with quasi-experiments, the real world outside the laboratory, but this design has neither random selection nor random assignment. The non-experimental technique relies on measurement only. There is no manipulation or active control of variables, and no assignment of subjects to groups.

The research design category for the present study is a *non-experimental field study*. Although this design category is probably the most popular in organizational re-

[17] For example, Mintzberg & McHugh (1985) examined 2,839 films, which was only part of their evidence, in a study on strategy making at the Canadian National Film Board, resulting in a 383-page report.

search (Beehr, 1995, chapter 2), it is comparably weak regarding generalizability and the strength of causal inference. As theory building, however, is the main aim of this study, establishing causal inference is not a prime topic of concern. Generalizability is of interest, but not in a statistical sense, which will be elaborated in the discussion of external validity further below. Thus, the criticism of this particular design category is based on research targets that differ from the one in the present study.

The research strategy here is the single case study of an organizational change. An *embedded design* is applied, which involves the use of sub-units of analysis within the larger context of the case (Yin, 1994, chapter 2). Deriving from the theoretical discussion, the three units or levels of analysis are the individual, the group, and the organization.

The present study combines two specific research designs that will be illustrated using Cook et al.'s (1990) notational system. Here, O stands for an observation and X stands for a treatment. Please note, however, that the treatment in this case was not administered by the researcher, but represents the implementation of the organizational change. All levels of analysis undergo the same change. The methods of data collection were introduced and will be explained in detail further below. They were selected for their respective and complementary potential to unravel aspects of information processing at different levels of analysis, and they refer to different data sources, which can be triangulated in the analysis.

The first design is an *interrupted time series* with several measurement points before and after the organizational change.

$$O_1 \; O_2 \; O_3 \; O_4 \; X \; O_5 \; O_6$$

The interrupted time series design is used for the analysis of documentation about the change and allows for a retrospective investigation into information processing mainly at the organizational level. A time dimension is actively used to map the sequence of events inherent to the organizational change.

The second design is a *multiple posttest design* with one observation after the treatment. The dotted line indicates that the two groups are separate and unequal.

X O_1

X O_1

These two posttests refer to individual interviews and repertory grid analyses with groups. Hence, this taps mainly into information processing at the individual level and the construction of meaning about resistance. Both designs are inherently retrospective in that they focus on a past event, although the repertory grids are not necessarily limited to the change itself.

Describing the research design as it is done above implicates a devaluation problem. The taxonomy of research designs advocated by authors like Donald T. Campbell and Thomas D. Cook reflects unreasonably negatively on the case study as a research strategy, or on its inherent research designs. In their earlier works, these authors generally dismiss the approach by referring to it as the *one-shot case study* (Campbell & Stanley, 1966; Cook & Campbell, 1979) that has nothing to offer but inconsistency concerning generalizability and internal validity. However, the reductionist and clinical language of classic experimental design seems inappropriate to capture the potential for multimethodology, triangulation, and depth of inquiry behind the case study approach. In a more recent publication Cook et al. acknowledge this and rename the original, deprecating term into 'one-group post-test only design' (1990, pp. 517-518), which, they stress, should also not be confused with a fully-fledged true case study. In addition, these authors recognize the usefulness of case studies for suggesting new hypotheses and for exploratory research in general.

The case study method is often criticized, as mentioned above, for alleged weaknesses concerning standard criteria that are used to evaluate the quality of social scientific research. Although the analysis of single cases has produced very influential results, such as the examinations of Anna O. (Breuer & Freud, 1895) or Little Albert (Watson & Rayner, 1920) that helped inaugurate the respective fields of psychoanalysis and behaviorism, the criticism centers on the lack of generalizability of findings. In an early consideration, Dukes (1965) therefore limits the applicability of single case studies to three instances: When the variance of central variables is small (i.e., a single case ap-

proximates the prototypical case), when opportunities for observing a phenomenon are limited (due to situational complexity or subject scarcity), and when the evidence has the potential to falsify a universal claim. While these instances certainly prove adequate, more recent reflections have refined the generalizability discussion. These have not only extended the number of applicable instances, but have more generally justified the use of the single case study as a research strategy. The main quality criteria will be discussed separately below.

3.2.3 External validity

The criterion of external validity refers to conclusions about the extent to which results can be generalized across populations, settings, and times. Case study research has often been devalued in this respect, since common sense rejects the idea of justifiably extrapolating from a singular case to more general social principles.

One argument against this devaluation targets the underlying assumptions of the research process in the field of social sciences. A distinction is made between the nomothetic approach, which "seeks to establish abstract general laws for indefinitely repeatable events and processes" and the idiographic approach, which "aims to understand the unique and nonrecurrent" (Nagel, 1961, pp. 547-548). Any discussion about external validity is only relevant if the purpose of the research process is to find an invariant and universal law. Hence, the criterion of external validity is a concern only when a universal law over a variety of groups or an invariant law over space exists. Numagami (1998) argues, however, that there are no invariant laws in management or organization studies. Instead of concentrating on means to increase generalizability, he writes that the basic premise of the existence of invariant laws in social phenomena is not sustainable, and illustrates his claim with concepts borrowed from game theory. The central proposition is that lawlike regularities in social phenomena do not exist per se, like natural laws in physics for example, but are created by human conduct. There might still be stable patterns in social phenomena, but those are not supported by inhuman forces, but rather by the stability of knowledge and shared beliefs. As a result, a pursuit of external validity would be irrelevant for the case study method.

A different argument criticizes the supposed infeasibility of extrapolating from single cases from a somewhat more pragmatic perspective. The logic behind the infeasibility claim rests upon an erroneous application of statistical notions, and on implicit

comparisons to survey research. In a survey, generalizing is achieved through sampling techniques in an attempt to create a sample that is representative of some population. In many cases this is rather difficult, since the exact nature of the population often remains obscure, which leaves the question of what the sample is representative of unanswered. The logic of inferential statistics ascertains statistical significance as a necessary (but not sufficient) precondition for generalizing from samples to populations. However, equating statistical significance with theoretical significance is highly misleading since, for example, even the most trivial relationships can be statistically significant if a given test has enough statistical power. Instead, it is necessary to recognize that the rationale of extrapolation from a statistical sample to a parent population involves two different inferential processes (Mitchell, 1983, pp. 197-207). Statistical inference represents the confidence of stating that the surface relationships observed in a sample hold for the parent population. Theoretical, or logical, inference refers to the confidence of assuming that the theoretically necessary relations among the variables in the sample also pertain to the parent population. The important point here is that for a single case study, the targeted 'population' is not the universe of all similar cases (e.g., organizational settings, individuals), but an underlying general theoretical principle. Hence, the generalization of case study results is essentially about theoretical propositions, not about populations (Hartley, 1994). The question about the typicality or 'representativeness' of the case is therefore irrelevant to the extent that the selected case has revelatory power. If it does, analytical generalization allows the researcher to connect particular results to some broader theory (Tsoukas, 1989). This process might involve some kind of pattern-matching between implications derived from the theory and observations made in the local setting (Campbell, 1975). It may also require the systematic challenging of opposing explanations.

Analytical generalization is analogously used in experiments, when the researcher generalizes the results of a laboratory experiment to a theory rather than to some general population. Yin (1994) points out that in scientific experimentation one does not attempt to select 'representative' experiments, but uses a logic of replication to probe theoretical propositions. Therefore, the case under study is not a sample, randomization is not a *conditio sine qua non* for external validity, and the objective is not to enumerate frequencies, but to deliberate and infer theory (Tsoukas, 1989).

3.2.4 Internal validity

If the variation in an outcome can be reliably attributed to the controlled treatment of an antecedent event, the resulting causal relationship is internally valid. In a controlled experiment, this usually refers to the degree of certainty with which a manipulation of an independent variable caused the modulation of the dependent variable. Establishing internal validity is the spirit and purpose of any experimentation, and internal validity presumably has priority over any other type of validity. Several threats to internal validity have been identified, such as the interference of statistical regression due to erroneous pretest scores, maturation and mortality of subjects, changes of the measuring instrument, or ambiguity about the direction of causal inference. Cook et al. (1990) discuss these threats and ascertain choice of research design, namely choosing the true experiment wherever possible, as the prime strategy for increasing internal validity. In the case of lesser designs, where random assignment to experimental groups might not be possible, the investigator has to rule out threats one by one, for example through statistical adjustment.

The definition above illustrates that internal validity is only a concern in explanatory studies, where the goal is to establish causal inference. For descriptive or exploratory (case) studies, as in the present study, considerations about internal validity are not applicable, since it is not attempted to manipulate variables or make strict causal statements.

3.2.5 Construct validity

This term refers to the degree to which inferences can justifiably be made from the operationalizations in a study to the theoretical constructs on which those operationalizations were based. The problem is one of possible 'confounding' that is, the possibility that the operational definition of a cause or effect implies more than one construct. When trying to establish construct validity, a theoretical approach is to embed the construct under study in a nomological network of proximal (or also distal) constructs (Cronbach & Meehl, 1955). Such a network would include a representation of the constructs of interest in a study, their observable manifestations, and the interrelations among and between them. A classical, practical instrument to undertake a construct validation is the factor analysis. Construct validity requires not only that measures of some construct covary with other measures of the same construct (convergent valida-

tion), but also that there should be evidently less covariation between measures of related but different substantive constructs (discriminant validation). Campbell & Fiske (1959) propose a systematic experimental procedure, the multitrait-multimethod matrix, for analyzing convergent and discriminant validities. However, these methods rely on measures that are readily quantifiable, as is the case in survey studies.

Construct validation is not accomplished exhaustively in a single study. It requires an accumulation of evidence derived from many different sources, and is both an empirical and a logical process. For case studies, construct validity is preferably ascertained during data collection and composition. One tactic available to increase this type of validity in case studies is the use of multiple sources of evidence (Yin, 1994, chapters 2 and 4), which essentially provide multiple measures of the same phenomenon, thereby enabling convergent validation. Converging lines of inquiry can be developed in an effort to triangulate on the construct of interest. The present case study employs three methods of data collection to account for these requirements. A second strategy is to maintain a chain of evidence during data collection, which allows an external observer to backtrack the logical argument from the conclusions to the empirical data upon which they rest. The chain of evidence for the present study is shown in the analysis sections for the three types of collected data. A third tactic suggested by Yin is to have the draft case study report reviewed by peers and key informants. This was done here by presenting the results of the study to two groups of respondents on separate occasions (see section 3.4). Both groups approved the veracity of the findings.

3.2.6 Reliability

Reliability refers to the consistency or stability of any experimental effect. A reliable measurement procedure is free from unsystematic errors of measurement. In classical test theory this quality criterion is quantified as a coefficient calculated as retest reliability, parallel reliability, split-half reliability, or internal consistency (Lienert & Raatz, 1998). In individual measurement, a reliable test produces the same score every time it is administered to the same subject. It can be replicated multiple times leading to the same results. As classical test theory defines any test score as a composite of true score and error component, a reliability coefficient allows for the calculation of the standard error of measurement as an indicator of the amount of inconsistency in an individual score.

In case study research, the case under study is usually a fairly unique individual or event, or the case was specifically chosen for its 'atypicality' and probing power in theory building. However, the logic of replication does not imply to reproduce the results of one case by doing another case study, but instead in arriving at the same results if a different researcher analyzed the same case. Hence, establishing reliability in case study research means to minimize errors and biases in a study (Yin, 1994, p. 36). This is achieved by keeping a precise account of procedures in the form of a case study protocol or a case study database. As illustrated in the discussion on construct validity, exact documentation and operationalization of all the steps involved in data collection and analysis enable external investigators to comprehend the flow of arguments. In this way, peers or other informants can undertake an appraisal of reliability through review.

3.3 SETTING OF THE STUDY

After an initial description of the access problem in applied organizational research, the following section on the setting of the empirical study will intorduce the focal organization and the actual project examined. In addition, comments on my role as a researcher and on learning and resistance in the change project are provided.

3.3.1 Getting access

Getting access to an organization to do research is a learning experience in itself. Field work and data collection in the applied organizational psychology are to a great extent dependent on access to organizations and participants' willingness to cooperate. That this is often a problem holds true for organizational learning research, which has frequently been criticized for producing comparatively few empirical results. In particular commercial organizations follow their own purpose and schedule. Data collection in such organizations may be fundamentally altered or even unilaterally terminated at any given point in time. In contrast to laboratory studies, any organizational research design, as well as the chronological order of a given study, have to be highly flexible to provide an ability to react to such contingencies. Extensive, multiphase research designs with various treatment and control groups, for example, are rarely feasible, unless the researcher has direct decision control over organizational procedures. Hence, adequate

flexibility will permit the realization of a study, which nonetheless still has to adhere to quality criteria of scientific research.

Approaching an organization and convincing key stakeholders of the advantages of taking part in a research study can be an extremely time consuming process. Academic work in the social sciences usually produces results that are not readily compatible or exploitable for commercial purposes. Given a perceived uncertainty of potential benefits, organizational decision makers are likely to weigh common reservations such as time requirements and confidentiality concerns against participation (Buchanan, Boddy, & McCalman, 1988). Perceived potential benefit is generally also linked to the experience or reputation of the academic research team, and hence will be diminished accordingly in case the 'team' consists of a single doctoral student. For such reasons, seasoned researchers discard 'cold calling', for example, as a waste of time, and advise to exploit personal contacts. The amount of time and patience required to gain initial access should by no means be underestimated (Easterby-Smith et al., 2002, p. 71). Van Maanen and Kolb (1985, p. 11) summarize this by saying that "gaining access to most organizational settings is not a matter to be taken lightly but one that involves some combination of strategic planning, hard work, and dumb luck". Barley (1990, p. 228) highlights an additional important lesson about gaining entry when he states that "despite an academic's proclivity to think otherwise, whom one knows is often far more practical than what one knows."

Confirming Barley's conclusion, access to an industrial organization was eventually secured through personal contacts and a mutual interest in the research topic. It should be noted, however, that the entire process of gaining access, involving many unsuccessful attempts at various organizations, took the better part of 10 months.

3.3.2 The organization under study

The organization that provides the environment and focus for my analysis is Rousseau & Paul[18], a German manufacturing company that specializes in tableware and bathroom and sanitary ceramics.

Rousseau & Paul (R&P) was founded in 1748 as a small manufacture for tableware products in the northeast of France, and has been run by members of the two

[18] The names used from here on for the company, its employees, and the specific locations of its sites are all pseudonyms.

eponymous founding families ever since. The company was moved to southwest Germany in the late 18th century, and has since been headquartered in a small border town called Moorsfeld, where a baroque abbey is used as the location of the principal offices. Throughout the 19th century, the company grew through innovative production techniques for crockery, tiles, and bone china, and became industry leader following the opening of new production facilities in Moorsfeld and in close by Mitterwald. The turbulence of two wars and a resulting restructuring of the company mark the first half of the 20th century. A third production site in Luxembourg was opened in 1959 and more sites were to follow through acquisitions in Austria, Hungary, Italy, Sweden, and Holland. In 1987 R&P went public, being listed on the stock exchange from 1990 onwards, but still with the founding families as majority stakeholders.

Today the company is a manufacturer with a global outlook and European and world market leadership in various industry segments. About 11,000 employees generated a turnover of € 977.5 million in 2002, with an operating result before taxes of € 27 million (Rousseau & Paul AG, 2002). The foreign business share of the company's activities is currently at 70%. Main markets are Germany with 30% of sales, France, Spain, the UK, and Benelux with a combined 46%, Scandinavia with 9%, and the US with 6% of sales. Production is spread across 21 sites in 12 European countries, and products are sold through subsidiaries or independent distributors in 125 countries. The organization is divided into four divisions, namely bathroom, kitchen, and tiles (as one), tableware, wellness, and project business. Strategic objectives as stated in the 2002 annual report are a long-term reorientation from manufacturer to lifestyle provider, and an increase of international market shares, especially in the luxury goods markets of the Unites States and Asia. R&P tries to achieve this through innovative products and marketing, strategic acquisitions, and an information technology (IT) based integration of all business activities, using SAP R/3 software, that was started in 1996.

3.3.3 Defining the focal project

Rousseau & Paul was approached in February 2002 through a personal contact in the management of the tableware division. A short presentation of the objectives, requirements, and benefits of a possible research study were discussed over telephone and a visit to headquarters was arranged for early March. This visit included an initial meeting with a member of the global management board, who gave his approval, and subse-

quent meetings with executives in IT and logistics. Here, various possibilities for a case study were evaluated regarding such aspects as feasibility for a single researcher, time frame, location, internal access, and results for the company.

At the time R&P had introduced two major changes to its operations, which were significantly interlinked, and followed a concept originally devised by a management consulting company. Storage and distribution for the European market were consolidated in the form of a giant warehouse facility in Mitterwald that centralized logistics and thereby made redundant smaller storage units in other countries. Through this, the flow of goods would lead directly from the nearby main production sites into a single computerized storage unit. Automated packing in cooperation with truck operating haulage contractors now enables R&P to guarantee direct delivery to any country in western and central Europe in principle within 72 hours. This major logistical change was largely made possible by the integration of the company's IT infrastructure on the basis of SAP's R/3. The R/3 software[19] is a leading tool for enterprise resource planning that integrates the computerized management of various aspects of running a business. It is installed enterprise-wide and uses a modular structure to support a broad spectrum of key operational areas of the organization, such as procurement, financials, sales, human resources, or facility maintenance. Interlinking the organization as a whole, even across sites and national boundaries, the system makes possible to forecast, for example, staffing requirements, raw material stocks, capital commitment, and pricing ranges for any given order volume. Hence, key advantages of the SAP system are its potential to end the fragmentation of current systems, to allow a process of standardization, and to give more visibility of data across the entire organization (Sammon & Adam, 2000). At R&P, the stepwise, company-wide introduction of SAP, first in Germany and then in other countries, facilitated the logistical restructuring towards a centralized distribution system.

The software implementation as the core of the company's major recent change fit precisely into the research aims for learning and resistance. Numerous earlier studies on the introduction and use of new computer systems have identified learning and change

[19] 'R/3' as the product name is mostly substituted by 'SAP', as it is the company's main product. The two names will be used interchangeably here.

requirements as central aspects of such projects (e.g., Bauer, 1993; Brown & Duguid, 2000). During the first day of meetings at headquarters, it was explained that SAP had been introduced recently to the company's UK subsidiary, which was the last one in a succession of implementations in all of R&P's European affiliates. The UK subsidiary combined a manageable smaller size with a relative independence within the R&P group, which would allow for a comparatively less confounded isolation of effects. In addition, the location in the south of London permitted easy and frequent access from my base at the London School of Economics. Following my expression of interest for the British project, the UK management was contacted the same day and informed about the research cooperation. The next four days at headquarters were spend getting to know the company, informally talking to people involved in the UK project as well as other executives such as the head of personnel, and familiarizing myself with the changes to the IT infrastructure and the distribution logistics.

3.3.4 The change project at Rousseau & Paul in the United Kingdom

R&P's serious entry into the British market officially started in 1987 when they took over a tableware company called Perevia, whose main supplier they had been for almost two decades prior to that. The British subsidiary from then on operated under the name of Rousseau & Paul UK and was relocated to Sullsgate in the south of London. Today, R&P UK sells bathroom and tableware, although the latter is its main activity, and accounts for about five percent of R&P's global sales in those segments. Sales channels are two own retail shops, about 45 concession shops in larger department stores or shopping centers, and a factory outlet store next to the principal offices in Sullsgate. In 2003 the UK subsidiary employed 230 people, most of which are situated at shops across the country or belong to a smaller group of traveling sales representatives. This reduces the staff that is constantly located at Sullsgate to about 25 people.

Before the change project R&P UK was an independent subsidiary that managed its pricing, marketing, and staffing with little specification from Germany. It operated its own warehouse adjacent to the main offices in Sullsgate, from which a warehouse crew of 13 employees organized storage and distribution. All products went from the production sites in Germany into interim storage at Sullsgate before they were delivered to retailers across the UK. The company worked on a computer system called MACH-

X, which was installed in 1990 and became increasingly outdated and inadequate for the organization's needs. The system was supported by an IT department of four employees. Other employees working at Sullsgate mainly included people in the customer service and accounting departments. The named departments - warehouse, IT, customer service, and accounting - represent almost the entire workforce at the UK headquarters, except for a few support staff and a janitor, and these departments were all affected by the subsequent changes.

In late May of 2001 a meeting was arranged between the UK management and a German team of IT and logistics executives. At the meeting in London the British managers were told that their IT system would be changed to SAP and their warehouse would be closed and storage and distribution permanently substituted by the larger facilities in Germany. These changes would necessitate the dismissal of 11 workers in the warehouse, the dismissal of the general operations manager, and a substantial shrinkage of the IT department in the UK over time. A timetable was set to end the warehouse op-

tart from July 2001. All
n be seen in *Figure 3.1*,

German and British management teams were scheduled to s
people involved in the management of the change project ca
which is the official project management chart.

Subsequently, the agenda of the monthly meetings dealt entirely with issues related to the transition of the warehouse to Germany and the data migration and implementation of the SAP system. An initial training in R/3 for the British management in October 2001 was followed by training sessions for customer service and accounting employees in January 2002. The change project proceeded according to schedule and by May 2002 R&P UK was operating entirely on the SAP system, delivering stock directly from the German warehouse to its customers.

3.3.5 My role as researcher

My research at R&P UK was endorsed by a senior manager at headquarters who stood in direct contact with the board member responsible for the tableware division. This manager provided me with the initial internal contacts and used his authority to request cooperation from the management at the subsidiary. Reflecting Van Maanen & Kolb's (1985) emphasis on the importance of 'sponsors' in the organization to get past 'gatekeepers' of information, the German senior manager negotiated my first meeting at the British site with John McGregor, the UK managing director. While the helpful effort was most certainly beneficial to getting immediate access, it somewhat diminished my initial chance of being perceived by UK management as an independent agent. The endorsement from headquarters in combination with the intuitively disturbing cause of doing research on resistance stirred British managers' concern and suspicion. In addition, my initial appearance, dressed with suit and tie, supported an impression at the subsidiary of a business consultant sent from Germany to make an inquiry with potentially unforeseeable consequences. As these negative expectations became apparent during the first meeting at the UK site in Sullsgate, gaining trust was of pivotal importance for subsequent encounters. Therefore, I spent much of the time in the following meetings with UK managers and employees carefully emphasizing my status as an independent academic, who has no loyalty or obligation whatsoever to R&P's German headquarters. This was underlined visually by my dressing down, and illustrated by descriptions of my personal and university background. It was also crucial for local participants to be ensured on numerous occasions that their answers would be treated with complete confidence, which was also assured to them in writing (see Appendix D). While extending the total field research period, the efforts of gaining participants' trusts

were necessary to obtain veridical responses and thereby validate the data. An indicator of the cogency of obtained data and the conclusions drawn from them was the approval by participants once the analyzed material was presented to them at the end of the research process.

The issue of trust and safety to discuss and evaluate potentially controversial topics became apparent again towards the end of the data collection, when one British managers refused to take part in the repertory grid exercise. As will be explained in section 3.4.4, the purpose of the repertory grid sessions was to tap into respondents' perceptions of resistance to change. After an initial outline of the method, the particular manager became disgruntled and stated that he felt tired of having the subsidiary associated with resistance, since, according to him, there was no evidence of resistance during the change project. As a result, I had to explain the method as well as the rationale for using it in the study, which then necessarily excluded the manager and his colleague in the room from being subjects. This episode illustrates how the apparently negatively laden topic of resistance influenced respondents' receptiveness of the research study. Although not affecting data quality, the difficulty of the resistance topic did affect the quantity of the collected data in this single instance. The episode also further stresses the importance of building trust when doing potentially intrusive research in organizations (Van Maanen, 1988). Implications of this finding relating to the research process will be elaborated in the discussion chapter in section 5.3.

3.3.6 Learning and resistance and the change project

My enquiry and data collection at the British subsidiary started after preliminary meetings with German and UK managers in April 2003, roughly one year after the changes occurred. This time lag ensured employees' extensive experience with the changes and their effects while being close enough temporally to be remembered in detail. My research sought to answer the basic questions of how the changes caused learning at different levels of analysis, whether the changes led to emergences or expressions of resistance, and how such resistance was handled and, ideally, functioned as a source of organizational learning. As a consequence, my main focus of interest was the SAP implementation, as it required fundamental learning and constituted a profound change to work procedures. Moreover, the system is still in use. Since the warehouse operations were simply closed at the British subsidiary, all former warehouse employees are not

part of the company any more[20], and are therefore not accessible to participate in the inquiry. Employees in the remaining three departments of customer service, accounting, and IT are all operating on SAP now, have gone through the change, and are still part of the organization. However, as the warehouse closure was conceptually and chronologically linked to the new computer system, it aggravated and dramatized the change for the remaining employees, and was thus expected to be a concurrent theme during the data collection.

Given the chosen organizational setting and the specific change, the general definition of resistance stated in section 2.4 can be narrowed down to a working definition that is more practical for the analysis. This working definition identifies resistance as *non-acceptance* of the change measures at R&P UK. Employing non-acceptance as a target of the investigation implies a focus on change recipients, and an interest in any critical responses to the new computer system and the closure of the local warehouse.

Fine-tuning the depiction of a key concept raises awareness about a potentially problematic contingency, namely the case of finding no resistance in the project. While intuitively possible, such a scenario is unlikely to jeopardize the goals of the present study for two reasons. First, it can be argued, based on the theorizing by Kurt Lewin (1951) outlined earlier, that any change generates some sort of resistance. Social systems will react to changes of their equilibria with certain inertia. The question of interest would then only be whether or how resistance is used for learning. Second, on a less conceptual level, even if there were a case of zero apparent resistance, this would still provide the possibility to draw useful conclusions. Since the proposed research question focuses on contextual factors and procedural considerations, a zero resistance scenario would offer the opportunity to analyze why resistance did in fact not occur, and whether this affected other learning in the project. The phrasing of the research question centering on 'how *can* an organization learn from resistance' instead of 'how *does* an organization learn from resistance' affords sufficient flexibility in this respect.

[20] Out of the 13 employees in the warehouse before the change 11 were dismissed and 2 kept for customer returns. The original two have, however, left the company in the mean time and were replaced by new ones that had not experienced the change project.

3.4 DATA COLLECTION AND ANALYSIS

The data collection and analysis section is essentially divided into four parts. The first part covers general characteristics of the data collection process, and considerations about the relations between obtained types of data and variables of interest. The following three parts pertain to the three different methods employed. Here I first explain the attributes and specific circumstances of each method, in order to then describe the structure and procedure of the respective analyses. Interviews represent the main data corpus both regarding the quantity of obtained data and the comprehensiveness in addressing the research question. While primarily targeted at the individual level, the nature of the data collection process for the interviews also allowed for direct probing of issues related to other levels of analysis. The project documentation holds the same potential to provide information about not only the organizational level, but also the individual and group level. Repertory grid data are aimed at the group level and pertain mainly to perceptions and representations of resistance within the organizational context.

3.4.1 Process characteristics, variables, and types of data

The entire data collection process took place over a 5-month period from March to July 2003. It started with an initial weeklong visit to R&P's headquarters in Germany, where the context of the study was negotiated and informal conversations were held with various executives in IT, logistics, and personnel. The German management responsible for the change project in Great Britain, as shown in *Figure 3.1*, consisted of Heinz Berwanger (managing director logistics), Peter Schmitdbauer (managing director central IT), Manfred Becker (manager customer service tableware), and Sabine Fischer (regional manager customer service export). After contacting the British subsidiary, an initial meeting was held in Sullsgate on 7 April 2003 with the UK managing director John McGregor, followed two weeks later by another meeting with the entire UK management. Here I presented the aims, requirements, and benefits of the research to Robert Walsh (manager IT), Paul Samuelson (financial controller), Kevin Franks (operations manager), and John McGregor in a formal presentation. After the second visit to Sullsgate a series of further visits was arranged with Kevin Franks to conduct interviews and repertory grids with UK management and employees throughout May and June. The former UK general manager, Hugh Prescott, who had been dismissed as a conse-

quence of the change, was visited for an interview at his house in a Kent seaside town at the beginning of July. A final visit to Germany for six days in mid-July to do repertory grids and formal interviews with the German management team completed the data collection. Documents about the change were obtained periodically throughout the five-month time span. The analyzed data were presented to the German and British management in November 2003 and January 2004, respectively. In total, 27 visits were made to sites in the UK (Sullsgate and Widechester, Kent) and Germany (Moorsfeld and Mitterwald).

The data collection involved 18 participants; four in the German management team, four British managers, nine British employees, and one British ex-manager (see Appendix A). All 18 participants were interviewed, while only 7 took part in the repertory grid sessions. On the British side, the group of participants represents almost all the relevant (i.e. working with SAP) and permanent staff in Sullsgate as shown in the organigram in Appendix B. Interviews and repertory grids were conducted in English and German with the respective participants from Britain and Germany. Most documents were in English.

All participants started their career at R&P before the change project, with an average length of tenure of 12.2 years, and, with the exception of the former general manager, were still employed with the company at the point of the data collection. An overview of the data collection and its chronological order is provided in *Figure 3.2* below.

Triangulation is attempted between methods for the same overall phenomenon (Denzin, 1989). As the phenomenon of interest involves two theoretical streams (learning and resistance) and a set of anticipated components and interrelationships, the goal is not to achieve convergent validity for a single construct or a single level in the traditional sense of triangulating strictly for validation purposes (Bagozzi, Yi, & Phillips, 1991; Campbell & Fiske, 1959). Instead, the theory building effort strives to realize plausible convergence and complementation between methods. The developed pathway through the data will frequently consist of careful circumspection and reflection of previously established findings, often requiring the revisiting of certain issues in the light of new insights. Hence, the triangulation will be an iterative analytical process of integrating and contrasting obtained findings in an attempt to detect a logical pattern in the results.

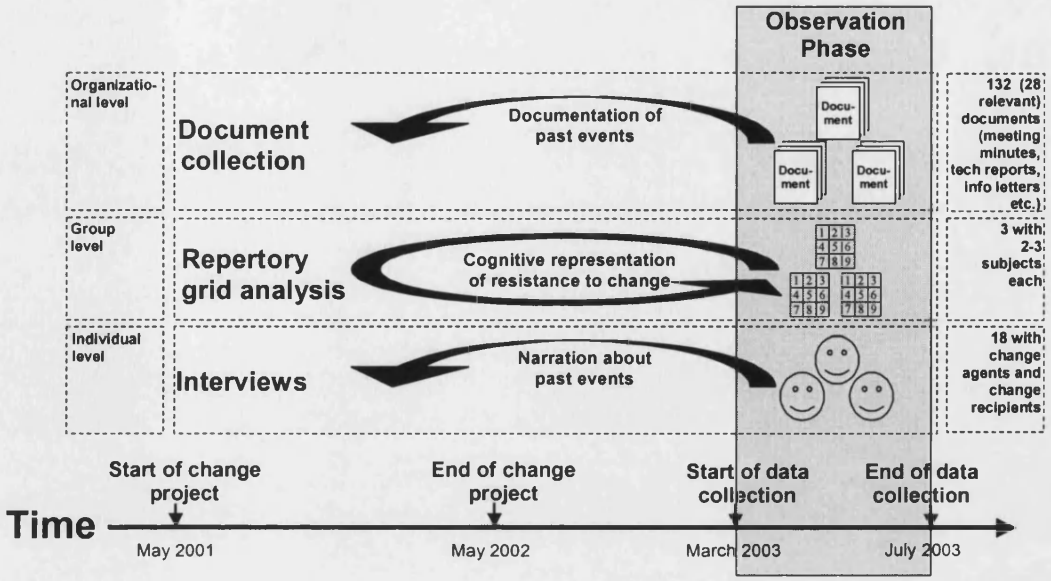


Figure 3.2: Data collection

The data collection produced three types of data, which were then utilized in generating information about the variables of interest. *Figure 2.2* (p. 110) on the research focus shows these variables to be resistance, contextual influences, awareness of resistance among project participants, and learning. In *Table 3.2* below, the focal variables are matched with the relevant types of data. Awareness, as the conceptualization of the perspectives of project participants, and as the immediate source of learning, is split into three elements. In order to fully understand this crucial variable in the project, it is analyzed whether there was awareness about resistance, how strong it was, and how it was semantically elaborated.

Table 3.2: Types of data and variables of interest

Resistance	**Context**	**Awareness**			**Learning**	
		Existence	*Intensity*	*Semantic elaboration*		
(Direct observer data)	Interview and document data	Interview data	Interview data	Interview data	Interview data	*Individual level*
		(Interview and document data)	(Interview and document data)	Repertory grid data	(Interview and document data)	*Group level*
		Document data	Document data	Document data	Document data	*Organizational level*

The data directly cover the context, awareness and learning at the individual and organizational level, and the semantic elaboration of awareness at the group level. Individual cognition is assessed through interviews and organizational formalization is reflected in documents. Group communication, with the exception of the representation of resistance, is not assessed directly, and therefore needs to be reconstructed from individual and organizational level data. Hence, interviews include questions about the group level, and documents are scanned for group level information.

The table above illustrates a conceptual distinction between resistance and the other variables, displayed by a demarcating line. In order to avoid a potentially confounding influence of respondents' interpretations, the resistance variable would in principle have to be accounted for from an external perspective through participant observation or some other form of direct, unconfounded assessment. However, as the change project was analyzed retrospectively, concurrent data collection was not an option. Through my immersion in the organization, I was able to engage in participant observation, albeit not systematically and not about current events. As a result, the 'external' reconstruction of resistance in the change project is based on my intensive exposure to the organization, on casual conversations with project participants, on uncoded interview material, on personal evaluations about the implementation process at R&P UK by members of the IT department at headquarters, and on my inferences from the interview and document data. Using partially unsystematic and partially non-independent data to assess resistance in the project is suboptimal, but in the present case the local circumstances and the general controversy and unease surrounding the topic of resistance in commercial organizations did not permit a more direct approach. However, the explorative research strategy does not require to systematically measure this independent variable, but rather to illustrate it as a stimulus. The question is not one of an objective versus a subjective account of resistance in the project, as resistance is always enacted or perceived in the eye of an observer. The core focus of the examination therefore does not lie on an external assessment of resistance, but on internal observers' awareness and learning, which directly relates to the available data.

3.4.2 Interview data collection

Qualitative interviewing is a widely used method for data collection in most types of social research. It is essentially a two-person conversation with the intent of obtaining

information pertinent to the research question under study, while focusing on content indicated by objectives of systematic description, prediction, or explanation. The interviewer attempts to achieve an understanding of situations or phenomena through the responses of interviewees. Hence, the interview is "a technique or method for establishing or discovering that there are perspectives or viewpoints on events other than those of the person initiating the interview" (Farr, 1984, p. 182). In contrast to other methods, for example questionnaires, the outcomes of interviews are less constrained by the researcher's preconceptions. As a result, the range of emerging themes in the respondents' answers might not necessarily correspond completely with the intended focus of inquiry. However, a loose structure permits space for negotiations of meanings as well as autonomy for the respondent to introduce issues that were not anticipated by the researcher.

The format of the interview can range from the totally structured to the totally unstructured (Breakwell, 2000). Structured interviews usually consist of a pre-formulated set of questions that are asked in a fixed order. They can also involve a fixed series of answers, either as statements to choose from or as a rating scale, which makes the results easily quantifiable or comparable across respondents. The opposite is true for narrative interviews, where the intention is to go beyond the question and answer schema and instead to reconstruct social events by having respondents tell a story from their point of view, with minimal interference of the interviewer (Jovchelovitch & Bauer, 2000). Somewhat in between ranges the semi-structured interview. Here, the interviewer uses a topic guide to structure the session, but remains flexible to react to emerging themes or unanticipated issues. The topic guide is constructed according to prior theoretical findings and the relevant facets of the research question, and consist of a list of themes to be addressed rather than a set of specific questions (Gaskell, 2000). Therefore, respondents are free to report from their perspective and in their own language, while the researcher ensures adequate progress concerning the focal agenda.

Semi-structured, in depth interviews were conducted with the management and employees involved in the change project. The selection[21] of employees included the

[21] The term selection is used here as opposed to sampling in order to emphasize the qualitative nature of this method of data collection. The language of quantitative research is misleading in contexts where no random probability samples are drawn. Gaskell (2000) states that "the real purpose of qualitative research is not counting opinions or people but rather exploring the range of opinions, the different representations of the issue" (p. 41).

British management (n = 4), a British ex-manager (n=1) the German management team (n = 4), and all relevant employees in the British accounting, customer service, and IT departments that took part in the change project (n = 9) for a total of 18 interviews. Therefore the strategy was more of an exhaustive inclusion rather than a restricted selection as the manageable total number of people involved in the change project in the named units allowed for the interviewing of almost everyone. I conducted all interviews between May and July 2003 on company premises in London and Germany. One exception required traveling to Kent as that particular employee, the former general manager, was dismissed as a result of the change. All interviews were tape-recorded and later transcribed for further analysis. The length of the interviews ranged between 25 and 121 minutes (*m* = 54 minutes). Due to unrecorded explanations and small talk before and after, encounters were on average 20 minutes longer. Informed consent was received in writing from all participants, and an introductory letter was sent out before the interview sessions (Appendix C and D).

The sessions started with a brief introduction of myself and the purpose of the encounter, followed by an explanation and the signing of the informed consent form. Participants were given the general intended structure of the interview as consisting of an initial description of personal information and job characteristics and a main part focusing on the change project. I followed a pre-structured topic guide that directed my questioning (see Appendix E). Before being asked for specific details about the change, participants were encouraged to 'tell their own story' about the project in a narrative fashion. While most managers reacted to this with extended monologues, most regular employees initially conceived of the interview as something resembling a television style exchange of short questions and answers. In response, they were reminded to take their time, recollect their memories, and tell the story in their own words. Deviations from the topics of interest were not interrupted, but followed through if there was an identifiable connection to the research objectives. The interviews ended after all the main themes on the topic guide had been addressed and respondents indicated that they had nothing more to add.

3.4.3 Interview analysis

The tape-recorded data sets used for the present analysis stem from formal interviews with four British managers (McGregor, Franks, Walsh, Samuelson, Prescott),

nine British employees (Peters, Farnsworth, Woolfe, Parker, Browning, Winterstein, Adams, Gupta, Naidoo), and four German managers (Berwanger, Becker, Schmitdbauer, Fischer). All interviews were transcribed verbatim, resulting in a total amount of 127,121 words with an average length per interview of 7,062 words (median = 6,602; standard deviation = 3,082), or about 320 single-spaced pages of transcriptions. The partitioning of respondents in three identified subgroups was retained for most of the analysis.

For the interview analysis, the respondents were split into the three subgroups of German managers, UK managers, and UK employees. These groups not only constitute the main parties in the project, but their job and project roles as well as task areas are also fundamentally different. Resistance has been defined as occurring between change agents and change recipients. Moreover, in the proposed learning model it is suggested that some integral processes are dominated by different organizational groups; for example a higher proportion of management is assumed for the formalization stage. A distinct organizational hierarchy might also have an influence on resistance and learning. Therefore, the awareness and, where appropriate, accommodation of a tripartite perspective in the analyses is indicated by theoretical considerations.

A content analysis was undertaken in order to achieve the following objectives. First, participants' recollections served as the basis for both the reconstruction of the change project and the comparison of interpretations among groups of actors. Second, the interview data were matched against the integrated framework of organizational learning to assess individual and collective learning in the project and appraise the process model. Third, resistance to change was examined in the interviews to analyze its role in the project in general and its influence on learning in particular. In addition, interview data was also analyzed for information pertaining to the group and organizational levels.

The content analysis involved extensive coding of textual material. The coding procedure and underlying rationale is largely similar for the interview and project documentation data. Therefore, it will be discussed in greater detail in this section, and more briefly in the later section on the documentation analysis (section 3.4.7, p. 157).

In the first stage of content analysis, several rounds of interpretive reading essentially lead to a reorganization of textual data through 'cutting up' of quotations and

'pasting' them into a newly arranged order of codes across interviews. The software tool used for this purpose was ATLAS/ti (Muhr, 1997), which provides a practicable platform that substantially enhances the formerly manual handling of textual material. The program does not, however, automatize the coding process, but greatly increases the transparency and replicability of the resulting coding frame. Together with a detailed description of coding steps, the ATLAS/ti record progresses the analysis of textual data beyond a somewhat obscure 'art of interpretation' to a thorough and accountable practice of qualitative research (Muhr, 1997; Strauss, 1987). The soundness of analytic induction will provide evidence of validity (Mitchell, 1983).

The development of a coding frame facilitates systematic comparison. The data material is addressed with the research question before the theoretical background of the introduced process model. Codes are created and used as signposts for information contained in the data. The codes are then coherently organized to fit a predetermined objective of inquiry. Hence, the resulting coding frame reflects a chosen focus and constitutes a theoretical selection that embodies the research purpose (Bauer, 2000; Miles & Huberman, 1994).

The development and production of the coding frame for the interviews in the present study has two parts. The complete unabbreviated coding frame can be found in Appendix F and G. In the first part the texts were searched for theory-relevant themes that were then organized into a coherent structure. This iterative procedure involves four different steps and results in a *'top-down' coding frame* that organizes codes in a hierarchical tree structure. Hence, I distinguished and systematized signposts of themes by marking relevant quotations, but did not yet consider content valence. For example, the basic code 'the new system' consists of five thematic codes, one of which is labeled 'quality', subsuming all remarks about the quality of the new computer system. Whether these remarks were overwhelmingly positive, negative, neutral, or mixed was not considered in the first phase of coding, because the focus lay on building a systematic coding structure. The procedure and output (reduced version, for the full coding frame see Appendix F and G) of the first part are shown in *Figure 3.3* below. In the second part of the coding process, actual values of the content of individual codes were examined in order to detect common opinions and prevalent issues. This process involved two different steps and produced a *'bottom-up' coding frame* that summarizes common content across respondents and assigns it to the previously generated codes. The data reduction here is

largely based on the frequency of appearance of values, but not exclusively so, as the uniqueness or explanatory power of a single remark in some cases made useful its direct mentioning. To use the same example as above, remarks about the quality of the new computer system, grouped under the basic code 'quality', were condensed into a short summary, a main common theme, that represents the quintessence of respondents' utterances in this realm. A main common theme generally represents an average valence of respondents' remarks for a particular code, although some main common themes represent unique remarks that were included for their explanatory power. The assigning of codes as well as the production of main common themes involves, at least to some degree, an act of interpretation by the coder. Therefore the issue of reliability deserves attention and will be discussed in a separate section below. Procedure and output of the second part of the coding process can be seen in *Figure 3.4* (this is, again, a reduced version because of the space constraints of the chapter; for the full interview coding frame see Appendix F and G). In the following I will describe the six individual steps of the two parts in detail.

The content analysis of the interview material began with an initial open coding across all transcribed texts that was informed by my earlier theoretical developments (Strauss, 1987, pp. 28-32). Hence, individual codes were pre-specified by the characteristics of the change project (e.g. a new software system, redundancies), the components of the process framework of organizational learning (e.g. formalization, group learning), and elements associated with the topic of resistance to change (e.g. change attitude, uncertainty). The open coding required two close readings of the transcribed material during which codes were assigned to individual quotations, and initially generated 33 *thematic codes.* In the second step, these thematic codes were then clustered under higher-level headings, called *basic codes*, which were themselves related to the *topic areas* in the original interview topic guide. This creation of and connection to a superordinate formation provided conceptual and structural order (Miles & Huberman, 1994, p. 62). The resulting hierarchical structure included four topic areas, comprising seven basic codes, themselves comprising initially 33 thematic codes. The topic area of communication did not exist in the original interview topic guide, but was added to the coding frame because of its frequency in the texts. Through a third reading, the existing coding frame was then tested for coherence, resulting in some reshuffling of thematic codes to basic codes, re-linking of quotations to thematic codes, and sporadic merging and split-

ting of thematic codes, the latter producing one more thematic code. In the fourth step, the harmonized coding frame was compared to the underlying theory, namely the process model of learning and the considerations about resistance. In order to comprehensively reflect theory in the coding frame, three additional thematic codes were introduced to a total of now *37 thematic codes*. A fourth reading facilitated the assignment of the new codes to relevant quotations. A frequency table showing the occurrences of thematic codes across interviews is included in Appendix H. A total of 1830 quotations from the interviews were assigned to thematic codes. After the first four steps, the creation of the 'top-down' coding frame, attention was shifted from structural coherence to content valence. All quotations related to an individual thematic code were examined to extract common themes. This extraction was guided by a search for commonalities across subgroups of respondents (UK management, UK employees, German management).

The partitioning was done at this point of the analytical process, because it was expected that due to the differing job roles, project roles, and task areas as well as different hierarchical levels of respondents, there would be distinctly different results for the three subgroups. These results would otherwise remain unnoticed in case all respondents were simply pooled together. The partitioning is theory guided in that it responds to central assumptions of the described theoretical constructs, such as the resistance dynamics between management and employees, or group learning processes that are the result of common tasks of group members.

Data reduction is the purpose behind this bottom-up approach, and it is a central part of the analysis. As mentioned above, analytic choices were based largely on frequency of appearance, but also based on explanatory power, salience, uniqueness, and general relevance to the research question (Miles & Huberman, 1994, p. 10; Tesch, 1990, p. 139). Hence, the fifth reading, which is also the fifth step of the process, educed *main common themes* across all interviews. Main common themes are extracted for all thematic codes, and hence correspond to all main issues of concern in the research study, although there is not necessarily a one-to-one match between main common themes and thematic codes. In a sixth and final step, these main common themes were summarized into succinct *categories* to guide the presentation of results.

Coding Process

1. Open coding informed by theoretical background, resulting in 33 thematic codes (first and second reading).

2. Grouping of thematic codes into 6 clusters of **basic codes** emerging from **topic areas** in the interview topic guide, plus 1 communication cluster (not in original interview topic guide, but added because of frequency).

3. Test of coherence of basic codes by content comparisons, resulting in regrouping of thematic codes, re-linking of quotations, and splitting or merging of thematic codes. 1 more thematic code (third reading).

4. Comparison of codes to theory, resulting in introduction of 3 additional thematic codes and assignment of related quotations; now total **of 37 thematic codes** (fourth reading).

Coding Frame
(see Appendix F and G for full coding frame)

TOPIC AREAS (n=4)	BASIC CODES (n=7)	THEMATIC CODES (n=37)
Personal information	Demographics and job description	Job description
		Demographics
		Commitment
Description of the change	Organizational relations	System integration
		Germany vs. UK
		Decision making
	The project	Concern
		Prior implementations
		Planning
		Efficiency
		Managing the transition
		Redundancies
		IT in the UK
		Evaluation of change
		Outlook
	The new system	Quality
		Using the new system
		MACH
		Everyday procedures
		Flexibility
Resistance and learning	Resistance	Shock
		Uncertainty
		Anxiousness
		Expectations
		Change attitude
		Resistance
	Learning	Learning from resistance
		Training
		Experts
		Formalization of knowledge
		Feedback
		Individual learning
		Group learning
		Learning lost
		Lessons learned
Communication	Communication	Communication within UK
		Communication with headquarters

Figure 3.3: Top-down interview coding frame

Coding Process

5.
Partitioning into 3 subgroups of respondents (UK managers, UK employees, German managers). Analysis of content of thematic codes for each subgroup and extraction of **main common themes** (fifth reading).

6.
Summarizing of main common themes into **categories** to guide the presentation of results.

Coding Frame
(see Appendix F and G for full coding frame)

Thematic codes (n=37)	Main common themes (separate for 3 groups; example shows only UK managers)	Categories
Job description Demographics Commitment	▪ We're doing a good job in the UK	▪ UK is doing fine
System integration Germany vs. UK ...	▪ This diminishes what we've had independently in the UK ▪ ...	▪ Decreased independence ▪ Centralized organization
Concerns Prior implementations Planning ...	▪ Has this change been catered to our needs at all? ▪ ...	▪ A change prescribed from headquarters ▪ A difficult project ▪ Success imperative ▪ Further layoffs?
Quality Using the new system ...	▪ The new system is an improvement, but it is monumental and complex ▪ ...	▪ Progress ▪ One size fits all
Shock Uncertainty Anxiousness ...	▪ When the news broke about the changes, that was a shock to everyone ▪ ...	▪ Insecurity ▪ Resistance is futile
Learning from resistance Training Experts ...	▪ We sold SAP particularly well to our people ▪ ...	▪ Selling SAP ▪ Insufficient training ▪ Random formalization ▪ Responsiveness to feedback ▪ Learning by doing ▪ Honesty, cohesiveness, and lost learning
Communication within UK ...	▪ We tried to be open with people and kept our staff informed ▪ ...	▪ Changing through communication

Figure 3.4: Bottom-up interview coding frame

The devised coding frame needs to a have adequate reliability in order generate consistent results across coders. Reliability in the context of experimental science is defined as the consistency of measurement. The concept has been discussed earlier in this chapter. In the context of qualitative data and the coding thereof this quality criterion has some specific connotations that differ from its descriptions in classical test theory. Here, reliability is essentially the agreement among interpreters (Bauer, 2000), which then requires some duplication of effort to obtain an indicator of consistency for the same coding procedure across individual coders. Hence, the reliability of a coding system is a question of coder training, clear definition of individual codes, the complexity of the entire coding frame, and of the given material.

Considering the latter, Krippendorff (1980, p. 130) notes that reliability often gets into the way of validity, because researchers have a tendency to improve that quality of data that is most easily measurable, given the difficulties of systematically analyzing complex symbolic forms. Instead of striving for valid analyses that truly capture the latency and proper meaning in multifarious material, the analytic process is often reduced to easily accountable strategies, such as frequency counting, to serve the reliability criterion. If, for example, a research study sought to deconstruct the motifs of a certain class of modern poems by counting words, the results might be reliable, but the validity of such counts must be deemed dubious.

Since coder training seems to be the key to increasing reliability, where a given coefficient represents the state of the training process, it can be argued that reliability is a process to be optimized rather than maximized (Bauer, 1993, p. 300). The complexity of a coding frame has to match the complexity of the data to produce valid results. But more complex coding frames require increasing amounts of coder training to be utilized with high reliability. Natural limits are set by the imperative for underlying theory to be parsimonious and for generated results to be a succinct summary of the original data. Optimizing reliability through an adequately complex coding system that is comprehensible within a reasonable amount of time and effort may therefore be the best strategy. In addition, procedural transparency is the key to any assessment of quality and consistency.

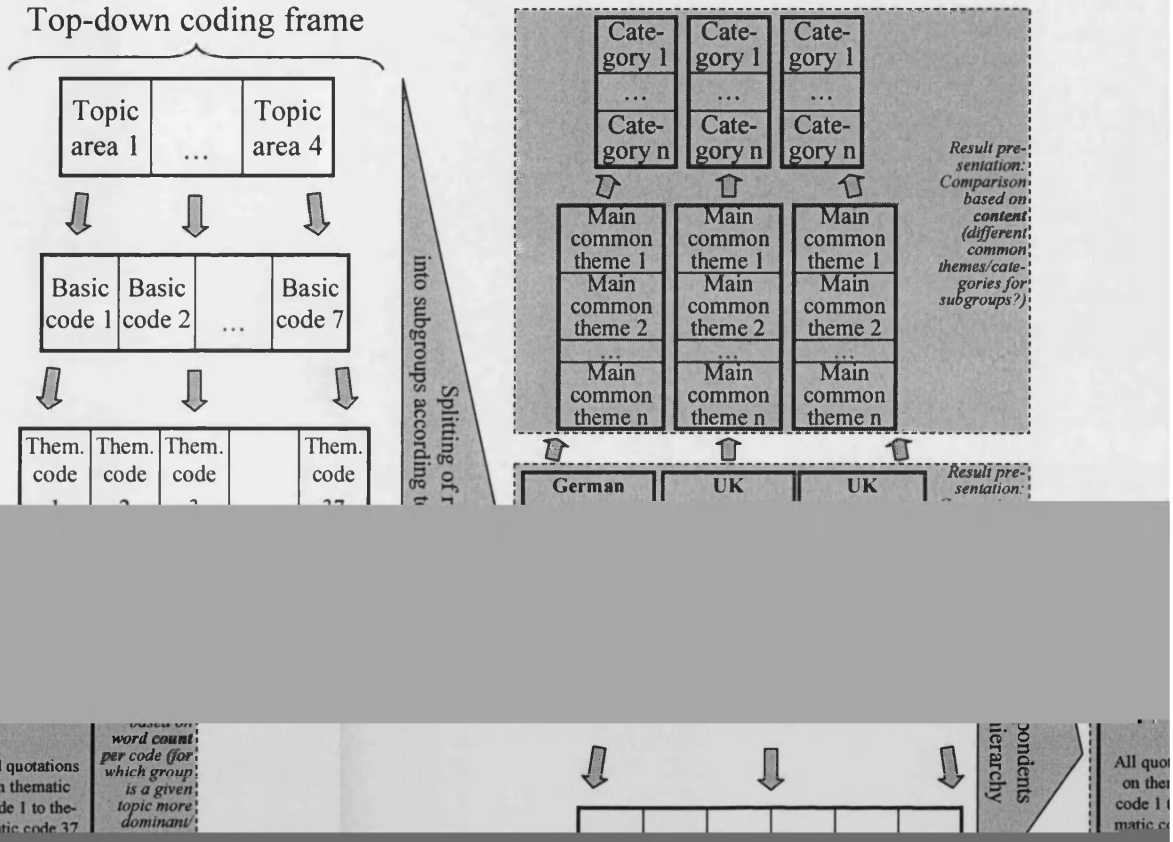
In the present case, the assessment of reliability differed for the top-down and the bottom-up coding frames, because the former centers on assigning codes to quotations and the latter consists of extracting common meaning from quotations with the same code. Standard inter-coder reliability was calculated for the top-down coding frame. Af-

ter the entire textual material was coded (steps 1-4 in *Figure 3.3*), a second coder who was blind to the research question and underlying theory was thoroughly familiarized with the coding procedure and the 37 thematic codes, and encouraged to use the top-down interview coding frame in Appendix F as a source of information. The second coder then coded two randomly selected interviews. Each answer by a respondent in the text was treated as a separate unit for which assignments of codes were compared. As in the original coding, it was possible to assign multiple codes to the same textual units. Cohen's Kappa (Cohen, 1960) was calculated to indicate inter-coder reliability, to a value of $\kappa = .77$, which is acceptable for exploratory research (Krippendorff, 1980).

For the bottom-up coding frame, an intra-coder reliability check was chosen. Since extraction and summary of meaning are central to this part of the analysis, familiarity with the research question and setting takes precedent over neutral abridgement of coded material (LeCompte & Goetz, 2001). Moreover, some quotes were retained as main common themes because of their uniqueness and explanatory power, not because of the frequency of their appearance across respondents. Hence, reproducibility across coders was substituted by within-coder stability. Two months after the first extraction of main common themes, the coded interviews were examined again code-by-code for each subgroup of respondents (this is essentially a sixth reading of the interview material; see *Figure 3.3* and *Figure 3.4* with the coding procedures). The thus produced main common themes were compared with those generated during the first extraction. In cases where incongruencies consisted of more than simple wording differences, the particular code for the particular subgroup was revisited to ensure consistency of meaning and adequate summary by the relevant main common theme. With this the reliability testing of the coding frame was completed.

The presentations of results from the interviews data will essentially be split into two parts. In the first part, the results of the top-down coding are assessed for their size, that is, the average word counts per code for three subgroups of respondents (UK managers, German managers, UK employees) are compared. This allows for an initial scanning about the significance of particular topics, and creates an understanding about the salience and importance of certain issues for the respective subgroups. In the second and main part, which will be spread across different sections, the content of respondents' answers is analyzed by means of a comparison of main common themes between sub-

groups. *Figure 3.5* shows the two parts of the result presentation along the coding frames in a graphic format.



individuals' person

A repertory grid is an analysis tool employed to understand

resistance has mainly negative connotations and has a strong association with deficit concepts. He used free associations and semantic differentials to generate his results. While free associations might simply elicit respondents' espoused theories, the semantic differential method provides predetermined adjectives along which a given concept can be rated. In this way, however, the researcher might impose his/her own dimensionality of understanding of the given concept on the respondent. In the present study, the repertory grid method was consciously chosen to overcome these potential shortcomings, as explained in the following.

The repertory grid method was developed by Kelly (1955) to appraise the process of construing, and constitutes the core empirical instrument of his personal construct theory. While rejecting the stimulus-response model, personal construct theory attempts to elucidate the structure of assumptions people use to ascribe meaning to their experience (Bannister & Mair, 1968; Ginsberg, 1990; Neimeyer & Neimeyer, 1982). Experience in this context is not simply seen as a sequence of stimuli, but as "the cycle of framing personal interpretations of the world and reassessing them in light of ensuing events" (Neimeyer & Neimeyer, 1982, p. 190). Kelly (1955) describes the themes people deduct from their experiences as constructs, which are construed through a process of contrast and similarity. He retains the fundamental notion that constructs are bipolar. In this view, people make sense of their world by simultaneously noting likeness and difference. For example, if a respondent describes 'discussions with management' as a 'constructive' form of resistance, she indicates at the same time that such discussions are not destructive. The construal is understood as a discrimination process that stretches across many levels of awareness, from intuitive thought to verbal reasoning, from physiological impulse to emotional sensation (Marsden & Littler, 2000). Hence, construing resistance to change as a potential source of learning or as a deficit concept may represent more than change participants' cognitive recognition; it may reflect an impassioned premonition that has profound implications for the emotional and behavioural aspects of the treatment of resistance.

Originally developed in clinical settings, the repertory grid has gained popularity in the last two decades in studies of managerial and organizational phenomena, such as strategic decision-making, information requirements analysis, performance appraisal, recruitment, consumer relations, training evaluation, and risk analysis (Cassell, Close, Duberley, & Johnson, 2000; Gammack & Stephens, 1994; Wacker, 1981; Walton, 1986). The technique was developed in order to overcome the shortcoming of imposing

the researcher's frame of reference and worldview on subjects, as is the case in structured surveys. Open-ended surveys would to some extent remedy this shortcoming, but cannot resolve the problem of the subconscious nature of people's cognitive organizing, which impedes valid and reliable answers to direct, open-ended questions (Reger, 1990). The repertory grid provides a set of subjective coordinates that locate respondents' discriminations among a set of environmental phenomena, in our case manifestations of resistance to change. In investigating cognition, the repertory grid offers three important advantages (Brown, 1992; Ginsberg, 1989): Firstly, it is designed to elicit meanings to the respondents. The researcher's inherent preconceptions are not imposed upon the subject. Secondly, due to the absence of direct, unstructured questions to participants, the technique has great potential to uncover theories-in-use that actually govern behavior rather than espoused theories. Thirdly, resulting data illustrates not only the qualitative nature of subjects' belief systems, but the data can also be analyzed through statistical methods, allowing for reproduction and validation.

The four basic steps in administering a repertory grid are element selection, element comparison, element evaluation, and the grid analysis. The combined duration per individual is approximately 45 minutes, for a group around 60 minutes, depending on the size of the group. As indicated in earlier sections, in this study the repertory grid was administered to groups of managers and employees.

In the first step, elements are selected to which participants respond. The selection can be undertaken either by the researcher or by the respondent. In our case, respondents were asked to name different manifestations of resistance to change that they could think of (e.g. discussions with managers, threats to leave).

In the second step, elements are randomly divided into sets of three (other methods than the triadic one are also possible) and respondents are asked to name a construct, that is a dimension, along which two of these elements are similar and different from the third. In this way, a likeness pole and a contrast pole are found. Examples of elicited constructs concerning different manifestations of resistance were 'irrational vs. rational' or 'destructive vs. constructive'. This process is repeated until a substantive yet manageable pool of constructs is generated. The result of the first two steps is a blank matrix with elements as columns and constructs as rows.

In the third step, respondents are then asked to rate on a scale every element in relation to the elicited constructs. In our case, respondents would rate elements on a 7-

point scale, with 1 and 7 indicating the two antipodes (e.g., destructive = 1, constructive = 7). The same rating could be given to more than one element.

Finally, the resulting data matrix of m × n elements and constructs can be analyzed to create a geometric, quantitative, or qualitative representation of respondents' frames of reference. Content and structure of a grid may be discussed qualitatively or analyzed quantitatively by calculating various indicators such as cognitive complexity, construct significance, or element distance (Fransella & Bannister, 1977; Ginsberg, 1989). In principle, any multivariate method grounded in matrix algebra can be employed for further analysis, but the most useful types are cluster analysis, factor analysis, and multidimensional scaling (Bood, 1998; Easterby-Smith, Thorpe, & Holman, 1996; Reger, 1990). For the present study, principal components factor analysis was chosen. Results can be compared between individuals or groups, and within individuals or groups over time.

Following the semi-structured interviews, the repertory grid addressed and elicited respondents' group level cognitive construction systems specific to resistance to change. The interview provided a flexible method to raise awareness about the dynamics of the focal topic. Once made salient, the structure of assumptions about resistance to change was systematically assessed by the repertory grid technique[22]. The technique was administered at the UK site to two groups of British employees with three and two participants, respectively, and at the Mitterwald headquarters offices to a group of German managers with two participants for a total of three repertory grids. It was planned to also have a group of three British managers take part, but they declined cooperation in the initial stages of the procedure (see section 3.3.5). All participants had been interviewed a few days prior to the repertory grid sessions. A paper-based version was used involving a large flipchart sheet and yellow PostIt notes to write down and arrange elements and constructs. The sessions started with a brief general introduction of the method followed by an explanation that the topic of interest would be resistance to change. As resistance was mostly negated during the previous interviews, respondents were asked to relate their answers not exclusively to the change project, but to their general experience in the workplace or their imagination (e.g. "how could resistance to change manifest

[22] A similar approach of raising respondents' awareness for, and familiarity with, focal topics prior to the application of the repertory grid was employed and recommended by Kristof-Brown (2000).

itself in a work situation?"). Given the delicate nature and negative connotations that surround the topic of resistance, in the introduction I chose not to explicitly relate the topic to employees' personal experience during the change project. The number of elicited elements and constructs had to be limited for reasons of available time and people's attention, since the sessions were not to exceed one hour and since the method can easily become lengthy and cumbersome for larger matrices. Hence, the number of elements or constructs for any group was restricted by the researcher to range between eight and ten. Participants were actively encouraged to discuss and negotiate elements, constructs, and ratings. The experience revealed that the method would be impractical for groups of more than three to four participants, because of the increasing length of discussions, the difficulty of reaching consensus, and the required close proximity in the seating arrangement. All verbal interaction was tape recorded and transcribed for further analysis.

3.4.5 Repertory grid analysis

The repertory grids analyzed in this section were conducted with two groups of British employees and a group of German managers. The objective behind the administration of this method was to reveal respondents' perceptions of resistance to change and the frames of reference they use to make sense of the concept. A detailed analysis of the referential frameworks obtained has the potential to characterize resistance as change agents and change recipients understand it, and thereby to extrapolate about the role of resistance within the organizational culture. This will complement the findings on awareness of resistance obtained in the interviews and project documentation. The distinction between groups of respondents as used in the interview analysis was also used for the application of repertory grids.

Repertory grids are somewhat deceptive sets of information because their format is very compact. However, in a grid with n elements and m constructs there are $[n + m * 2 + n * m]$ pieces of information to consider (Bell, 1988). For example, for a grid with nine elements and nine constructs, this results in 108 pieces of information.

The analysis of the obtained grids will be done as follows in three somewhat overlapping steps. All three steps will involve comparisons between groups. First, respondents' choice of elements and constructs will be assessed. An analysis of the produced element and construct labels will serve as an indicator of the valence of resistance to

change at R&P, for example in comparison to the whole range of possible manifestations of resistance to change. So far this is a purely semantic task. The second step will be to examine how elements relate to one another and constructs relate to one another separately. By considering respondents' ratings, descriptive statistics such as means, skewness coefficients, and correlations are evaluated. In the third step, principal components analysis (PCA) is employed to jointly explore how elements and constructs relate to one another.

The literature on repertory grids discusses many indices and analytical techniques to illustrate and determine the internal structure of a grid (Bell, 1988, 1990, 2000; Fransella & Bannister, 1977; Ginsberg, 1989). Such measures summarize the information found in the raw data or correlation matrices based on different algorithms, or provide different forms of graphical outputs. However, these alternative measures mostly reflect a researcher's personal preference and add little value above and beyond the basic semantic, descriptive, and correlational analyses proposed here. For example, multidimensional scaling might be used as a substitute for factor analysis, although this essentially does not increase the explanatory power of the produced output. Jankowicz provides a constructive and detailed discussion of the practicality and usefulness of different analytical techniques (Jankowicz, 2003).

3.4.6 Project documentation collection

As a third method of data collection, an examination of formal documents about the change project was undertaken. The analysis of written organizational documentation provides insight into dynamics of learning and resistance above and beyond the findings generated by the other two methods. Formal documents are the product of information processing at the organizational level, and thereby reflect a process of formalization and legitimization that makes knowledge potentially accessible throughout the organization. Through formalization, documentation is made official and obtains an endorsement of status and value. This usually requires formal markers that distinguish organizational documentation from mere individual notes (Tschan, 1992). Such markers also identify sender and receiver within or outside organizational boundaries or along the organizational hierarchy.

The production of documentation involves simplification, compression, accentuation, and selection by an individual author. Hence, the production is naturally biased by

subjectivity and has to be judged by the motives of the author in a particular context (Bauer, 1993). Documentation is often centralized with a few information gate-keepers in control. Due to their potentially subjective and political contents, documents should never be taken at 'face-value', but instead be evaluated with a strong emphasis on contextualization and triangulation with other research data (Forster, 1994).

In addition to their role in the collective learning process, documents record the formal communication of organizational action, and therefore constitute a rich source of insight especially into project-related action where roles, tasks, and objectives need to be defined for a certain time period. Frequency counts can indicate the intensity of such communication over the course of a project, but should be used with caution, since rich documentation might either be an indicator of intense project activity, or bureaucratic structures, or both. In the opposite case, the relationship between little documentation and organizational performance should also be carefully assessed, as the production of documents might interfere with actual project tasks. From an analytical perspective, project documentation can easily provide more comprehensive coverage of the chronological order of events than interviews, for example. As a result, project documentation has great value in the reconstruction of organizational action as well as in the examination of respondents' interpretations.

Organizational documentation can include such forms as accounts of standard operating procedures, annual reports, PR material, mission statements, press releases, formal charters and legal documents, project outlines, project reports, memos, meeting minutes, internal correspondence etc. In principle, any of these forms is suitable for analysis, access and consent of the hosting organization provided. This points at one of the key advantages of the analysis of documentation, because the information is already collected and mostly independent of timing requirements of other techniques. However, for purposes of uncomplicated further inquiry and clarification with concerned individuals, a prompt analysis is recommended. In sum, the method is unobtrusive, largely non-reactive, and therefore inherently maintains ecological validity (March, Schulz, & Zhou, 2000).

Since the change project at R&P UK had a clearly defined time frame, set of objectives, and list of participants, the strategy for this data collection technique was an *exhaustive inclusion of all project-related documentation.* Two 'gate-keepers' were identified (Schmitdbauer and Franks), who provided access to formal, official project

documentation in either electronic or paper format. Informal written communication, such as emails or personal notes, was not obtained, because it was no longer available given the time passed. In addition, the focus of the inquiry lay on official documentation. Trying to assess the exhaustiveness of my set of documents, German management assured me on two occasions that they had given me everything that had been retained in the company archives. Documentation from the German project management was complemented by training documents from the British side. For obvious reasons it is hard to say whether the obtained set of documents reflects the full range and quantity of documentation about the change project. However, judging from the confined dimension of the project, the centralized storage of written project material, and participants' unfettered willingness to grant access, it seems safe to conclude that at least the vast majority of official project documentation was made available for analysis.

In addition to directly project-related material (meeting minutes, presentations of project structure and objectives, technical specifications), I also collected 12 issues of an employee information letter reflecting a time span from July 2001 to April 2003, R&P's 2002 annual report, an external auditor's report, and various documents related to the SAP trainings.

All documents were initially pooled and a selection was made on the basis of relevance for the research question and the topics of interest in order to exclude documents of a purely technology-related nature. The resulting subset was then subjected to a content analysis.

3.4.7 Project documentation analysis

The project documentation was analyzed with the purpose of assessing the formalization at the organizational level within the change project at R&P UK. While the organizational level is the main target of analysis, information pertaining to the individual and group level is also taken into account. The prior theoretical discussion established the project documentation as the formalized product of information processing at the organizational level. Of interest to the present document analysis is the general focus of the documentation as well as indicators and the treatment of learning and resistance. Findings obtained from the interviews and repertory grids provide comparative validation and serve as guideposts for the analysis.

Project documentation was collected in the form of electronic files and hardcopy. The obtained electronic files contained 117 documents. They were retrieved from the company's database server. This initial dataset included a majority of documents with purely technical content, such as system specifications, customer and price lists due to be changed during the project, and further details of customer accounts. Scanning for documentation irrelevant to the analysis, the original electronic dataset was purged of 91 technical files, arriving at a total of 26 documents retained for further analysis. For consistency purposes, the selection process was repeated a second time a few days later, resulting in the same number of relevant documents. As indicated in the previous section, in addition to the electronic project documentation I also collected 12 issues of an employee newsletter reflecting a time span from July 2001 to April 2003, R&P's 2002 annual report, an external auditor's report, and a large document related to the SAP trainings. *Table 3.3* below shows the sources of project documentation data, the inclusion ratio for further examination, and the total of analyzed material. All in all, *28 documents* were subjected to systematic analysis.

As indicated in section 3.4.3 on the interview coding procedure, the following section on the analysis of the project documentation to a large degree relies on the systematicity and logic developed for the examination of interview data. Hence, the procedural discussion here will be rather brief in comparison.

The project documentation data are textual material and require a content analytical approach involving a rigorous coding procedure. The initial strategy for the documentation analysis was to use the coding frame developed for the interviews, because of its comprehensive coverage of issues related to the research question, such as group learning and resistance. The interview coding frame was first built through open coding, and subsequently expanded and modified to systematize issues emerging from the data and issues specified by the prior theoretical discussion. Since the interview coding frame covered at least all theoretically relevant topics, it seemed appropriate to utilize the same instrument for the documentation analysis.

However, initial coding trials produced largely blank frequency tables, indicating that many interview codes were not applicable to the document data. It became apparent that topics related to learning and resistance were hardly considered in the formalization effort. As a result, for many relevant topics a modified analytical strategy would require coding for *absences*. Yet such a strategy might easily produce a flawed argument, since

theoretically, out of the universe of possible topics, almost everything is absent from any given text, except the few specific topics it is written on. Content analysis tends to center on frequency, and thus potentially neglects the rare and the absent (Bauer, 2000). A true reason for an observed absence of certain topics in the data might also be simply an inadequate extraction tool, that is a suboptimal coding frame. Therefore, in order to build a cogent argument, I have to reliably verify any suspected absence of content relevant to the research question. This will be done by comprehensively and exhaustively accounting for the purpose and content of the obtained documents. On the basis of demonstrating what information *is* in the documents a strong case can be made about what *is not* in them.

Table 3.3: Project documentation data

						Total
Source	Project documentation in electronic format	External auditor's report	UK employee newsletter	Shareholder report	Training document	n/a
Date of production	Known	Known*	Known*	Known*	Unknown	n/a
Amount	117	1	12	1	1	132
Amount relevant and coded	26	1	1	0	0	28
Nature of coded documents	Complete project documentation (all meeting minutes, timeline charts, task responsibility charts, to do lists, specific training documentation, flow charts of document trails, project structuring, evaluation of project alternatives etc.)	List of observations and recommendations concerning the SAP implementation and warehouse closure	Article on introduction of SAP in the British subsidiary	n/a	n/a	n/a
Size of coded documents	7186 words + 112 pages**	198 words	307 words	n/a	n/a	7691 words + 112 pages**

* not included in the timeline analysis of frequency of document production (the newsletter appears every month, the auditor's report was retrospective a year after the project, and the shareholder report appears every year)

** words were counted for text-based documents in MS Word format, pages were counted for slide or spreadsheet based documents in MS Power Point or MS Excel format

The coding was conducted as follows. Essentially, interview codes applicable to the documents were retained, and new codes were generated that are exclusive to the project documentation. The partitioning into subgroups of respondents, as done in the interviews, was irrelevant for the documentation, because the vast majority of documents originated from headquarters. Both the application of existing codes and the development of new ones were undertaken according to the procedure described in *Figure 3.3* and *Figure 3.4* in the section on interviews (pp. 146 and 147), involving a top-down and a bottom-up coding process.

For existing codes, the first step was replaced by a test of adequacy for every interview code to the document data. After a second reading, a list of 13 retained codes was generated. Step 2 was omitted, because of the already existing allocation of thematic codes to basic codes. A test of coherence followed as step 3. Step 4 does not need to be repeated for existing codes. Step 5, the extraction of main common themes, was done without the partitioning of the entire document set into subgroups. Summarizing the common themes into thematic categories, step 6, completed the coding with existing codes.

For new codes, the first three steps were undertaken to arrive at a coherent set of thematic and basic codes. Step 4 was omitted, since the previously existing codes already account for the theoretical background. The extraction of main common themes, step 5, was again done for the entire collection of documents, and the aggregation into thematic categories, step 6, finalized the coding.

The complete top-down document coding frame can be found in Appendix J, while the coding frame showing main common themes and thematic categories as well is shown in Appendix K. For better illustration, *Figure 3.6* below shows the codes applied to both interview and documentation data, and the codes exclusive to the respective data sets. The document coding frame contains 30 thematic codes. A frequency table showing occurrences of thematic codes across documents is included in Appendix L. A total of 1143 quotations from the documents were assigned to thematic codes.

The reliability of the document coding frame was assessed according to the same procedure as for the interview coding frame (see section 3.4.3). Again, the focus of the reliability assessment lay on the top-down coding frame only (steps 1-4 in *Figure 3.3*, p. 146). A second coder, blind to the research question and underlying theory, was familiarized with the 30 thematic codes and asked to code two randomly selected documents. Cohen's Kappa was calculated to a value of $\kappa = .79$ for inter-coder reliability, indicating

adequate reliability (Cohen, 1960; Krippendorff, 1980). Intra-coder reliability was ascertained for the bottom-up coding frame (steps 4-5 in *Figure 3.4*, p. 147) by means of a second extraction of main common themes two months after the first one. A comparison of the results of the two extractions and minor modifications to ensure consistency completed the reliability testing.

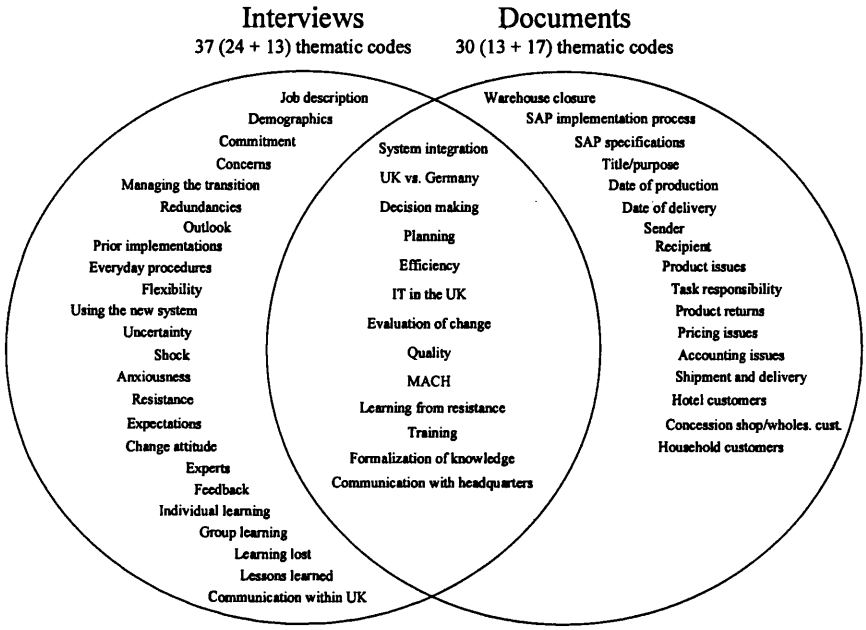


Figure 3.6: Thematic codes for interview and documentation data

3.5 SUMMARY

The third chapter contained a detailed description and discussion of the methodology employed for the empirical part of this thesis. The research strategy, the setting of the study, and the methods of data collection and analysis were explained.

Following the formulation of a research question at the end of the second chapter, the purpose of the present empirical study was outlined as theory building on the topics of organizational learning and resistance to change. Specifically, the potential of resistance to change to function as a source of organizational learning was defined as the focus of empirical enquiry. It was decided to assess this potential by means of an analysis of an organizational change in a field setting.

The choice of methods was subject to two considerations. On the one hand, adequate methodological fit was required in respect to the elements of the research question and the processes depicted in the proposed model of organizational learning. Hence, any chosen methods needed to be appropriate for the detection of individual cognition, group communication, and organizational formalization as well as for the examination of emergences of resistance. On the other hand, the methods had to be adaptable to the specifics of a particular field setting, which required a degree of flexibility in the application of the data collection. As a result, I chose personal interviews, repertory grids, and the collection of organizational documentation. Interviews and document collection focus on the reconstruction of the change project, and the exploration of individual cognition and organizational formalization related to learning and resistance in the project. Repertory grids specifically target the group level perceptions of resistance to change among project participants. Each method has the potential to gather information about more than one level of analysis, while the tripartite approach allows for triangulation of results.

The research strategy used here in a theory building, exploratory approach is a single case study of an organizational change project. This is a non-experimental field study, which employs an embedded design with three levels of analysis. Quality criteria such as validity and reliability were discussed, and the measures taken to ensure an appropriate standard were outlined.

Rousseau & Paul, a global ceramics manufacturer headquartered in Germany was the organization under study. The specific focus lay on an implementation of SAP software in conjunction with a warehouse closure at R&P's British subsidiary. In order to cater for the particular context, a general definition of resistance provided earlier was refined to a working definition of resistance as non-acceptance of the change measures. For this retrospective project analysis, I conducted interviews and repertory grids with German and British managers and employees and collected the complete project documentation.

In the remaining part of the third chapter, the employed methods were introduced in detail and the specifics of data collection and analysis were discussed. Three methods of data collection required three different types of analytical techniques. For large parts of the analysis, especially on the interviews, the data pool was also split into three parts according to group membership of study participants. This enabled the comparison between responses from German managers, UK managers, and UK employees.

For the interview analysis, a systematic coding procedure was devised. The resulting coding frame, which was applied to all interview transcripts, accounted for emergent topics as well as topics previously determined by the theoretical discussion and the research question. The generated codes were then utilized for the extraction of main common themes and categories across respondents, which will facilitate the presentation of results.

Repertory grid analyses comprised first of all a group level semantic assessment of respondents' choices of elements and constructs. In a second step, the relationships among elements and among constructs were considered separately. In a third step, principal components analyses were used to explore how the combined elements and constructs relate to one another.

The analysis of project documentation largely followed the procedure outlined for the interview analysis. A separate coding frame was developed that contained codes shared with the interview data and codes exclusive to the document material. This new coding frame was then applied to all relevant project documentation. Finally, as in the case of the interview analysis, main common themes and categories were extracted.

4 RESULTS

The presentation of results consists of five main sections. First of all, result characteristics pertaining to the interview and document data are presented. The following four sections then correspond to the variables identified in *Figure 2.2* (p. 110) on the research focus. These variables are resistance, contextual influences, awareness, and learning. Accordingly, an outline of the independent variable of resistance in the change project is provided in the second part. Third, the context of the change project is described, including the nature of the project itself, organizational relations, information about participants, and the characteristics of the new system. Finally, in the fourth and fifth part, data on awareness and learning are shown. These last two sections distinguish between individual, group, and organizational level results. Findings on awareness of resistance are related to the factors existence, intensity, and semantic elaboration (see *Table 3.2*, p. 138). Findings on learning reveal to what extent resistance and awareness were used as a source of learning, and to what extent the found learning processes correspond to those described in the integrated framework of organizational learning.

4.1 RESULT CHARACTERISTICS

As an entry into the result presentation, in this first section characteristics of the interview and documentation findings are shown. Due to the complexity of the developed analytical procedure for those two sources, it is necessary to illustrate several further aspects of the resulting data in addition to the actual coded content presented later. As the repertory grid method is a fairly standardized procedure, the results on that method do not need specific further characterization here.

For the interview material a word count per code was undertaken to give an idea of the comparative dominance or absence of topics from the perspective of the respondents. Interview transcripts constitute the majority of the combined data corpus and contain information on all facets of the research focus. The logic of the interview results presentation was illustrated in *Figure 3.5*. The word counts will be shown in the next section, while the coded content is spread across several subchapters specific to the focal variables. For the documentation, the frequency of production for the time span of the project was examined. In addition, the direction of formalized communication was

inspected as well as the general nature of the document content. The coded document content will also be split into several parts and presented in the relevant sections further below.

4.1.1 Interview response distribution

The comparative word count provides information about the weight of identified topics[23] for the three subgroups of UK managers, German managers, and UK employees. *Figure 4.1* and *Figure 4.2* show the word counts[24] across thematic codes for the three subgroups, first as stacked columns displaying the cumulative totals for every thematic code (*Figure 4.1*), and second as lines with markers better illustrating differences between subgroups (*Figure 4.2*). In both diagrams gaps between codes demarcate basic codes, that is clusters of thematic codes (see Appendix F). The two basic codes on learning and communication are paired here because they will be presented as a single content unit in the following sections.

It is clear that the word count results are confounded by the demarcation of codes and by code specificity. In addition, because semi-structured interviews were used for the data collection, the lengthiness or brevity of responses is also confounded by the interview topic guide and the questioning of the interviewer. In the case of, for example, narrative interviews, the elaborateness about a topic could be a stronger indicator of significance, but at the same time it would be unlikely that all issues of interest to the research question are covered. A second confounding aspect is the fact that certain topics are only relevant to certain subgroups because of differing job roles and responsibilities. The thematic code 'planning' (of the change project), for example, will have seemingly little relevance to UK employees, since planning is an essentially managerial task. However, discovered brevity on a topic that should be germane to a given subgroup might have profound revelatory value. In sum, the word count should simply be understood as a first indicator of the nature of results that provides an idea about the structure of findings and about emphases in respondents' reconstructions.

[23] The terms code, thematic code, and topic are used interchangeably, because they stand for the same level of meaning unit in the top-down interview coding frame (Appendix F)

[24] In all cases of displayed word counts, the data are adjusted for different group sizes, that is, total amounts were divided by the number of respective group members (German management = 4; UK management = 5; UK employees = 9).

In the following, I first undertake an initial examination of positive outliers, that is, dominant topics. In a second step, intergroup differences on codes are assessed. Lastly, attention is focused on found absences, that is, very small word counts on certain codes for a given subgroup.

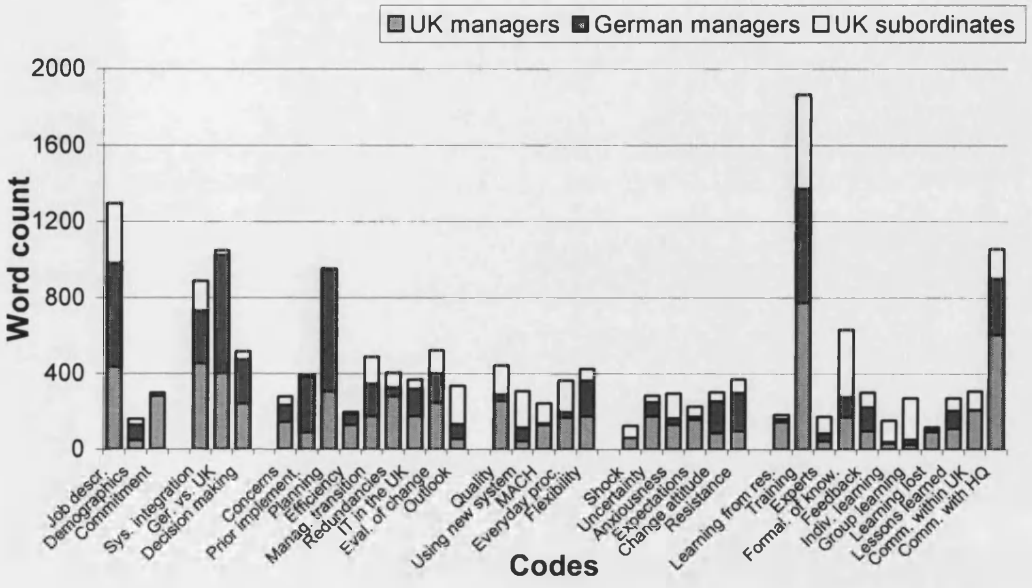


Figure 4.1: Cumulative word counts across codes

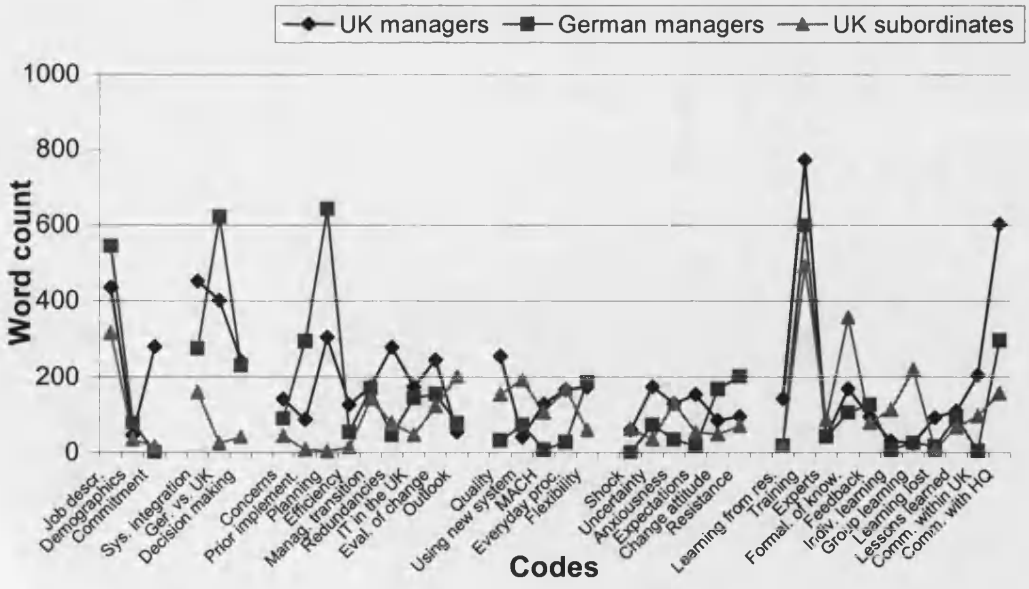


Figure 4.2: Word counts across codes for three subgroups

The comparative dominance of topics is best illustrated in *Figure 4.1*, where cumulative word counts across codes can be found. The mean word count per subgroup and code is $m = 454$ with a standard deviation of $s = 370$. Applying the rule that any thematic code with a word count of more than one standard deviation above the mean is an outlier, 'job description', 'system integration', 'UK vs. Germany', 'planning', 'training', and 'communication with headquarters' are identified as dominant topics, accounting for 42 percent of the combined total word count for all codes. There are no downward outliers.

As a function of the complexity of a large organization, it can be assumed that job descriptions are somewhat extensive, even at the level of a customer service operator. The description involves an account of all the daily tasks and explanation on standard and non-standard operating procedures for the specific job environment. In addition, the question "What is your job description?" or "What do you do in your job on an average day?" was always asked to start the interview, to encourage narration and to make respondents feel comfortable as a subject of study. The 'system integration' as the core of the change project received much attention seemingly because it is the key issue of the entire change endeavor. The rationale behind introducing a company-wide computer system in the UK was just this system integration between the British subsidiary and headquarters in Germany. The weight of the two codes 'UK versus Germany' and 'communication with headquarters' indicates the importance of the relationship between organizational units in this project. Spanning the geographic divide is apparently not only a salient topic in terms of the actual communicative act, but also includes an evaluative aspect about the differences in location and culture. This emphasis on organizational relations between countries far exceeds the size of remarks about internal relations or communication within the subsidiary. 'Planning' the change is also a topic that respondents elaborate on, and it is interesting to note that planning apparently takes up much more space than the evaluation of the change. From a learning perspective, a reflective assessment of the change with hindsight was potentially neglected, while preparatory considerations were taken seriously. This could be an indicator of an incomplete learning cycle or of a tendency to be inattentive to possible sources of learning and insight. The most obvious outlier, exceeding the mean by more than three standard deviations, is the code 'training'. None of the topics under the basic code 'the new system' receive that much attention. 'Using the new system' generates only fleeting interest in comparison. Therefore it can be assumed that the training appears to be the key entry

point into the change, as it introduces recipients to the new system and provides a kind of test run for new operational procedures. Becoming acquainted with SAP and thereby having the chance to assess the system for its efficiency and quality from a user perspective probably makes the training a decisive phase during the change. Independent of system characteristics, it can also be assumed that the acceptance of the change would be strongly influenced by the way the training was conducted. Whether this was done as a pro forma exercise or with genuine concern for the end user and local circumstances might have important consequences for potential emergences of resistance.

The combined word counts presented so far convey a more informative message if the differences between subgroups are considered, which can be assessed more easily in *Figure 4.2*. Percentages are not calculated, as they are not meaningful in cases of small combined word counts. In general, the largest differences are found for those codes that also combine the largest word counts.

While the degree of elaboration rises along the hierarchical levels for the code 'job description', an expression of 'commitment' to the job appears most important to UK managers. This might reflect their intermediate position in the hierarchical chain, although it is unclear why UK employees were apparently not motivated to express commitment. Since expressions of commitment are rather peripheral to the issues raised during the interviews, their exact content nature will have to be explored in a later section. The topics in the organizational relations cluster[25] seem to hold more relevance to the management level. It might be suspected that employees are not involved in the decision making process. German managers spent more time on differences between organizational units, while British managers highlight the system integration aspect. The cluster for the basic code 'the project' immediately reveals a striking difference for the code 'planning'. Again confined to the managerial level, the great majority of remarks on this topic stems from management in Germany. This finding could either reflect the simple nature of a project that was initiated at headquarters, or describes a pronounced hierarchical structure for the company's operations. German managers obviously hold more knowledge about 'prior implementations', since they were directly involved in managing those, and they express this familiarity in the interviews. 'Redundancies'

[25] The term cluster refers to basic codes that each contain a number of thematic codes in the hierarchical top-down interview coding frame (Appendix F).

seem to matter most to UK management, and surprisingly much less to UK employees, although the difference in absolute terms is rather slight. The same comparatively small differences in absolute terms can be found in the 'new system' cluster. Both management groups appear rather reticent concerning evaluations of the change project, which contrasts their observed emphasis on the planning of the change. Comments about the old 'MACH' system and changes to 'everyday procedures' under the new system are dominated by the two British groups, by nature of their direct exposure to these issues. Differences in the 'resistance' cluster are quite small, as is the overall weight given to the topic. One assumption based on the word count would be that resistance was not a major factor in the reconstruction of the project, or alternatively that it was not openly discussed. 'Uncertainty' and 'anxiousness' pertain clearly more to the British subsidiary. 'Resistance' itself receives more attention from the German side, while resistance as a source of learning prevails in the UK managers' responses. Again, the marginal differences in absolute terms make a meaningful comparison difficult here. The next cluster 'learning' starts with a sharp increase for the code 'training', a topic that was highly salient for all three groups, but mostly so for UK managers. Without knowledge about the content of remarks, however, possible reasons for the intergroup differences remain uncertain or at least speculative. 'Formalization' and 'group learning' seem to occur more in the realm of employees. Finally, UK managers made the comparatively largest contribution to the word count on the code 'communication with headquarters'

The third step of the word count analysis concentrates on those cases in which a particular subgroup had very little to say about given topics. UK employees are found to have generated a number of such absences. The low word counts on the codes 'prior implementations', 'planning', and 'efficiency' might clearly be attributable to employees' job roles, task responsibilities or level in the hierarchy. The low count on 'learning lost' and 'learning from resistance' might simply reflect the generally low word count on those two codes. Hence, the only meaningful absence appears to be for the code 'commitment', where the obtained difference between managers and employees in the UK is surprising. For UK managers, no substantive absences can be found. There are low word counts on the codes 'evaluation of change', 'using the new system', 'experts', 'individual learning', and 'group learning', but they are either attributable to job roles or are shared with one of the two other groups. For no single code do UK managers have a substantially lower word count than both other groups. The third group, German man-

agers, equally shows most of its low word counts on codes that are rather irrelevant to respective job or project roles. 'MACH', 'shock', 'expectations', and 'communication within UK' can be disregarded because of this. 'Learning lost' and 'individual learning' have very low combined word counts. Therefore, as for UK employees, only the low count on 'commitment' remains substantial.

Recapitulating the word count findings, the main observations for the three subgroups can be summarized.

First, commitment to the job appears to be of importance exclusively to the UK management. Due to the nature of the project, which was initiated at headquarters in Germany and required only the UK subsidiary to change, it is intuitively plausible that the German management did not feel any motivation to express its level of commitment. Operations in Germany were not an object of inquiry, and it must be assumed that German managers did not understand the research study as including an assessment of their own project performance and behavior. The research study was endorsed by a German managing director, who instructed his lower level colleagues in Britain to participate. Combined with the fact that the researcher was possibly perceived to have been sent from headquarters, UK managers might have felt a much more direct exigency to articulate their motives, as their own past activities were put in the spotlight. This rationale, however, would require UK employees to be vocal about their degree of commitment as well; something that they were not. Another potential explanation might be found in UK managers' middle role in the project, mediating between the two other groups. Such an intermediate role, in the project as well as in the hierarchy, may have caused higher pressure levels, because UK managers were obliged to both endorse decisions from headquarters and at the same time empathize with possible concerns from their employees. Clarification on the commitment finding will have to be sought in the analysis of interview content.

Second, the relationship between German headquarters and British subsidiary receives much attention, with the codes 'UK versus Germany' and 'communication with headquarters' accounting for 12,5 percent of the combined total word count. The prominence of intra-organizational relations is almost exclusive to the managerial level. Since managers on both sides were the main interacting groups, this topic is apparently more salient to them, while UK employees' interactions are largely confined to the environment of the subsidiary. It can be assumed that the nature of the transnational relation-

ship, presumably including such issues as cultural differences, language barriers, and different operating standards, might have been a critical factor in the project. The quality of the transnational relationship must be expected to exert a strong, if even causal, influence on dynamics of resistance and learning.

Third, respondents were much more vocal about the planning of the project than about its evaluation. While the code 'planning' is exclusively dominated by managerial remarks, as expected because of their job roles, the code 'evaluation of change' consists largely of employees' responses. The managerial contribution to the evaluation topic is seven times smaller than their discussion of the project planning. It can be suspected that the planning of a project is deemed more important than the evaluation thereof, or that retrospective evaluation is simply not understood as an integral part of an implementation project. The latter assumption, however, would be surprising, since the SAP implementation project in the UK was one in a series of similar efforts, and was going to be followed by SAP implementations in other national subsidiaries. Retrospective assessment of performance is an essential part of learning at any level of analysis, and a disregard for such an important source of information might seriously impede the potential for organizational learning to occur. In addition, a found possible inattentiveness for a comparably uncontroversial source of information, such as prior performance, will cause doubts to emerge about the ability to use resistance as a learning stimulus within the same setting. If project evaluation as the most obvious source of learning at the managerial level was not taken seriously, it can be assumed that learning did not rank high among the project's priorities.

Fourth, in line with the assumptions about learning, resistance to change does not seem to have been an issue of great concern in the reconstruction of the project. There are no positive outliers for the six codes of the resistance cluster, and 19 out of the 21 word count averages for the three subgroups lie below the total average, with the remaining two barely above. Given such figures, the question arises whether resistance did not surface in the interviews, that is, whether there was no awareness, or whether there was simply no resistance. In the first case, the inquiry will have to concentrate on potential obstacles to the emergence of awareness and to voicing accounts of resistance retrospectively. In the second case, the focus will have to lie on obstacles to expressing resistance *during* the project. Resistance being the stimulus variable, the initial low word count observation will have to be explored further.

4.1.2 Document production frequency and content issues

This initial examination of the frequency of document production over the time span of the project provides an indicator of the intensity of the formalization efforts up to and beyond the 'going live' date in February 2001. *Figure 4.3* shows the frequency of documentation production over time for all documents. Only material specific to the change project was included. A distinction is made between documents relevant for closer analysis and nonessential pieces of documentation (see *Table 3.3*, p. 159). Please note that frequencies are only indicated for the set of documents retrieved from the company server, one employee newsletter and the auditor's report, for a total of 119 documents. The reason for this is that only those documents were produced exclusively for the change project at R&P UK, or hold specific relevance.

The document production is compared to the task execution by project participants. In almost every single document tasks are assigned to individuals and required to be completed by a certain due date. These 131 task delivery dates reflect project activity over time. According to the integrated framework of learning and memory described in section 1.9, such task related activity by individuals or groups precedes formalization in a given context. Therefore, the task frequency was added as a comparative factor to assess the proposed learning model.

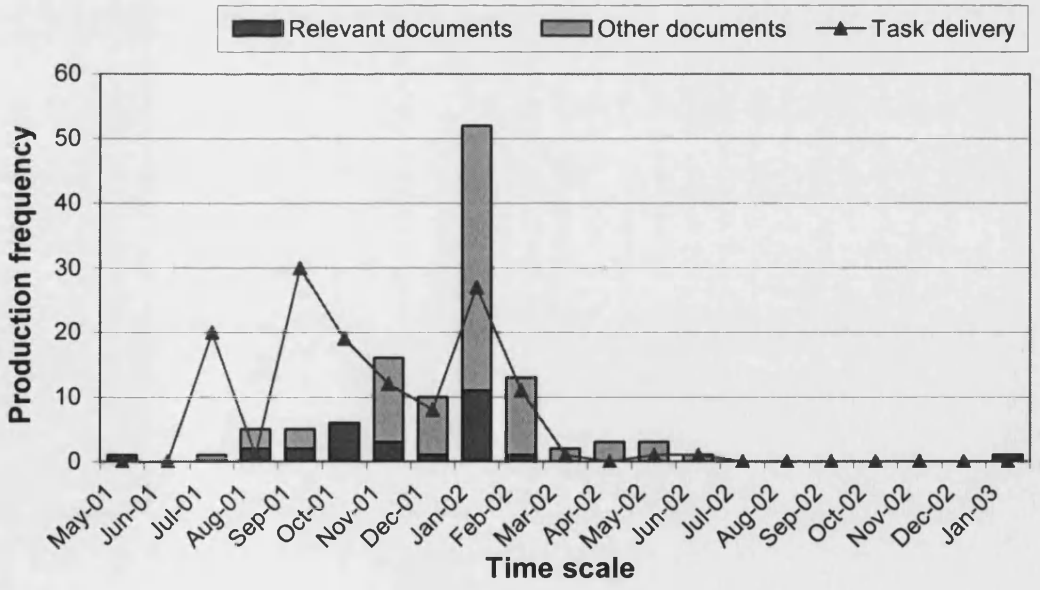


Figure 4.3: Frequency distribution of the document production and task delivery

The diagram shows a peak of documentation activity right before the closure of the warehouse at the end of January and the SAP start at the beginning of February. The document production starts in May 2001 with the first presentation of the project plan to the British managers by the executive team from headquarters. It then reaches a peak right before the 'going live' date, and significantly decreases afterwards. Interestingly, only technical specifications are formalized after February 2002. The only exception is an outlier in January 2003, the auditor's report that mentions the SAP implementation. The reason for this time gap is that the auditor company conducts its assessment at the very beginning of each year and then immediately produces a report. As the system implementation was still in progress in January 2002, it was not included in the particular report for that year.

The two key findings for the document production are the peak of formalization activity right before the closure of the warehouse and the official implementation date, and the lack of non-technical, internal formalization after the implementation date. It must be suspected, as indicated in the interviews, that there was no formal project evaluation. This assumption will be revisited in the content discussion.

In a second step, the formalization effort was compared to the tasks undertaken by the members of the project management teams. It can be seen that the overall task distribution lies to the left on the time scale compared to the document distribution. Therefore, in general the task executions seem to precede the production of documents, thereby corroborating the stage sequence of the learning model. However, this conclusion needs to be treated with caution. From a project management perspective it might be sensible to produce few documents with many task assignments at the beginning of a project, and many documents with more evaluative contents towards the end of a project. On the other hand, there was seemingly little evaluation found for the end phase of the present project. In any case, the stability of a sequence of task execution and subsequent documentation will be moderated by the nature of a given project. Nevertheless, in this particular case a trend in the data can be detected that would confirm the assumptions made in the learning model. Bauer (1993) used a frequency assessment to track emergences of resistance in a project over time. A similar analysis would have been interesting in the present context, but the coding procedure revealed an absence of formalized content about resistance. A closer look at the document contents will confirm the validity of this finding.

In contrast to the interviews, there is virtually no retrospective perspective in any of the documents. All content, even the few evaluative statements, are basically anticipatory in nature. An examination of the location of documents within the organization's hierarchy in terms of sender and receiver reveals stark lopsidedness. Wherever a sender can be clearly identified, it is an individual situated at German headquarters; the sole exceptions being the auditor's report and the employee newsletter. The documentation seems to exclusively originate in Germany, and is passed on to the British subsidiary, while German colleagues receive copies as well. For example, all meeting minutes are drawn by members of the German management team. Change recipients seem to be excluded from the formalization effort.

A great number of interview codes were not applicable to the document data. Most interestingly, there was no mentioning in the documents about 'redundancies', 'uncertainty', 'shock', 'anxiousness', 'feedback', 'resistance', or learning in any form. All these topics must be deemed important for the success of any change, but did not reach the formalization stage in the present project.

The thematic category 'operational project management', which stands for technical and logistical information about the change project at R&P UK, accounts for the overwhelming majority of document content. Since this type of information is peripheral to the research focus, the thematic category is repeated for several clusters of codes (see Appendix K). The category is labeled 'operational project management', as opposed to a non-technical, staff-centered perspective on project management that is of interest in the present study. The content of this thematic category will not be discussed specifically.

The 13 codes from the interview coding frame that were retained for the document analysis account for only 185 quotations out of a total of 1143 (see Appendix L), that is 43% of the codes combine only 16% of the quotations. In the context of the document analysis, code frequencies have more of a meaning than in the case of semi-structured interviews, because the frequencies are not confounded by the researcher's questioning. Of the 185 non-technical quotations 113 pertain to the codes 'formalization' and 'planning the implementation'. The latter code consists entirely of information about the organization of planning logistics. The code 'formalization' is a somewhat tricky relict from the interview coding, since in principle any document will be formalized informa-

tion. In the present case, the code was assigned exclusively to the documentation of project steps and decisions taken, in essence the creation of a paper trail. Any formalization of new knowledge by users working with the new system was not found, because the formalization effort practically ended shortly after the system implementation.

In sum, it should be stated in advance that there is a paucity of non-technical data in the project documentation. Even in the 28 content analyzed documents originally selected for their non-technicality, issues of a directly task related, performance oriented nature hold the vast majority. Given the complexity of the project, this might not be surprising. But an overwhelming dominance of content related to operational project management seemingly comes at the expense of attention to feedback, consideration of learning, and a general interest in how the change is accommodated by its recipients. In this way formalization is not a consolidation of prior learning, but a process of amalgamating instructions, decisions, and responsibilities. The formalization then assures accountability and uniform technical specifications, but ignores the human factor in the midst of the change.

After this initial outline of the characteristics of the interview and document data, the following sections contain the results corresponding to the variables of interest of the functional analysis of resistance, as shown in *Figure 2.2*. The findings on resistance, contextual factors, awareness, and learning will each be described separately.

4.2 RESISTANCE IN THE PROJECT

As outlined in the methodology chapter (section 3.4.1), the occurrence of resistance in the project is reconstructed from several data sources and reflects a synthetic judgment, as no independent data could be systematically collected for this variable. However, the combined observations contain sufficient evidence to outline a resistance stimulus in the project.

The change project at R&P UK experienced some minor resistance. The resistance in the project was essentially confined to a single individual, Robert Walsh, the IT manager at the British subsidiary. Mr. Walsh's resistance can be depicted as reluctant cooperation or distinct problem orientation. Described by one German manager in a

passing comment as a "catastrophe to work with", the British IT manager was characterized as seemingly concentrating more on pointing out the shortcomings and flaws of the new system during the preparation of the implementation than on the proactive finding of results. Robert Walsh himself was very cautious in his commentary on the project, since he was aware of especially the German side's dissatisfaction with his cooperation, but did express his disappointment with SAP as a software tool and then generally with the way the implementation was undertaken. The word 'frustration' was used 24 times in his descriptions.

> "I keep saying we, because I didn't get this feedback from other people, I'm perfectly happy to say that was my view at that particular time. [...] I'll be quite frank, I'm not a great fan of SAP from what I've seen of it. I'm really not a great fan." (Robert Walsh)

On several occasions during the study, Walsh made negative comments about the new system and its implications for the subsidiary, and he also expressed his discontent to his colleagues. When compared to the manifestations of resistance that are listed in *Table 2.1* (p. 92), elements of his resistance included reduced performance levels, criticism of management, and irony, as described by co-workers and the German management. There was a unanimous agreement among the German managers that Walsh was more of a hindrance than a supporting factor during the change.

Robert Walsh's behavior illustrates that the proposed working definition of resistance as non-acceptance of the change should be understood broadly, as the IT manager's reluctance and problem orientation only somewhat delayed the implementation process, but did not bring it to a halt. The reasons and circumstances for Walsh's behavior as well as the reactions to it will be explained in the sections on contextual factors and on the awareness of resistance itself (specifically the sections 'A difficult project', p. 189, and 'Resistance is futile', p. 208). These sections also illustrate reasons for the generally low level of resistance in the project. It will then be assessed how the found resistance was influenced by contextual factors and whether it constituted enough of a stimulus to raise awareness and trigger learning.

In the following three sections on contextual factors, awareness, and learning, the coded interview and documentation content as well as the repertory grid results will be presented. The interview and document content is split up according to basic codes and thematic categories that correspond to the focal variable for each section (basic codes

and thematic categories for interviews and documents can be found in Appendix F and J). For example, the following section on contextual factors contains the content related to the basic interview and document codes 'demographics and job description', 'organizational relations', the project', and 'the new system'. Within those basic codes, the generated thematic categories are used to structure the presentation. In addition, for each thematic category of the interview material, the content is compared between the subgroups of UK managers, German managers, and UK employees. This comparison was not possible for the document material, as documents were produced almost exclusively by German managers. For the variables awareness and learning, the presentation is divided into three levels of analysis, as shown in *Table 3.2* (p. 138). In general, the interview material is richer in content, while the documentation in some cases fails to provide information relevant to the interests of this study.

4.3 CONTEXTUAL FACTORS

As mentioned in the paragraph above, the result presentation on contextual factors is divided into four sections. The first section below contains the findings on the basic code 'demographics and job description' from the interviews and documents.

4.3.1 Demographics and job descriptions

The first cluster of codes contains mostly basic information about project participants' job descriptions, project roles, and some demographic data. This will be presented before relating attention to the content of the first thematic category 'UK is doing fine'.

The core groups permanently located at the UK subsidiary's headquarters and relevant to the SAP implementation are accounting, customer service, and IT (see Appendix B). Accounting consists of two employees (and an external controller) taking care of the all the regular accounting duties, such as payroll and purchase ledger supervision and reporting debtor days and customers' cash situations. The unit is headed by Paul Samuelson, the financial controller, who reports directly to John McGregor, the managing director. The customer service unit comprises six employees (plus two that

joined on a part-time basis after the change). Each employee, or customer service representative, is responsible for a certain sales segment or product returns, and acts as a contact for customer queries, which are mostly done by telephone. The customer service group is headed by Kevin Franks, the operations manager, who reports to John McGregor. This side of the business in combination with the operation of the warehouse used to be led by a superordinate general manager, Hugh Prescott, whose function was removed as a consequence of the change project (this will be elaborated later). At the time of the research study, information technology at R&P UK is represented only by Robert Walsh, who reports to John McGregor. The unit previously consisted of four employees and Mr. Walsh as manager, but was reduced to one employee as a result of the change. In the ensuing months this single employee, Alice Farnsworth, was transferred to the retail section, leaving Robert Walsh to represent the IT department on his own. IT in the UK today deals mainly with hardware maintenance, network connections, and problems with office applications. All SAP control and maintenance is done from German headquarters.

The British subsidiary has several divisional and functional contacts at headquarters in Germany. It is essentially allocated to the logistics section of the company's tableware division. Headed by Heinz Berwanger, who is organizationally located directly underneath the company board, the logistics section comprises all storage, distribution, and customer service functions worldwide. Subordinate to Heinz Berwanger, Manfred Becker leads the worldwide customer service function and employs Sabine Fischer as his regional customer service manager for the subsidiaries in the United Kingdom, France, Italy, Spain, Portugal, Greece, and South America. Regarding the IT component of the project, Peter Schmitdbauer is the manager in charge at headquarters. IT in Germany is organized in a matrix structure, where Mr. Schmitdbauer is the head of retail applications functionally and head of IT for the tableware division sectionally. The four German managers initiated the change project and supervised its execution.

Rousseau & Paul as a company experiences relatively low personnel turnover. This is indicated by the average length of tenure for the project participants being 14.6 years. Project participants' age range spans from 33 to 59, with a mean of 47 years. Managerial roles in England and Germany are exclusively male dominated, and hierarchical levels are emphasized in organigrams, job descriptions, and perpetuated in project roles.

UK is doing fine

The UK subsidiary accounts for about 5 percent of company-wide sales and was very profitable at the time of the research study. Britain is the third-biggest European market of the company, behind the core markets in Germany and France. Despite a general economic slowdown in Europe following the burst of the internet stock market bubble in late 2000 and the terrorist attacks of September 2001, the British subsidiary has maintained its profitability and slowly expands its market share. This growth stands in stark contrast to Rousseau & Paul's other national markets, namely France and Germany, where the recent record of economic indicators was not quite as favorable.

> "We made money. When R&P first bought us we lost money, and as the years went on under John McGregor's guidance, we made profits, we returned money to Germany, and that was quite important. And we did that because we liked what we did, we pushed forward, we challenged." (Hugh Prescott)

> "Profitability, uh, we make the highest profitability at the local level of any of the subsidiaries, in consolidated profitability I'm not quite sure where our ranking is, but we're one of the major markets in terms of consolidated contribution." (John McGregor)

> "We've grown the business virtually every year since R&P bought it out, we feel we're doing a good job." (Kevin Franks)

The profits contribution of the British subsidiary to R&P's balance sheet was emphasised on numerous occasions by UK managers. Profitability as the main measure of successful operations is not only a source of pride, but is displayed as an indicator of commitment to one's job and to the company as a whole. It is interesting to note that expressions of commitment were usually not confined to one's own performance, but related to all the staff in the subsidiary. Taking the job seriously and serving the company to one's best ability is a pervading theme in the juxtaposition of British operations and German headquarters. As the research study in the eyes of UK managers was initiated in Germany and in part re-evaluated past project performance at the subsidiary, highlighting the quality of the British effort might be understood as a protection reflex. The quoted facts and figures were used to indicate to the researcher that the project was indeed a success, and that this success is linked directly to managerial performance and commitment.

The absence of comments by UK employees and German managers in this thematic realm reflects on the power positions in the organizational hierarchy, and the role behavior of respondents. To the German management as the authorizing change agent,

this project is one in a series of similar implementations that is prescribed and executed according to a previously tested itinerary. Since prior implementations have been accomplished satisfactorily, it can be anticipated, even at this early stage of the result presentation, that success for the present project from the headquarters' perspective is defined almost entirely as acceptance or non-acceptance on behalf of the change recipients. UK employees, at the bottom end of the hierarchy, might not have understood their position in the project as critically appraised or challenged, because they perceive themselves as passive recipients who cannot be held accountable for a change they hold no responsibility for. Their job role might not encourage proactive appraisal of organization-wide issues, and confines them to compliantly accept predetermined measures. As a result, the reconstruction of the change project does not induce employees to highlight their commitment. In contrast, UK managers are change agents and recipients at the same time, and are held directly accountable for project outcomes. They are responsible for executing directives from headquarters and adapting them to local requirements, while catering for their employees' needs and abilities. Safeguarding their accomplishments and legitimacy in the light of retrospective enquiry and evaluation by highlighting commitment is understandable given the outlined rationale.

At this early stage in the presentation of data contents, the deduced explanations for the motives behind responses must appear speculative. Yet, meaning-laden responses are hard to discuss out of context, and as a result some produced conclusions might anticipate findings presented in later sections. Such concluding in advance is kept to a minimum and will naturally decrease as the entire results structure becomes more complete.

4.3.2 Organizational relations

Decreased independence

The British subsidiary traditionally held a very independent position within Rousseau & Paul before the change. Due to a mix of geographic distance, a different language, and different business customs R&P UK was always perceived as a more or less autonomously operating unit within the organization. The reasons for this lie mainly in the history of R&P UK as a formerly separate company (named Perevia, acquired by

R&P in 1987). Moreover, it is despite the facts that, as one German executive pointed out, Berlin is further away from headquarters than London, and many other European units speak languages other than German as well, but are much more integrated.

> "England has, I believe, a very special role in our company, one which I never really understand 100 percent, but that's how it is." (Peter Schmitdbauer)[26]

> "I think there is definitely a viewpoint in Germany that we like to do things our own way and that this can cause problems, but I thinks that's always been the case, [...]. I'd been used to working for an independent company, and I think there is a bit of a hangover, even though it's 16, 17 years ago, there is still a bit of a hangover with that." (Kevin Franks)

As the UK subsidiary operated in accordance with the same company-wide principles of management and operation, which were recognized on both sides of the British Channel, the named independence seems to have existed more in respondents' perceptions than as an actual fact. However, several respondents highlighted the differences between headquarters and subsidiary. Such differences were mostly confined to issues within R&P and only sporadically attributed to differing national cultures. Despite one respondent's belief that the way business is done in the UK has a stronger resemblance to customs in the United States, the vast majority of British respondents understood Europe as their point of orientation in terms of business culture. Yet, especially on the British side an impression that headquarters did not sufficiently appreciate local idiosyncrasies was voiced.

> "It is probably a preconception which is unjustified but nonetheless existed that our experience with the head office of the company tended to indicate that they took less notice than we believe they should have of the local conditions which existed in a foreign subsidiary, which is of course what we are." (Robert Walsh)

> "We feel we know the business better than they know it in Germany, the UK business I'm talking about. So that does cause conflict at times, but don't think it's got any worse, I think it's always been, and it probably will always be there." (Kevin Franks)

In contrast, the German side did not perceive cultural or operational differences a major factor. It was rather pointed out that the UK subsidiary's perceived independence created some friction, albeit nothing insurmountable. German managers stressed that they operate in an international environment on a daily basis, which instills awareness about regional individuality, but at the same time fosters a boundary spanning company

[26] All quotes by German respondents appearing in this and other sections have been translated by the researcher.

culture. As a lesson from similar earlier projects, the importance of personal exchanges and visits was highlighted, especially since a stronger hierarchical structure was felt at R&P UK by the German management.

> "[Differences exist] on questions of, how decisions are set up, how is the hierarchical integration, or how does the organization live the hierarchy. This can be very different. Uh, you have to think about these things in advance and say, how do these people function, and after that you can design certain processes, and that is, the English work very hierarchy-driven and very hierarchy-prone. [...] We work considerably more in a team here." (Heinz Berwanger)

This hierarchical rigidity at the subsidiary led to some irritation on the German side, because even miniscule issues often required the presence of the entire project management for any decision to be legitimized. To illustrate the hierarchy issue, one German manager provided an anecdote about his first visit to the UK site, where he was not invited to walk up to the first floor of the premises because this was allegedly reserved for executives only.

In sum, there was an underlying theme shared among all respondents that the British subsidiary was somewhat more unique and autonomous than other European units, and that cultural and operational differences have to be taken into account during the project planning and implementation.

Given the above discussion about the standing of the British subsidiary within the company, the system integration during the change project fundamentally reduced any amount of factual or perceived autonomy in the UK, because it tied the British operations closely to those of the German headquarters in two ways. The implementation of the enterprise resource planning software SAP R/3 integrated the subsidiary into the IT architecture of the rest of the European operations. SAP is administered and maintained at headquarters and connects the company's units in real time. Above and beyond a harmonization of software applications, this implies a significant control function, because the system allows for a greater transparency of task executions. Any operation on the system, such as order placement, product returns, and money transfers, can be directly monitored, recorded, and traced back to a specific employee within the entire company network. In addition, changes or amendments to the system require administrator privileges and are restricted to be done exclusively at headquarters. The second reduction of independence stems from the closure of the local warehouse facilities and the introduction of a centralized distribution of goods. Customer orders are now entered

into the system, which sends them to the main European warehouse in Germany, from which ordered goods are shipped directly to the ordering customer site. Instead of holding a large amount of products in stock, the UK subsidiary essentially turned into a sales office with an attached accounting unit as a result of the project. The two changes combined brought about not only an alteration of operational procedures, but also a trimming of local decision authority. This was felt sorely by UK management.

> "The shift of control has moved into Germany. The freedom of decision, the freedom of innovation has been taken from R&P UK. If you ask me what the biggest problem, the biggest downside of what they did to the UK business was, it was they removed from us our own individuality. They removed from us the innovation we liked, and we became more of a copying machine [...] Did Germany want someone to be so individually in control? They wanted individuality out." (Hugh Prescott)

British managers critically commented on the undermining of their authority due to the system integration. Figuratively speaking, the UK operations were put on a shorter leash, and the instantaneous transparency of internal everyday actions caused performance to be externally observable. The decline of autonomy was naturally felt strongest in the IT department, which will be discussed later. In summary, the UK management expressed concern about a development that reduced their self-determination and changed the nature of the UK operations from a fairly independent business to a monitored agency.

The perception of decreased independence is actually shared by German management. Respondents in this group are well aware of the transparency function of the new system and the connotations of the now centralized distribution.

> "[There was] reservation about the transparency of data as such, yes, which took certain liberties, mainly of course certain independences, where you can do something yourself, away from them." (Manfred Becker)

> "I mean, it is clear that up to the point of the warehouse closure, they were their own masters, they had their warehouse and could operate that, distribute quantities, however they liked. Now they are bound to a central system, and could no longer decide about stock in the warehouse, but had to subordinate themselves to a degree." (Sabine Fischer)

Acknowledging the consequences of the change to their British colleagues did not lead to a dispute of the introduced measures, however, but to the assumption that this is something the UK subsidiary would have to arrange itself with, as it is in the interest of the entire company.

Interestingly, UK employees to a large extent did not share their local management's concerns, but instead highlighted some advantages of the system integration for

their daily procedures. It was noted especially in the customer service that employees now felt more as being a part of a big operation than an isolated unit. If mistakes are made, the new system provides an additional layer of control to fall back upon. Moreover, SAP appears to make more information, such as stock holdings and production planning, available for the order process. The new system also takes the control of the order process away from the immediate environment to a more distant supervision. This latter point, however, was often connected to the same kind of concerns about the possibility of being closely monitored and the lack of control over the system's administration and maintenance that were expressed by UK managers. Overall, UK employees seemed to hold a somewhat more balanced view about the consequences of the system integration.

Centralized organization

The two parts of the change project, the new computer system and the introduced distribution logistics, resulted in a significant shift of control to headquarters in Germany. Not only is the implemented SAP software as the central nervous system of the company authorized and maintained by the central IT department, but the physical supply of goods to customers is now also executed by the central logistics department. This latter aspect detaches the UK subsidiary from any contact with the products of the company, except for a few product returns that pass through the local premises, and the adjacent factory outlet store. The customer service department is still the point of contact between R&P and its customers in the UK, but ordering, shipment and delivery, and production are either electronically integrated or are carried out by the main organization. Therefore, as a result of the change, R&P UK was rendered with significantly less decision authority over core processes, which were now centralized at headquarters.

The decrease in decision authority is reflected in the decision making process that led to the change project itself. Both decisions, to implement SAP and to switch distribution to the centralized warehouse, were made at headquarters, before consultation with the British management team. Since the change in Britain was the fourth project in a series of similar efforts with other national subsidiaries, German management did not see an urgent reason to integrate their local counterparts in the decision making process.

> Interviewer: "But the decision for the project was basically made here?"
> Heinz Berwanger: "Yes."

> Interviewer: „It wasn't asked somehow in a meeting 'Do you want this?' or 'Should we discuss this again?'? That was done here [at headquarters] already?"
> Heinz Berwanger: "That was done here already."

> "It was a done deal, well, I mean as far as, well, the SAP part was a done deal, the distribution change was a discussion initially rather than, you know, this is going to happen and you've got to sign onto it. There was quite a lot of discussion about, would it be feasible, would it make sense from our point of view, and we worked through that and we did come to the conclusion that it was the right thing to do. SAP was a done deal, and there is no question about that." (John McGregor)

> "We consciously chose a harmonization approach there, of course, and harmonization with England, we know this from many areas, is not so easy. Indeed. [...] Had we done this any other way, had we said we'd put this as a separate company into the retail system and they'd have their own warehouse, then I'm sure that all our English proficiency, our diplomacy, and whatever else would certainly not have been enough to truly find the best way of harmonization. I'm sure about that." (Peter Schmitdbauer)

There is obviously a synergy effect in the combination of the two parts of the change, which will be discussed later. It is interesting to note above that the British respondent recalls a negotiation process for the warehouse issue, while both German respondents do not. In retrospect it is difficult to reconstruct the sincerity of the German side in the negotiation process about the warehouse closure. Overtly putting the warehouse closure under consideration, without any real intent to change a foregone conclusion, might also have been a tactic to ease anticipated resistance in the negotiation process. Another interesting observation in this topic area is the fact that UK employees were not involved in any consultation process either. While UK managers resented the disregard from headquarters for their opinion or expertise in deciding about the change, they themselves seem to have neglected their employees' proficiencies and insights in just the same manner.

> "This was a fait accompli.[...] The one thing they missed out was discussing what their future plans were in an earlier stage with John McGregor, [...] And that they didn't do, they took an autocratic decision, in Germany, what we're going to do, and consulted no one outside. They thought they knew better." (Hugh Prescott)

> "We were just told that, there was no discussion at all, and not at my level anyway, they [UK management] just said this is what R&P decided to do." (Alice Farnsworth)

It could be argued that since UK management itself was essentially ordered to comply with prescribed measures, there was no scope for employees' opinions, and the fait accompli was simply passed on to the British employees. But even if there was no

possibility of changing a directive from headquarters, the style of presenting the decision to UK employees was just as autocratic. Moreover, daily activities at the subsidiary are still overseen by the local management, and rely on the proactive involvement of local employees. In sum, centralized, non-participative decision-making seems to be a characteristic of R&P's organizational culture that spans across national units.

The normative power of the factual

This thematic category was extracted from the project documentation and corresponds to the three codes retained from the organizational relations cluster in the interview analysis. Apart from conceptual aspects of the system integration and the provision of support from headquarters, the recommendation is elaborated to implement SAP and centralize distribution. Relating to the decision making process, the recommendation stems from the first presentation of the change plans to the British managers by a team from headquarters.

This presentation holds a central role not only within the document data, but also for the shaping of project dynamics and perceptions of the change recipients. Some German managers in the interviews emphasized that the decision to go ahead with the change was put up for discussion in the first meeting. In contrast to their assurances and the careful use of the term 'recommendation', the document reveals more than just an optimistic intention to alter the British subsidiary. The normative power of the factual is engineered by the inclusion of an organigram of the project management and a detailed time plan for the execution of the project. Once such facts had been created the direction of the discussion must have been predetermined, leading change recipients to perceive the decision as a fait accompli. In conclusion, this document corroborates the cautious statement by the most senior manager from headquarters in the project that the decision was made before the first meeting, and it invalidates other German managers' assertion that this was not so.

4.3.3 The project

A change prescribed from headquarters

The announcement of the upcoming change project caused concerns to emerge among the British participants, whether the prescribed measures would work out under the particular circumstances of the British subsidiary. Such concerns were related to the

two aspects of the change, specifically whether the SAP system would be configured to serve local needs and whether a distribution process from a central warehouse far away from the British market would be sustainable and could be performed reliably. Especially the shipment process was liable to a definite objective, as British customers are guaranteed to receive a delivery within 11 working days from the time of the order input. Used to a large local warehouse operation and being the point of contact for customer complaints, UK employees were very skeptical about the feasibility of the new delivery procedures.

> "And there was a point of concern, when, I guess just about two years ago, I had felt we hadn't yet received enough information about SAP and how it would actually implement, and I was being provoked by our auditors who were saying, we hear that you're going on SAP, have you had manuals, have you had information, have you had an input into this, because it's a very unforgiving system, it's a very good system, but once it's set up it's very unforgiving." (John McGregor)

> "I was obviously concerned as to how it would work because we couldn't get china from here to our customer in one piece, so the thing was how it was going to get from Germany to our customers in one piece." (Rose Browning)

Concerns on the German side did not involve information policy or communication efforts, but centered on the smooth management of the project planning itself and on procedural aspects of the change. After all, the simple fact that, with the centralized distribution, goods need to be transported across or under a stretch of ocean to reach the British market posed some logistical problems. Issues such as recipients' acceptance or other somewhat more behavioral factors were not part of the agenda at headquarters.

The British unease with the announced change measures was also fueled by recollections of similar earlier changes at continental European subsidiaries, namely Austria, Switzerland, and France. This unease was substantiated by the fact that headquarters explicitly structured the UK project based on those earlier implementation experiences. Especially the efforts at the French subsidiary were used as a guiding principle for how to proceed in the UK.

> "We had said these are the experiences with Austria, Switzerland, and France, it will be somewhat similar, and our time horizon is largely determined. If we then say the situation in England is somewhat comparable, let's say specifically with France, yes, because you have to fiddle with other delivery contractors, that is somehow a totally different mentality, and so on. Austria and Switzerland were mentality-wise much closer. We realized that during the France project. Now, if you're dealing with the English, you'll have certain difficulties to use France as a role model, but we managed to do this." (Manfred Becker)

The French project, however, was reconstructed by British management as a particularly negative example of autocratic decision making, unexpected consequences, and lack of local participation. Whether this impression is fact-based was not verifiable and goes beyond the scope of the present case study, but it sufficed to further raise concerns about the feasibility of the change and the adequacy of its planning strategy.

> "I believe, it wasn't quite as smooth in France, is what I heard, the transition, and both things happened there, closure of the warehouse, movement onto SAP, and I was told it wasn't so smooth." (John McGregor)

> "And the closure of France was not the most harmonious closure, it was not greeted well by the French people because it wasn't embraced well by the French management, and the method of distribution and the control of the finances were taken away from the French office and it was having some really bad effects on the customer relations, on the credit control side." (Hugh Prescott)

Hence, the prior implementations did not instill the British side with confidence that the proposed measures were pre-tested and well functioning. Instead, they rather strengthened the perception that what was to come would be a generic change concept uniformly rolled out across national units.

Once the decision to go ahead with the change was introduced, the German management provided an itinerary for the project, which was based on the plans of the earlier projects in other subsidiaries. Monthly meetings between both management teams were arranged and conducted mostly on the British premises. These meetings followed a precise project management agenda and participants matter-of-factly processed a set catalogue of issues. Given topics were discussed and finalized by assigning tasks to participants and setting dates for the delivery of those tasks. The economical recycling of tested project plans, however, led to complaints on the British side. The argument was that a generic solution would be imposed on a unique environment. This relates back to the discussion on the British subsidiary's apparent independence, or the decrease thereof as a result of the initiated changes. In addition, the used planning approach, regardless of how many times it had been previously applied, was actually interpreted by some as a lack of planning for the local circumstances.

> "The problem that we really encountered was, the lack of planning and thought that Germany exercised during the whole operation, [...]. Something as complex as closing a warehouse and installing a totally global computer system would have needed to have unfortunately a lot of time and energy spent in meeting stages to discuss information and detail down to, and stop at, the individual tick boxes. It didn't seem that it was enough to get to that

> point, it kind of got to here, and the rest of it became detail, and it wasn't detail, some of it was very relevant. And they weren't prepared for it." (Hugh Prescott)

In their reconstruction of the project, the German management revealed that in the original European strategic plan on centralization and integration that was devised by a management consultancy the UK market and subsidiary was not included. Reasons for this were the geographic distance, the added complexity of having to cross the British Channel, and the comparative autonomy of the local organization. But after three successful integration and centralization projects on the European mainland, German management felt adequately confident to tackle the British market. The time frame after the initial decision to go ahead was set for a 9-month duration, from June 2001 to the beginning of February 2002. In retrospect, one German manager concludes that such a long time frame was not entirely necessary, since a substantial amount of synergy could be created by relying on prior experiences. Answers regarding the required time frame were, however, somewhat contradictory amongst German managers, because some also argued that, given the friction and discontent experienced by their British colleagues, more time, especially personal meetings, would have been better. Others remarked that the entire process was very much concentrated on eight weeks in the summer of 2001 and six weeks prior to actual system change.

> "This shows me essentially that we, uh, for these talks should have invested substantially more in the preparation, and that we'd rather do a meeting too many than too few, especially on site. That's certainly, well, I believe we were there six times, six days in total by the actual key project team, not more, that's certainly not much. [...] So, being more at the actual site would have probably fostered the harmonization process in people's heads stronger. Indeed." (Peter Schmitdbauer)

A difficult project

In their reconstruction of the project, respondents treat the two parts of the change largely as separate events. The chronological co-occurrence was endorsed, however, by a stringent rationale of the two parts of the change being notably interdependent. To be more precise, SAP could have been implemented without a closure of the local warehouse, but the closure and subsequent centralized distribution could not have happened without SAP. Only an integrated, real-time IT architecture enabled the complex logistics behind a centralized distribution system.

> "If SAP hadn't come in and hadn't enabled the sort of mega-warehouse operation, which exists in Mitterwald at the moment, then almost certainly we would have continued to have a warehouse here." (Robert Walsh)

> "We didn't of course just hop onto an SAP conversion in a slapdash manner, but there was this Logistics-IT roadmap for the general worldwide harmonization of all IT solutions. [...] This went hand-in-hand between logistics and IT measures" (Peter Schmitdbauer)

The British warehouse could have been kept open, but since the SAP implementation required a complete new setup of an extensive software package, this setup would essentially have to be repeated should the organization later decide to switch to a centralized distribution. Hence, the combination of the two parts of the change created potential for synergy effects. This rationalization was also very persuasive for people at the UK subsidiary, who could in principle have objected to a double change effort at the same time. Nevertheless, despite the anticipated synergies, the rationale still dictated two changes at once.

The decisions to implement a new computer system and at the same time close the local warehouse and switch to a centralized distribution required extensive adaptive capabilities from participants. Not only was the change substantial to business processes and operations, but also it essentially altered the identity and purpose of the subsidiary, which is now entirely a sales unit.

> "So therefore there was a big change in the operation of the whole unit here because suddenly from having a warehouse with how many people in a work unit and deliveries coming in from Germany and going out to shops and our different customers, we moved to the very much clearing up, clearing, storing type of operation which is going on there now. That was a pretty dramatic change to be going on in the background while all this [the software implementation] was happening." (Robert Walsh)

> "We dismantled the warehouse, we introduced a completely new software for all areas, except the retail, and went live on one day with a big bang, except for accounting. So this indeed was a larger project." (Heinz Berwanger)

Preceding the 'big bang' day of conversion, an interim phase was launched during which the stock intake for the local warehouse was gradually faded out. More and more orders were sent directly to the central warehouse, which at the time was a cumbersome process, since the SAP order system had not yet been installed, therefore requiring detailed handwritten orders to be sent via land mail to Germany. At the same time, a comprehensive data migration operation was undertaken to move electronic information onto the SAP system. An initial focus on customer information, such as delivery addresses, balance fees, and orders, revealed inconsistencies in the customer data file, which in turn necessitated a considerable overhaul of the specific data material. A simi-

lar update became necessary for product information. The interim phase carried on, albeit unofficially, until two to three months after the conversion day, because the data migration was partially incomplete and employees had to utilize the old computer system for reference. Juggling the system implementation and at the same time continuing daily operations at no reduced pace proved difficult for employees and demanded substantial extra effort.

> "We weren't given an advance, we weren't given like 2 to 3 months training in advance, we were literally flowing right into the new system, live." (Dheepa Naidoo)

> "It was a strain I would say for everybody for the first month, because, it would have been different if they had shut the office for 2 hours a day, 3 hours a day so, but it wasn't, the office was open from 9 to 5:30 as usual." (Jane Adams)

To assists the switch and respond to any upcoming problems, a member of the German IT department was on site for four days immediately after the conversion on 1 February. In contrast to their British counterparts, the German management emphasized the importance of thorough preparation as the key to a successful transition. The details of the transitional process were perceived as being the responsibility of the local crew. Any critical issues were discussed in the planning meetings and support was provided for the conversion period, as mentioned above, but other than that there was no interference, or further assistance, from headquarters.

An integral part of managing the transition was the handling of necessary redundancies. As soon as the decision for the change was announced, it became clear that at least most employees in the UK warehouse would have to be laid off. This posed an immediate problem to continuous operations at the subsidiary, since R&P UK would be dependent on warehouse workers throughout the pre-change period up until the actual official date of conversion. Hence, an early disclosure of bad news would be expected to tremendously damage morale and loyalty. On the other hand, labor law and fair treatment dictated the informing of employees as soon as possible. The pivotal figure regarding this aspect of the change was Hugh Prescott, who was in charge of the warehouse operations as general manager, but who, at the same time, would also lose his job as a consequence of the closure. Before the change, Prescott was directly superior to Kevin Franks, the former being responsible for all operations of the subsidiary, including the warehouse, the latter being more immediately in charge of customer service and sales

forecasting. With the warehouse gone and R&P UK transformed into mainly a sales operation, it became apparent that the higher paid storage and operations supervision position would become largely obsolete, while the forecasting and customer service position became more central to the business. Kevin Franks, in consequence, received a promotion through the change, and an expanded job description. Hugh Prescott was forced to retire.

> "Most people before the news was announced would have said that R&P never worked without Hugh. Every nut and bolt in the place had my name on it. I was part of, I was almost, in my opinion, I was almost the heart of the machine, everything passed through me, whether it was my responsibility or not. [...]. [After the announcement of my dismissal], emotionally afterwards when I went home, no, it was quite dramatic." (Hugh Prescott)

From a planning and management perspective, it was crucial to have Hugh Prescott oversee the closure of the warehouse with a sufficient degree of loyalty to the company, given the effects the change would have on his own position. The warehouse operations were to be faded out in a controlled and gradual process, requiring the particular workforce to be adequately committed to fulfilling their assigned tasks.

> "He [Hugh Prescott] was instrumental actually in the success with which we made this transition without damaging the morale too much of the employees in the company, because there was a big danger that we would damage morale." (John McGregor)

> "Can I say that we're talking about May, beginning of June [when the change was announced]. I didn't go until the end of April, that's nine months of a death sentence. At the end of nine months the strongest people break. I don't think I broke but I did my job, and for the latter part I am honest enough to say that for the latter part all I did in the end was my job. I no longer opened myself up to say 'What is the greater picture?'. No, I said this is my job and if I saw something happening I thought 'Not my problem', and I had to take that attitude because I couldn't take the problems to my grave, I had enough." (Hugh Prescott)

As indicated, a successful transition towards a centralized distribution system not only depended on the dedication of the general manager, but also on the cooperation of the warehouse staff. After a few days' deliberation on the extent of the change plan laid out by the German management team in the initial meeting in May 2001, UK managers called in their warehouse employees one by one to describe to them future developments and the termination of their contract due to the upcoming closure. Severance packages were arranged that would include a bonus payment if an employee stayed with the company the entire time of the transition. This form of bribery, as one manager called it, was crucial to ensure smooth operations throughout the important and de-

manding Christmas period towards the end of the year, and for packing up the remaining stock to go back to Germany by the end of January 2002. UK managers unanimously highlighted their successful transformation management through being open to employees' questions, telling people early on about upcoming developments, and providing incentives for loyalty and commitment. Having managed to retain the majority of the warehouse employees until the final closure appears to be a proof of success of their efforts.

> "But we could demonstrate to the whole company that there wasn't a single person in the warehouse who felt that they were being treated badly in their severance, so we had to have an agreement with them privately, which was extremely confidential, whereas we had to let it be known that the principles involved were ones that were extremely favorable to those people, so we were actually looking after our staff and fighting for their rights as well as accepting what the company needs to achieve. And that was an extremely delicate balancing act; we were very good at that." (Hugh Prescott)

In addition to the warehouse layoffs, UK managers also anticipated a detrimental effect for the customer service and accounting functions in terms of staffing numbers. The change would not only shrink the size of the UK offices in total, but also integrate local operations with those at headquarters. This might function as an initiator for further centralization and, in turn, enable further reduction of local functions and staff.

> "We realized at that time that most of the people who were currently working at the warehouse would be losing their jobs. Uh, there was also a bit of a knock-on effect that there would be people within the offices who would probably lose their jobs because as certain parts of the work were taken over in Germany, you would not need as many people in the offices as here." (Kevin Franks)

The effects on the customer service and accounting departments were, however, not clear at the onset of the change. Any potential for certain service or accounting functions to be performed in Germany would be dependent largely on knowledge and regulations involved and not so much on the capabilities of the integrated computer system. Nevertheless, the dismissal of the warehouse personnel did affect the remaining employees' morale and emotional solidarity, issues that will be discussed in more detail in later sections and relate to such codes as 'anxiety', 'uncertainty', and 'resistance'.

> "Obviously, when the warehouse closed down, all the guys in there we'd been working with for many years, they had to go, they were made redundant. Some of them were quite old, particularly if you're in your late fifties, early sixties; it's not that easy to get another job. I think they were well looked after, I'm not saying that, but it was pretty sad, and some of them were devastated actually. [...] You know, it's not a very big operation here, so you did know everybody, and you did know their wives and their children or the

> names of the children at least, you know, all the things, and you did become emotionally involved." (Christine Peters)

> "The only thing it seems obviously, I don't think it did much for the morale downstairs, because they had a lot of friends outside [in the warehouse] who'd worked here for years and years and years, it was a big chunk of staff to lose." (Alice Farnsworth)

A much clearer and more immediate effect did the change have on the IT department of the subsidiary, which will be discussed below. In sum, the redundancies as the most tangible and for many quite painful aspect of the change had a prominent effect on the UK subsidiary. They were a highly salient indicator not only for a substantial decrease in size of the subsidiary's main offices, but also of the alteration of its operational purpose towards becoming a sales office. Moreover, the redundancies distinctly affected the confidence of the remaining workforce, which will be shown to be pessimistic as a result.

Although not removed completely, the information technology department at the UK subsidiary was most severely affected by the ramifications of the change project, namely the system integration with German headquarters. At one point employing 14 people, the unit still consisted of three employees and a manager at the time of the announcement of the change. Today the manager, Robert Walsh, is the sole remaining IT representative. Mainly with the assistance of Alice Farnsworth, Walsh used to be responsible for the maintenance of the former MACH computer system, of the online connection with headquarters, and of any software or hardware issues related to local operations. With most of modern office work being computer-based, the IT department had therefore been central to the performance of the UK subsidiary. As a result of the SAP implementation, however, the old MACH system was abandoned, local servers were removed to Germany, and essentially all maintenance and software related functions migrated to headquarters. Alice Farnsworth, although at times helping out on IT tasks, was transferred to a new position in the retail unit. Robert Walsh's job role substantially decreased, and his altered job description now centers on hardware issues and communication with the central IT administration in Germany.

> "My department has probably gone through most, I was going to say the most radical change, [...] a lot of that administration, much to our surprise, moved over to Germany. Uh, we still find that strange and a little frustrating." (Robert Walsh)

> "My job's gone totally basically. [...] At least we terminated the work down there. There is none." (Alice Farnsworth)

Robert Walsh himself expresses general frustration, but is careful to not be too specific. His colleagues more directly criticize the lack of local authority over an IT architecture that now constitutes the central nervous system of all their operations, and the diminishment of Walsh's role.

> "And that's the one criticism I would have of SAP, well not SAP but the way that we've structured it. I have an IT manager here, Robert Walsh, who used to have a department, which we've now basically got rid of because there isn't the same need, nevertheless Robert is a competent person, and from time to time we need to make changes to things, [...] and we don't have access, we don't have local access, which I think is wrong basically, so we have to apply to Germany. And then somebody there puts our request on the end of their list and several days or weeks later this small change is done. And I have never understood why we can't have one qualified person with local access." (John McGregor)

> "He was merely going to be a pawn to put it in, and resolve any issues that came out at the hardware front. As far as being an IT manager is concerned, you have the great frustration of saying 'I'm no longer a manager, because there is nothing for me to manage, all I do is fix keyboards, make a machine work. And every time I get a query in SAP I'm the one that sends the email to Germany and makes sure they send the answers back'. So yes, he probably had extreme frustrations." (Hugh Prescott)

While German management acknowledges the fact that the British IT department has shrunk substantially as an effect of the SAP implementation, they critically assess Robert Walsh's role during the transition and emphasize his alleged lack of cooperation.

> "The problem especially in the realm of IT with Robert Walsh was, he totally blocked himself to this project, he didn't accept any arguments that were in favor of it. And so was his behavior, and that certainly came up again and again in the project teams." (Heinz Berwanger)

> "Of course, he has certainly lost status, and if you ask me, he still hasn't really come to terms with his role." (Peter Schmitdbauer)

Adding to the detrimental effect of the change on IT in the UK is an expectation that the capabilities of the system might easily allow a further concentration of functions at headquarters. These developments bear great uncertainty on Robert Walsh's position since they might create further disparity between the original purpose and salary level of his job and the now scaled down job description.

> "Certainly from Robert's point of view, if I were him, I would be, I would've been worried about my job, because IT is something that they could possibly take over completely from Germany. I know he recognized that fact." (Kevin Franks)

> "For Robert Walsh [it was] very, very difficult to lose the good solution that the English had made for themselves, and get a relatively general solution that wasn't aligned so much with the specific requirements of the English IT landscape, of the English customers, of the English organization. Insofar he certainly had some emotional reservations, and certainly some worries that in perspective an independent IT landscape with himself as manager is at least not vitally required." (Manfred Becker)

As can be seen, there seems to be a great amount of uncertainty about the future role of the IT department at the UK subsidiary and the sole 'survivor' who remains to embody it at the time of this enquiry. Identified in section 4.2 as the sole change recipient exhibiting moderate resistance, his actions become more understandable as they are embedded in the context of the outlined developments. Together with the warehouse closure, the reduction of local IT functions most negatively characterized the change to British participants, and signalized a possible future scenario of greater integration, diminished local operations and further dependence for the subsidiary. How the project is evaluated in hindsight and what expectations respondents have about the future of R&P UK will be shown in the next two sections.

Success imperative

The change project at R&P UK was the fourth in a series of similar efforts to synchronize the distribution logistics and IT architecture of the entire company. Two further projects are scheduled for the subsidiaries in the United States and Australia. The focal project was set up as an adaptation and alignment of local operations with the central units of the company, not as an opportunity for ingenuity or the creation of a best-case scenario. Hence, there was little room for experimenting or failure. As the objective was a quick and frictionless change, there was no margin for error and little leeway to explore and evaluate. Profound learning and knowledge generation was clearly not a priority. As a consequence, participants highlight a relatively smooth transition and the seamless continuation of business operations as key indicators of a successful project. Anything but reaching the transformation target would have constituted a failure.

German management recognized the success of the project and cited controlling figures to prove it. The different language and mentality are listed as the main procedural obstacles. Better relations with the subsidiary through increased personal contact, and, of course, a greater proficiency in English are described as side effects.

> "I think one indicator that expresses quite directly how it went, we made twice as much revenue in February 2002 in the UK market than in February 2001, [...]. I think this is for me the biggest project success, that we went full speed ahead from day one." (Heinz Berwanger)

> "It was essentially transfer of communication, indeed, uh, we did this from here, yes, how do you say, almost in fabric softener mode. For us the challenge with England was to reasonably understand the language, the mentality, the communication, that was the biggest problem. If we had done this in Germany, we would have pushed through the project in two months." (Peter Schmitdbauer)

Hence, for the German side this was a confidence-instilling endeavor. No major obstacles to cooperation are perceived in retrospect, except for teething problems inherent to any change. The degree of self-assurance might be illustrated by the fact that a final project evaluation was neglected on the basis of the justification that everything turned out according to plan. It must then be concluded that there was a limited interest in feedback from the change recipients, a point that will be discussed in more detail in a later section. The project and the change had to turn out successful according to a preset agenda.

The judgment that the project was successful is essentially shared by all participants in Britain. UK managers emphasize their own cooperation with headquarters and the collective effort of the subsidiary, which they believe satisfied their superiors. Employees spend more time elaborating on the hard work involved, but equally label the project a success.

> "The integration has gone I guess quite well. [...]. Yes, there have been issues and there have been problems and there still are, [...], but nothing that we haven't been able to cope with, and I think that's the key thing. The business ran all the way through, is still running, the customers did not notice a different significantly when we changed from one system to the other, so by those kinds of definitions I think it was a success. [...] I mean everyone really was trying to make this, everybody bought into it ultimately. You know, this is going to happen, let's make a really good job of it, we've got to get through a period of change, let's make it happen." (John McGregor)

> "Well, yes, I mean, I wouldn't say it was a smooth transition, you know, because we were left high and dry really and a lot more people were quite apprehensive, because it was also a working office at the same time as a new computer system, so you still had your phone calls and your work to do, as well as trying to learn a new computer system." (Jane Adams)

In hindsight, the change is also construed as an economic necessity, because it would save costs in the long run. A fulfillment of the change agenda would therefore ensure competitiveness within the particular industry segment. It should also be mentioned that in the evaluation of the focal time period, UK managers concede that the change did not come entirely unexpected, insofar as there was awareness about earlier projects in other subsidiaries. Given the massive warehouse facility in Germany and the advent of SAP at the continental organizational units, it was reasonable to expect the

UK to be on the change agenda as well. Albeit, British managers were not expecting it to arrive so soon, but rather three to five years later due to the subsidiary's autonomy and its geographic position.

There are also some critical remarks among evaluations, mainly about those consequences of the change that relate to the earlier description of decreased independence. Here, the patent effect on local culture in combination with the autocratic decision-making at headquarters has left an aftertaste with change recipients.

> "I think it's definitely changed the whole culture of the place, it's definitely, I mean, it was very much warehouse orientated, the warehouse was probably very much the heart of the place, so I think with them going it was a tremendous wrench." (Rebecca Winterstein)

> "The new culture is much more of a commercial organization. The size of R&P, it's becoming more centralized, and therefore the freedom is gone." (Hugh Prescott)

> "I think they developed distrust for future decisions, and people like Paul and Robert and John must be sitting around thinking 'why didn't they tell me', what's coming next. And if they have that attitude, they've got to be remarkably good people to not let it affect their day-by-day judgment, and there aren't many people who can do that. I can't. [...] Globally, R&P should trust its upper management to be good at its job" (Hugh Prescott)

Especially the latter two quotes illustrate some side effects of a project with a purely technical focus. The influence of participants' experiences during the change on their expectations about the future of the company and their own work is elaborated in the next section.

Further layoffs?

On the basis of their recollections of the project and their resulting current situation, participants were asked to speculate about future developments. Managers in the UK reacted with a degree of caution to this question, generally providing unspecific answers or denoting insufficient knowledge to make any prediction. Only Hugh Prescott, presumably without the constraints of an existing employment contract on his commentary, explicitly anticipates further integration and centralization, which in turn would in his view stifle personal initiative and critical thinking. As a main consequence of such a trajectory of minimizing the UK subsidiary, he foresees further layoffs, with especially Robert Walsh's and Paul Samuelson's jobs becoming obsolete.

While not actively denying the scenario outlined above, German managers do not provide a clear indication, of specific future plans concerning the British subsidiary.

There certainly does not seem to be a roadmap of immediate further alterations, and attention at headquarters is shifted towards conveying the established transformation measures to other countries, namely the United States, Australia, and possibly Japan. A consensus seems to have been reached to leave the customer service operations in the UK, mainly due to culturally formed customer relationship management. However, the medium to long-term strategy clearly pursues a target of further integration and centralization across all units and subsidiaries of the company.

UK employees in contrast are more concrete in sharing the anticipation that the subsidiary will shrink further, and that they will be made redundant as a result. The dynamics of past developments are understood as an indicator of effects on their own positions. Especially the capabilities of the new computer system instill profound job insecurity.

> "I think we're going to be even more computerized, with less staff, I think such changes are to come. We're all going to be more computerized." (Susan Parker)

> "I foresee that we won't be here in 18 months time, 2 years time. I don't think we will be here. They won't need us. They can do it from Germany, have a call center in Germany. [...], they have the internet where I think they will offer wholesale customers the option to order online and get a bigger discount. So we're not needed. You need a moan center, you know, if someone wants to moan, have a complaint, you just need them, and that can be anywhere in the world. So I don't think we'll be here." (Jane Adams)

This anxiety and uncertainty about the future as a result of the change was probed into deeper and will be emphasized in the later section on the awareness of resistance.

The following last thematic category on the nature of the change project stems from the analysis of project documentation. Again, the document content is not particularly rich in non-technical information, which explains the brevity of this category.

Procedure according to plan

Four interview codes in relation to aspects of the project itself were retained for the document data. One additional code is exclusive to the document content (see Appendix J and K). The majority of quotations in the project cluster describe operational aspects of the change, while only a few contain non-technical information about 'efficiency' and the 'evaluation of the change'. As in the interview data, the efficiency gain of integrating a company-wide IT architecture with a centralized distribution was highlighted. All nine quotations on this code stem from the first presentation in May 2001.

Hence, it appears that German management tried to win the support of the subsidiary by emphasizing the economic justification for the change project.

There were also a few evaluative statements in the documentation, exclusively about the successful completion of planning and preparation stages. This project management according to the set plan is reflected in the monitoring of progress and formalized to make decisions traceable. It is interesting to note that at the last pre-implementation meeting on 29 January 2002 an evaluation meeting was planned for 27 March 2002. The meeting apparently did not take place, which again indicates that retrospective evaluation was not a priority during or after the project.

The IT department at the subsidiary is only mentioned insofar as its status quo before the change is described. Any foreseeable effects of the SAP implementation on the personnel or focus of activity of IT in the UK are not stated.

The second thematic category on the nature of the project in the documentation is 'operational project management'. This category, a central theme for much of the remainder of the document content, was covered in section 4.1.2 as non-essential for the current research focus and will hence not receive specific mentioning here.

In order to further contextualize the findings relating to learning and resistance, results about the new SAP system that the British subsidiary had to adapt to are presented in the next section. Following the gradual closure of the warehouse, the system implementation required an unprecedented learning effort and a potential for resistance by employees who remained at the subsidiary. However, an understanding of key aspects of the system is necessary to fully comprehend its effects on respondents. An account of respondents' verbal and formalized remarks in this area will be provided in the next four thematic categories.

4.3.4 The new system

Progress

The upgrade to SAP R/3 established a more extensive, quicker, and more reliable computer system. The new software brought an improvement to operational efficiency and integrated various organizational units. A direct link with headquarters enabled

faster throughput, that is, the journey of a product from the factory to the customer. But such capabilities also required the system to be increasingly complex to cover a myriad of processes within a large organization. While the introduction of SAP certainly had a normative function of redefining procedures, the interconnection of different elements of R&P's value chain remained an unsolved problem for some aspects. Hence, the widely acknowledged efficiency gain was accomplished through a trade-off for increased complexity.

> "It's a monumentally complex system, it is not a particularly good interface, not user friendly in many ways, [...]. We'd been told it's a wonderful system, and I've no doubt it is, it does many, many, many things better than any system that we've got before, [...]. But I was expecting something that is frankly easier to operate than it actually is." (Robert Walsh)

> "I have to say the biggest problem with SAP, and it's still the biggest problem that we have now is the fact that when we were first told about SAP we were told that one of the things it could do was it could tell you when product was available if it was out of stock at the time you wanted it. [...], that's a key thing, that's one thing the customer wants to know. [...] We were told that worked, and it was no problem, and it didn't work, and it still doesn't work today." (Kevin Franks)

UK employees, who have more of a user perspective because of their job tasks, more strongly emphasize the improvement that SAP afforded their work. Even though there might be room for improvement, the overall reaction to the new system was very positive.

> "It's much, to me it's a much better system than what we had before." (Jane Adams)

> "It's a lot easier. It's a lot, lot easier. [...] But, well, I feel myself there is a lot more what I would like SAP to do, for me." (Dheepa Naidoo)

Using the new system appears to have been fairly challenging at first. Employees provide many tales of their initial problems with the functions of SAP, each relating to specific job tasks or procedures. However, there is also agreement on a learning curve effect relative to the time spent working with the new system. Thus in general the initial struggle was mitigated as the familiarity with the system increased.

> "I think they [the other employees] saw it, it was something good that was happening, but in the back of their mind they thought 'Will I be able to do it?'." (Dheepa Naidoo)

UK managers share this recollection of the first encounters with SAP and ascribe most of the learning effect to on-the-job training.

The setup of the system to cover all processes and contingencies for a global organization is illustrated by the fact that the rollout for the British subsidiary was explicitly modeled after prior implementations in other national units, namely Austria, Switzerland, and France. As a result, the SAP package had to streamline regional differences in culture, language, and operating procedures, and introduce an organization-wide standard. It has been described before that participants at the British subsidiary reacted with skepticism to this aspect of the change, as the new system perceivably stood for a generic approach that did not specifically cater for local conditions. The complexity of the system can then partially be ascribed to the global needs it has to serve, while comprising a lot of redundancy or functions irrelevant to particular local environments.

The British subsidiary operated on a computer system that became increasingly outdated and cumbersome to use by the time the change measures were announced. More than ten years old and poorly supported by the original vendor company, the MACH system was recognized by managers and employees alike as in need of a substantial upgrade. For example, MACH could not be operated through a Windows-based user interface, requiring input as textual code. Moreover, there was no direct compatibility with standard Microsoft Office software such as Excel or Access. Consequently, from a user perspective people in the British subsidiary were actually looking forward to a proposed system with enhanced functionality, greater capabilities, and improved user friendliness.

> "The old computer system wasn't very good, and quite cumbersome and slow, and, you know at month's end we had to close down for a day, and those sort of things which were always very inconvenient." (Christine Peters)

> "MACH was not perfect, it was an old system, it was installed here in 1990 I believe, maybe even 1989, probably 1990, so you know it was 11-12 years old. [...] it was basically a defunct system, being supported by a company that was no longer interested in supporting it. So I mean there were considerable concerns about MACH, and I think many people were pleased that we were going to be leaving those concerns behind, moving into something which hopefully would be a lot better supported." (John McGregor)

Following the decision to implement SAP, MACH was gradually faded out in both the customer service and the accounting department. In the latter especially, a dual system was run for three months to ensure complete data migration and smooth processing once MACH was switched off. In sum, users at the British subsidiary agree that de-

spite the complexity of SAP, the new system was an improvement to the operations at R&P UK given the inadequacy and shortcomings of MACH.

Reflecting on the changes to everyday procedures due to the new system, UK employees also emphasize SAP's greater functionality and processing speed first of all. At the same time, their work is still, of course, computer-based, revolving around the same tasks such as order input or the maintenance of customer accounts. Hence, it is more the procedural order of completing a task, and the system tools involved in this completion that account for the main divergence. Even though there are differing opinions on the degree of procedural changes that SAP brought about, largely as a function of individual job tasks, some consensus exists on the nature of the change to everyday procedures not being revolutionary but rather occurring within the same conceptual framework.

> "Uh, the actual day-to-day way of working for most people has not changed nearly as dramatically as the view you just expressed SAP would suggest. Uh, the customer service department does very similar things than the things they did before with MACH. After all what we're doing is selling plates basically, putting orders into the system, making certain peoples' invoice. The actual process there is incredibly similar, the way it's done of course is different because you got different screens, you got different ways of clearing deliveries through and this sort of thing." (Robert Walsh)

The essence of the transition to SAP from a user perspective was then to learn how to both handle a new tool and the steps in a new routine. One German manager pointed out that SAP nevertheless requires many more steps to complete a process, due to its increased complexity. On the basis of the results presented so far it might be assumed, however, that the new technology did not radically alter everyday work procedures nor modify existing interactional patterns or organizational structures, as described in examples by Billings et al. (1977), Barley (1986), or Burkhardt & Brass (1990). Albeit, the latter point deserves more deliberation, since the new system has been shown to act as a catalyst for integration and centralization tendencies. In combination with related findings on learning and resistance, the question of SAP as a modifier of organizational structure will be elaborated in the discussion section.

'Progress' as a thematic category was also found in the documentation. However, the content in the 'new system' cluster in the documents is overwhelmingly technical with the exception of a minority of five quotations on the 'quality' of the new system and the inadequacy of the old 'MACH' system. This reiterates the findings in the inter-

views, where MACH is described as technically outdated and SAP was generally judged a great improvement. All other quotations in this cluster cover technical aspects of the implementation and configuration of the new system.

Again, the category on 'operational project management' was already discussed in section 4.1.2.

One size fits all

Given the findings obtained on the complexity of SAP, the nature of the system integration and setup, and R&P's targeted organization-wide IT architecture, it can be deducted that the new computer system was not implemented with the intention to account for local peculiarities. The IT strategy at headquarters was to build a unified system that serves the needs of the organization globally and facilitates a centralized distribution. Asked specifically about the flexibility of SAP to be adapted to local circumstances once it was implemented, respondents unanimously elaborated on the rigidity of the system. The degrees of freedom of the new technology at the local level appear to lie in a range from very few to none.

> "The program was going to be cast in stone, and any modification would be made in Germany, and it would be made for a global situation. [...] SAP was already in and functioning, they'd written it and it was working before we got to hear about it. We would unfortunately assume that when we came to SAP that we would have a great deal of input and it would be modified to suit our way of working. The answer is no. [...] By the time they came to us, SAP was cast in stone." (Hugh Prescott)

> "The system is the basic system, uh, there's been no as far as I'm aware any special adaptations made for the UK, the only adaptation I suppose is basically the German version of it has been translated into English." (Paul Samuelson)

UK managers complained that any suggestions for amendments could not be made locally, as illustrated before, but require authorization from headquarters. From an immediate user perspective, employees listed several examples where a minor adaptation would significantly simplify a specific process. But when formally requested, such suggestions either stalled in a lengthy communication process or were flatly rejected by central IT. Although UK participants show an understanding of the limitations to flexibility set by a global IT architecture, the inability to institute even minor adjustments is a cause of frustration.

The German participants in the project clearly argue from a position that embraces the company as a whole, and illustrate the shortcomings of the alternative scenario.

> "And you'll need most importantly a structure that is uniform in all markets, which was exactly what R&P didn't have. Everyone had an independent accounting system, everyone tailored something for the customer service, for everything possible, and those were all solutions that were okay by themselves, but they were intended entirely for such small units, and here at headquarters you'd have the biggest difficulties to simply extract the pool of data in such a way that you can later transform it into a meaningful information at all. Therefore it's good that we're all subject to this unified SAP organization, where the emphasis lies on 'unified' and not on 'SAP'." (Manfred Becker)

> "This is actually more of a European solution, [...] that's of course where a certain stiffness come from, and it has to be, otherwise we'll smother again in ideal solutions, and that will show in less cost efficiency. In my opinion the harmonization process needs to be driven further, no question." (Peter Schmitdbauer)

Hence, both sides provide valid arguments in this conflicting issue, but the final setup evidently favors the global solution. With the UK subsidiary being incapacitated to make amendments, and bottom-up feedback on the new system thereby substantially constrained, it must be expected that the way the system was set up had a sincere impact on the dynamics of learning and resistance in the project.

Following the presentation of findings related to the nature of the change project and the new system, the remainder of the results chapter will now focus on awareness of resistance and on learning in the change project at R&P UK.

4.4 AWARENESS

Awareness has been defined in section 2.4 as the mediator between resistance and learning. For resistance to change to function as a source of organizational learning, awareness about resistance was introduced as a necessary condition. The presentation of results so far indicated an emergence of moderate resistance by a single individual. As shown in *Table 3.2* (p. 138), the analysis of awareness of the found resistance will consider three factors, namely existence, intensity, and semantic elaboration. For each level of analysis, data will be presented on whether there was awareness, and if so, how strong it was, and how this awareness was represented in project participants' perceptions. Due to the nature of the obtained data, results at the group level are informed by interview and documentation material, and concentrate on the semantic elaboration of resistance.

4.4.1 Individual level awareness

Insecurity

British project participants unanimously described the announcement of the change as a shock. Although it is generally admitted that there was at least a subtle expectation, given the prior changes in other European subsidiaries, a similar change to UK operations was not perceived to be possible for another three to five years. The assurance of the distant geographic location of the UK market, the logistical problems of crossing the British Channel, and the traditional autonomy of the unit instilled the British groups with an impression of stable conditions for at least the short to medium term. Hence, realizing the magnitude of the change and its ramifications in combination with the fact that it was in essence non-negotiable left the British side stunned. One British manager vividly illustrates the breaking of the news.

> "John phoned on his mobile, to tell me what had happened the day before. And he said 'We were totally shell-shocked'. He said 'I had absolutely no idea it was coming', he said 'In the drive back from Gatwick, when I've picked them up from the airport, Olivier Berg[27] threw a kind of throw away line, 'And of course now with the warehouse closure'', and John's answer to that was 'It took all my self-control not to crash the car. I said could you repeat that?', and Olivier Berg realized that he had said something totally unguarded. We were blissfully unaware that they weren't coming in to discuss future plans for the UK, whether it would be new shops, new centers, new strategies. We weren't aware of what they were coming for, they wouldn't tell us." (Hugh Prescott)

The shock value of the announcement was the same among employees, especially once it became clear which consequences would emerge. Among those consequences the warehouse closure was naturally the gravest to UK employees, as many of their colleagues would be made redundant.

> "With the warehouse closure, that was a real shock, a real shock. I used to deal with the warehouse an awful lot, got on with all the people that were working in the warehouse. It was very, very upsetting at the time." (Susan Parker)

Given the unexpectedness of the change project and the autocratic way of how the decision to go ahead was reached, UK participants became increasingly uncertain about fundamental coordinates of their organization and work. The management in Germany had taken critical steps to reduce the headcount at the UK subsidiary by deciding to

[27] Olivier Berg was a board member at the time who accompanied the German management team to the first meeting where the change was announced. He did not participate in the subsequent execution of the project, but joined on that occasion as a senior manager to provide additional legitimacy.

close the local warehouse. Such a display of willingness to introduce radical change caused great uncertainty amongst the remaining staff about the future safety of their jobs, as further cuts might be expected. Consequently, employees in the customer service and accounting departments began to speculate whether their own job tasks could be outsourced or rationalized. Again, due to the unexpectedness of the change and the intransparent decision process, various rumors circulated and mutual trust suffered.

> "I think [it is important] to fully inform your staff. I think it was obvious that everyone, the atmosphere here, everyone was nervous, and nobody was reassured, and I think that was, I don't know whether that was intentional, or whether it wasn't possible to, you still kind of think that maybe there is something we don't know, so therefore it's best not to say anything. I don't know, but it wasn't a very nice atmosphere to be working in at that time." (Abigail Woolfe)

> "I mean throughout the company there was this feeling of 'God, who's going to be next?'." (Susan Parker)

UK managers agree with their employees about this atmosphere of uncertainty immediately following the announcement of the project. They elaborate on the suspicions held by employees about further downsizing of the subsidiary, as certain accounting and customer service functions could be performed independent of location. But British managers also held considerable uncertainty about the security of their own jobs, given the dismissal of Hugh Prescott and the shifting significance of, for example, the local IT department. It has been mentioned before that this structural change brought about by the project served as a cause of well-founded worries for Robert Walsh and Paul Samuelson.

Confronted with reports of uncertainty at the UK subsidiary, German managers eagerly stress their clear communication at the beginning of the project and their openness and honesty about the strategy for British operations.

> "We clearly told the important people right from the beginning where the journey would go. And especially in the IT area it was said perfectly clear what we were expecting there, yes, and who'd stay, and this insecurity we tried to take away from people." (Heinz Berwanger)

Hence, there are contrasting remarks about the level of uncertainty or the justification of its existence. This can presumably be related to the damage of trust in the relationship with headquarters as a result of the decision making process. The issues of trust and open communication will be revisited further down with the results on learning. The shock value of the change announcement and the ensuing uncertainty and lack of trust would hold the potential to profoundly influence learning dynamics and provide an im-

petus for resistance. It was shown, however, that resistance only emerged on a very limited scale. Nevertheless, the situation did warrant a heightened sensitivity for critical responses.

Adding to the uncertainty about their jobs was an anxiety among British participants whether they would be able to handle the new system. Introduced as state-of-the-art business software to the UK subsidiary, SAP R/3 was received as a seminal modernization with impressive capabilities. However, such capabilities are based on a myriad of functions and processes that would seemingly require insightful mastery. UK employees reacted to these anticipations with considerable anxiety, since they would have to spend the majority of their time working with the new system. Worries centered on the ability to manage working with SAP.

> "I think some, the operation of the computer system was of concern to some because they didn't think they were very good at it, and they were worried about, you know, how to read the screen, and how to do things, I think one or two were quite worried about that." (Christine Peters)

As illustrated by the above quote, anxiousness levels did not seem to be critical, but rather reflected a general unease about whether personal abilities would match the learning requirements of the new system. The UK staff was thoroughly familiar with operating computers, and the challenge lay solely in becoming proficient in the new software package. British managers, who themselves use SAP on a daily basis, empathize with their staff about the initial concerns, but similarly do not overrate anxiousness levels. When speaking for themselves the managers report a somewhat proactive reception of the new technology. Finally, on the basis of their experiences with prior implementations, German managers appreciate users' worries accompanying the introduction of the new system. At the same time they remark that adopting SAP as a user is not an insurmountable task, a mindset that they felt was largely shared by British participants.

Resistance is futile

Once the change was announced, people at the UK subsidiary developed diverging expectations about the future of their workplace. The managers in retrospect concur on the notion that their expectations were generally positive, and that they hoped for an immediate improvement to their operations.

> "I believe that we were, many of us in particular, different groups in different environments, but we were generally looking to get a lot from the change." (Robert Walsh)

A potential of the planned measures to fundamentally alter the way the subsidiary worked was recognized and, for the case of the software implementation, was perceived as an opportunity for progress.

The employees showed a less unanimous opinion in their accounts of initial expectations. On the positive end of the scale, the same kind of positive anticipation about a system that was going to make their jobs easier was reported. There were, however, also some negative expectations centering on the notion that computers might soon take over their work. Others simply anticipated increased stress levels since the change would be implemented without a halt to the running operations. Hence, employees' expectations before the change project really started seemed to have been more negative on the whole than those of their managers.

Distinct from expectations, a general change attitude in relation to the project was also coded for. Answers in this realm are of course related to the change at the subsidiary, which is why German managers elaborate less about themselves than about their British colleagues. First of all, a universal necessity to continuously change, even an inevitability, is recognized by the German side. It is how the world works, as is stated, and R&P has to adjust to its competitive environment. This 'law of nature' German managers believe was largely accepted by UK managers. Moreover, they reckon that the British team also acknowledged advantages the change would bring and therefore refrained from becoming emotional or acting irrationally.

> "John McGregor, he's also, he's recognized that it also has advantages and he has, I would say, put aside emotional issues relatively quickly." (Heinz Berwanger)

It should be noted that this type of attitude was postulated for the whole subsidiary with one exception, namely the head of the local IT department, Robert Walsh. Awareness about Walsh's resistance is confined to German and British managers, but is voiced most explicitly and unambiguously by the German side.

> "In most areas [it] was basically unproblematic, where everything was seen very objectively and where the loss of certain liberties was simply balanced against the positive things that accompany the whole thing, there we actually had no problems, that needs to be said definitely. Uh, in the whole management, there is one exception, which is the IT topic, where he has massively, massively worked against it and boycotted it in part." (Heinz Berwanger)

As shown in the results section about the British IT department, the local IT manager was assessed as a difficult figure in the change, one that had to be brought back in

line on several occasions by headquarters. Walsh's negative change attitude and reported suboptimal cooperation is attributed entirely to his personality and the consequences the SAP implementation had on his position. There is not a single consideration whether his critical stance might be based on founded concerns or be justified by inadequacies of the implementation process or of the new system itself. German managers utilize adjectives such as stubborn or peculiar to describe him and explain that he was an obstacle that needed to be overcome.

> "I mean, you can tolerate [his behavior] for a while, but at some point you'll say, well, up to here and no further. Yes? It's either going to happen with you or without you. Yes? And we had to make this clear to Robert Walsh several times." (Heinz Berwanger)

The analysis here shows that irrespective of whether Walsh's reluctance was justified by anything else but self-interest, there seems to have been no attempt to look for possibly constructive reasons for his stance. His behavior was not probed for valid substance. All remarks about him from the German side highlight mainly his stubbornness. Hence, irrespective of whether Walsh was right or wrong, there seems to be a *pathologization* of his resistance. It is marked as unfounded, unjustified, and plain unnecessary. As a result, there was individual level and group level awareness about a single resisting individual, but this resistance was construed as dysfunctional.

The managers in the UK perceived the upcoming development as inevitable, based on a resignation about the decision-making authority at headquarters. The comments in this realm seem not so much to reflect a wholehearted embrace of the underlying motives for the change, but rather a rational assessment of the power structure within the organization. Such resignation by UK managers might be understood as a factor facilitating a lack of resistance to the measures imposed on the British subsidiary. Moreover, such resignation might also thwart awareness about their colleague's resistant behavior, or facilitate a construal thereof as individual stubbornness.

> „However, we were also resigned to the fact that it was going to happen and we had to make the best job of it that we could, there was no point fighting against it because it was going to happen whatever we said or did." (Kevin Franks)

> "I think in a way everyone was initially resigned to the fact this is going to happen, we can't stand here and say we don't want it because we are part of R&P and R&P have agreed it's the worldwide system. So, there is no point trying to defeat something, which is undefeatable." (John McGregor)

Employees tend to emphasize arguments similar to those of the German managers, namely that change is a natural and frequent occurrence, and that they had to 'go with the flow'. Their perceived role was to adhere to the project plan devised at headquarters.

> "You can't sit down and say, well I don't want to change, or my job should not change, my client should not change. Well, they do. You know, your job will be redefined inevitably, it always will." (Christine Peters)

> "We didn't have a choice, you know? We didn't have a choice saying no we didn't want it, it just appeared, it was going to happen, and, uh, you'd have to deal with it. [...], but we had no option but to accept it. You know, no matter what you thought yourself." (Jane Adams)

It was previously shown that, with the exception of a single individual, there was no explicit and noticeable emergence of resistance within the change project at R&P UK. Under the thematic code 'resistance' potential remarks about such emergences were coded for, most often following a direct question whether respondents had witnessed or taken part in any resistance throughout the project. Hence, the reconstruction of this topic from the perspective of internal observers culminated in an immediate confrontation with the core issue.

German managers were quick to point out that, except for the one critical British IT manager, cooperation was satisfactory and no episodes of resistance arose. According to their responses resistance among British participants, if extant at all, only expressed itself in a somewhat emotional aversion.

> "I think there was more of an emotional initial problem, but as I said before, the people are internationally oriented and overcome something like that quite quickly." (Manfred Becker)

UK managers additionally deemphasize Robert Walsh's behavior and agree with their German colleagues that there was no resistance in their own domain. One manager even expressed mild surprise over the fact that the workers in the warehouse took the news about the change and consequently about their dismissal extremely well.

> "I think [people] may have at times been less cooperative than they could have been, and that's a lot different from being resistant. No one obstructed the process; no one tried in any way, shape or form to do derail it. [...] The UK went very well, there was no resistance in the UK. The individual staff in the UK did not resist." (Hugh Prescott)

Similar responses about a general absence of resistance in the project are found among UK employees, who mostly dismiss the notion of resistance in favor of such alternative descriptions as anxiety or uncertainty.

> "[There was] not really a resistance, more anxiousness. Anxious that you should be able to perform the new things, [...]. Not a resistance, not really, no. I wouldn't call it resistance. We were all a bit surprised when they said the warehouse was going to be closed down, but there wasn't the sort of thing that anybody got angry and said they mustn't do that." (Christine Peters)

These responses give an impression of an understanding of resistance among project participants as an 'all or nothing' phenomenon, as some severe set of actions that would have fundamentally endangered the project as a whole. Especially Hugh Prescott's quote reflects this perception, which does not consider resistance to be anywhere similar to critical assessment or constructive disapproval. The possibility that such a negative image of the concept of resistance might have biased respondents and led them to not recognize the full spectrum of the concept, including functional resistance, will be examined more closely in the analysis of the repertory grid results.

In sum, awareness of resistance at the individual (and group) level appears to have been largely confined to German managers, who construed the behavior of a single resistant individual as dysfunctional. Managers and employees at the British subsidiary expressed little awareness of resistance. To them, resistance was futile or did not seem like a meaningful exercise for a number of reasons. First of all, despite some moderate anxiety about an increasing dominance of computers, expectations about the project once it was announced were generally rather positive. Change recipients recognized that the UK subsidiary's operational procedures were outdated and that the company was moving towards higher efficiency through integration. Secondly, once the project was announced change recipients resigned to the apparent inevitability of the change. Thirdly, change recipients also acknowledged that SAP R/3 was by and large an improvement to their operations. These facts make a reasonable case against resistance of the destructive and dysfunctional type, but do not necessarily preclude an emergence of a constructive and functional type of resistance. As stated earlier, for example, critical assessment of the new system seems to have been absent almost entirely. Additional factors that play a role in stifling any resistance can be found in the company's hierarchy and top-down power relations. These contextual factors seemingly influence employees to not consider an impeding form of resistance as an option, while they also hold the potential to function as a disincentive to constructive resistance such as critical feedback.

4.4.2 Group level awareness

As shown in *Table 3.2* (p. 138), the obtained information about awareness of resistance at the group level is largely centered on the semantic elaboration of resistance. From the interview data it can be assumed that awareness at the group level was seemingly confined to German managers, who communicated with one another about Robert Walsh as the resistant individual. There is no evidence of group level awareness in the documentation. The interview findings suggest that informal communication at headquarters constituted the essence of group level awareness. Hence, awareness at this level of analysis existed, albeit with low intensity and only among a specific group. In the following, the semantic elaboration of resistance among project participants is explored.

Repertory grid results

The repertory grids for groups one, two, and three[28] are shown in *Figure 4.4*, *Figure 4.5*, and *Figure 4.6* below. Elements (columns) represent different manifestations of resistance produced by the respondents, constructs (rows) stand for different dimensions generated in the triadic comparisons and used to cognitively organize the elements. The three groups generated a 8 × 9, a 9 × 9, and a 8 × 8 matrix, respectively. These were then filled out with ratings on a seven-point scale, where any rating on a construct could be given to more than one element. For example, group 1 rated the element 'discussion with managers' as the most constructive element on the dimension 'destructive-constructive', and the element 'decreased performance level' as the most pessimistic element on the dimension 'pessimistic-optimistic'. The ratings are highlighted according to their magnitude with different background patterns.

[28] The repertory grid for group 3 (German managers) was conducted in German and subsequently translated by the author.

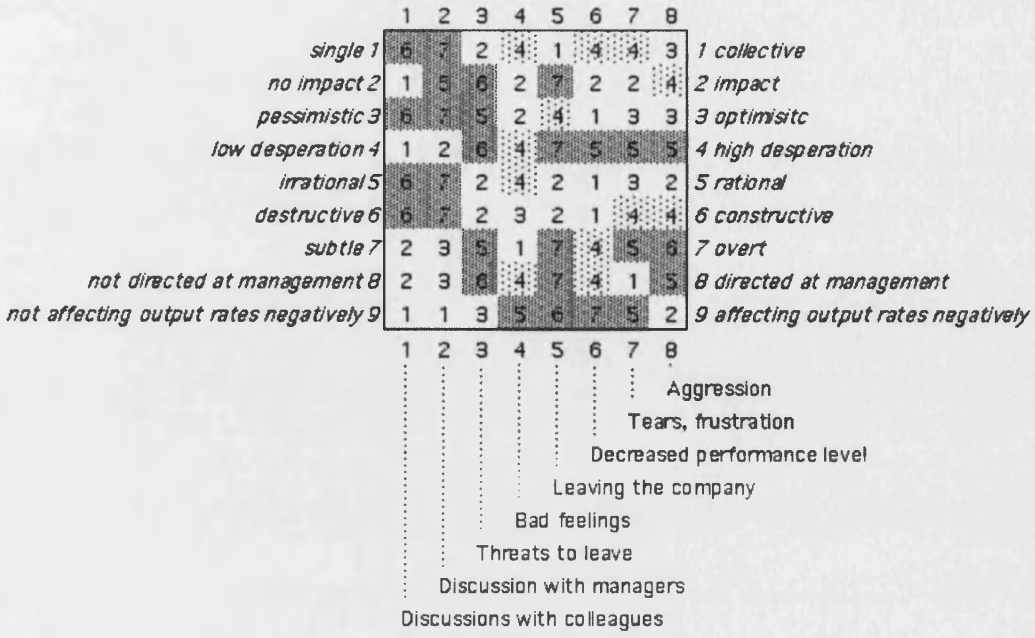


Figure 4.4: Repertory grid of group 1 (UK employees)

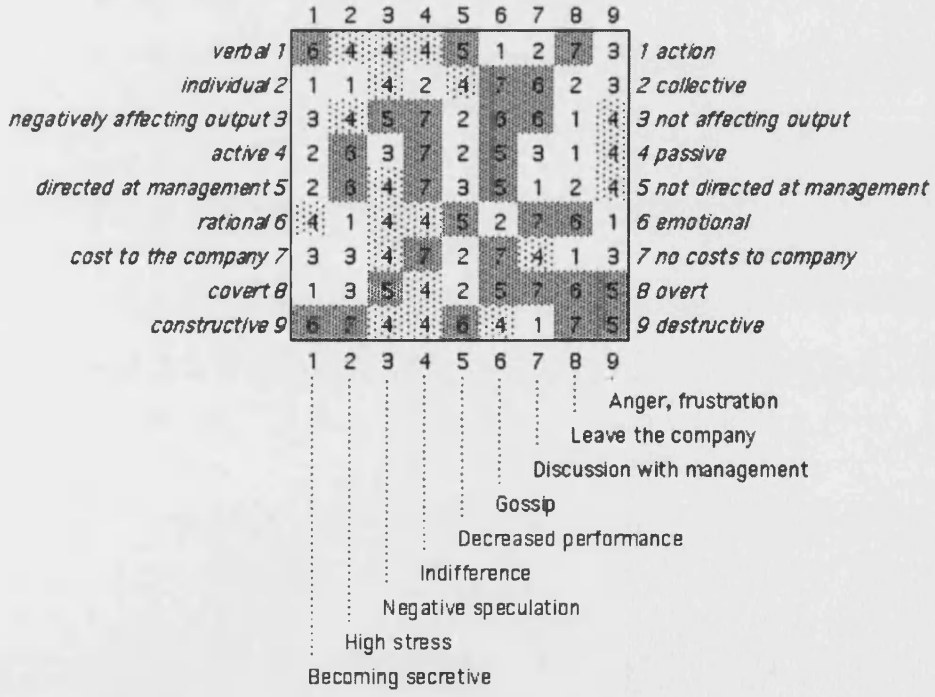


Figure 4.5: Repertory grid of group 2 (UK employees)

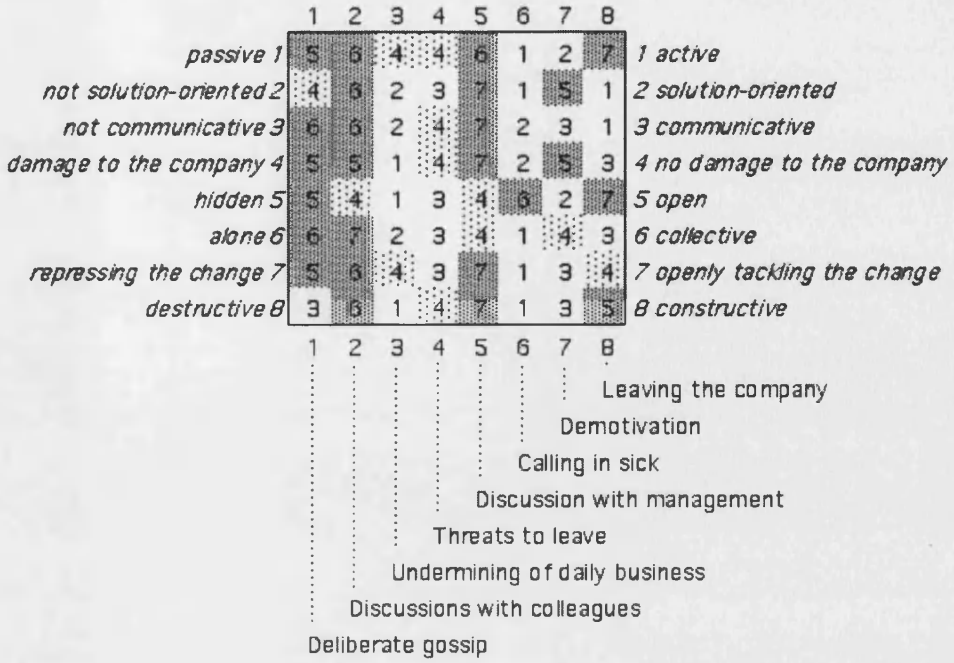


Figure 4.6: Repertory grid of group 3 (German managers)

The initial qualitative analysis focuses on the generated elements first. It can be seen that respondents produce largely similar elements across the three groups. Without

In sum, the three groups largely converge on their ideas about how resistance to change is expressed in work situations. The conspicuous exception is the inability of German managers to recognize any emotional aspects of resistance. Except for discussions, the remaining elements for the managers' group exclusively portray resistance as a more or less rational act of supposedly bad intentions. For all three groups the only inherently constructive forms of resistance named by respondents are discussions with management and colleagues. All other manifestations have either a strongly emotive character, show little rational problem orientation, or are downright destructive. Hence, the majority of manifestations reflect a dysfunctionality of resistance.

The elicited constructs show a comparable degree of similarity across the groups. Several constructs can be found in all three groups, albeit with a slightly different wording. Resistance may be expressed by individuals or the collective (also 'single-collective', 'alone-collective'), in a hidden or open fashion ('subtle-overt', 'covert-overt'), or in a passive or active way (probably also 'no impact-impact'). Respondents also share a structuring dimension relating to the quantifiable, observable damage resistance might inflict on an organization ('not affecting output-affecting output', 'cost to the company-no cost to the company', 'damage to the company-no damage to the company'). Further, a dimension about the functionality or future utility of resistance is shared ('destructive-constructive', 'pessimistic-optimistic', 'repressing the change-openly tackling the change'). This latter dimension seems to hold a conceptual centrality given the prior discussion in the theory chapter on resistance. Particularly the construct 'destructive-constructive' reflects the fundamental cognitive distinction between resistance as a functional indicator or as a dysfunctional nuisance. Three more sets of constructs are specific to certain groups. The two employee groups share emotional dimensions ('low desperation-high desperation', 'irrational-rational', 'rational-emotional'), which are again absent among the managers. In addition, the employees have in common a hierarchical dimension ('not directed at management-directed at management'), which managers are lacking. Group 2 and 3, UK employees and German managers, on the other hand share a communication dimension ('verbal-action', 'not communicative-communicative') that is not shown by group 1.

In sum, there is again a convergence between the groups in how they structure the resistance concept. All groups of respondents utilize the degree of collectivity ('single-collective'), activity ('passive-active'), visibility ('covert-overt'), and constructiveness ('destructive-constructive') as structuring tools, with the latter dimension occupying a

central theoretical position. Again, the managers disregard the role of emotional influences. They also do not produce a hierarchical dimension, possibly because they perceive resistance as always directed at management. This assumption would reflect an 'observing the other' perspective on the phenomenon (see section 2.1.5, p. 91), but is hard to verify based on just the found absence. It is finally interesting to note that the shared dimensions on potential damage to the company do not have a truly positive pole. The most positive outcome of an episode of resistance would be that it does not affect output rates negatively, inflicts no cost to the company, or results in no damage to the company. The possibility that resistance might lead to increased output rates and profits to the company, as implied by the constructiveness pole, is not considered. Consistent with the element findings above, the omitted genuinely positive construct poles on the outcome dimensions indicate a prevailing understanding of resistance as a deficit concept.

In the second step of the repertory grid analysis, descriptive indicators are calculated to illustrate the relationships between the elements and between the constructs, respectively. All computations in this section are done with the statistical software package SPSS (Norusis, 2004), and the output can be found in Appendix I. First of all, means, standard deviations, and skewness scores are calculated for the constructs to detect rating tendencies and outliers. As for the latter, there are no means that diverge from the natural mean of four on the seven-point scale by more than one standard deviation. The largest mean of 4.88 is found for group 2 on the construct 'constructive-destructive', indicating that this group leaned towards the destructive end of the scale when rating its manifestations of resistance. The skewness score shows how much the obtained distribution of ratings varies from the normal distribution. In general, a skewness score greater than twice its standard error signifies an asymmetric distribution. None of the distributions for the present grid dimensions are seriously skewed. The most lopsided dimensions are 'irrational-rational' for group 1, 'constructive-destructive' for group 2, and 'passive-active' for group 3. The stronger emphasis in the first two cases is towards the negative construct pole, and in the third case towards the active pole. This means that on the whole, the named manifestations of resistance are seen as rather destructive, irrational, and involving activity.

Pearson product-moment correlations reveal the strength of the interrelations between elements and between constructs, respectively (see Appendix I). The correlations

discussed in the following are significant at $\alpha = .01$. Observing interrelationships between constructs first, group 1 associates individual (as opposed to collective) resistance and irrationality with high desperation, and rationality with constructiveness. Group 2 perceives active (as opposed to passive) resistance as directed at management, and, logically, negative effects on output as related to costs to the company. For group 3 communicative forms of resistance are seen as solution-oriented, while a lack of solution orientation is related to damage to the company. Apparently, the positive or generally constructive and solution-oriented type of resistance seems to be connected to rational and communicative behavior. The interrelations for the elements show significant coefficients that would mostly be logically expected. Group 1 hence perceives a similarity between discussions with colleagues and managers, and between threats to leave and actually leaving the company. In addition, people who leave the company are seen as very unlikely to engage in discussions with managers and colleagues, and decreased performance levels are similarly unlikely to be a topic of discussion with superiors. Group 2 does not see high stress being discussed with management. Group 3 disassociates calling in sick with discussions with colleagues. Hence, the correlations among elements reveal obvious associations and no surprises.

In sum, there is limited information to be gained from the numerical indicators so far. No considerable differences between groups are found. There is a slight bias on the skewness and mean scores towards the negative and dysfunctional construct poles, reaffirming the perceived dysfunctionality of resistance found earlier. The correlations mostly reflect the obvious.

The occurrence of clusters of fairly high correlations in all four tables above leads to the assumption that a summary representation could give a clearer picture of groupings of constructs and elements. Therefore, the third step of the analysis focuses on spatial representations of the obtained data and the underlying structure of the grids. Here, the grid data is factor analyzed using principal component analysis. This illuminates how elements and constructs are related to each other. Factor analysis requires the source data to be two-set similarity data, as explicated by Coombs (1964). The term 'two-set data' in the context of the repertory grid corresponds to the relationships between constructs and elements, as opposed to one-set data as in the relationships among either elements or constructs. The term similarity pertains to the ratings in a grid indicating the degree to which an element is close to a construct pole. Moreover, principal

components analysis requires at least an ordinal level of measurement, with the data for the present grids being on an interval scale. Hence, the chosen factor analysis is appropriate to the grid data (Bell, 1988), while multidimensional scaling as an alternative would also be a feasible method of analysis. Although the regions or clusters generated in an MDS solution are not directly related to the factors in a PCA solution (Borg & Groenen, 1997), for the purpose of identifying simple relationships between elements and constructs in a grid the two methods essentially produce the same kind of results (Bell, 1988). Despite the fact that multivariate techniques such as factor analysis typically require large sample sizes for the purpose of generalization, the use of such methods for the discovery of underlying patterns within the data does not necessitate extensive samples (Reger, 1990). *Figure 4.7*, *Figure 4.8*, and *Figure 4.9* below show the unrotated two-dimensional factor solutions on the covariance matrix for the constructs and elements in the three obtained grids. For the graphical output WEBGrid-III was used, an internet-based specialized tool for repertory grid analyses (Gaines & Shaw, 2001). Here, a point convention for elements and a vector convention for constructs is adopted. The construct directions are plotted as lines through the construct means with a length proportional to the construct loadings. Essentially the constructs are considered in their normal and reversed form; that is, the initial construct vector is projected back through the original to an equal length. For example, for the construct loadings x and y that function as coordinates, a line would be plotted from (x,y) to (-x,-y). All numerical indicators relating to the PCA solutions, such as eigenvalues and factor loadings, can be found in Appendix I[29].

The PCA solution for the employee group 1 shows a somewhat even distribution of elements and constructs. First of all, none of the constructs lie particularly close to the origin, indicating that they are reasonably well defined by the two components. As for elements, the two generated principal components seem to define the elements 'aggression' and 'tears, frustration' less well. The first two components explain 87% (62%+25%) of the total variance, which means that the original data are adequately represented by a two-factor solution.

[29] Appendix I shows the SPSS replication of the WEBGrid-III calculations. WEBGrid-III was used for its graphical output functions, while all numerical indicators were replicated with SPSS.

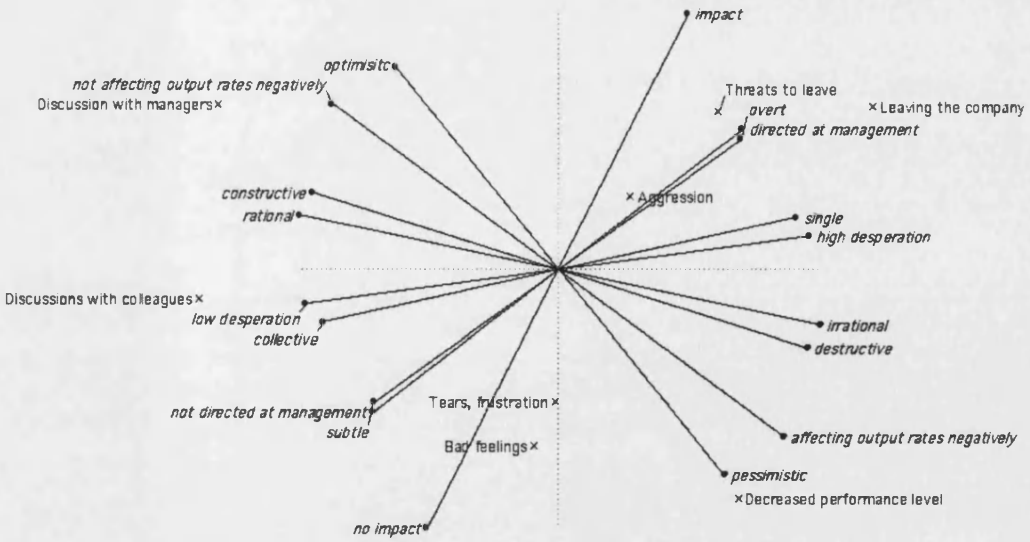


Figure 4.7: PCA solution for group 1 (UK employees)

The constructs mainly build a fan of lines around the first component, which makes it hard to educe a common component label. 'Impact-no impact' is the only construct relatively close to the second component. There are four sets of constructs that show close proximity. Overt actions are understood as directed at management, and resistance expressed by an individual is associated with high desperation. These four dimensions lie closest to the first component. Moreover, constructive resistance is construed as rational, and generally optimistic forms of discontent are believed to not affect output rates negatively. There are fewer element clusters. Respondents perceive 'tears, frustration' and 'bad feelings' as similar, although those two elements and 'aggression' are less well explained by the two-component solution. 'Aggression', 'threats to leave', and 'leaving the company' are also in relatively close proximity. These latter, rather drastic, expressions of resistance are understood as overt and directed at management. They mostly involve single, desperate individuals and are believed to make an impact. Emotional expressions of resistance on the other hand are not seen as having a lasting effect. At the constructive and rational region of the scale respondents locate 'discussions with managers' and 'discussions with colleagues'. These manifestations are con-

lieved to have an impact, while at the same time being somewhat desperate, irrational, and solitary. The other one corresponds to a constructive, discussion-oriented type of resistance that holds optimistic and rational connotations and usually involves more than one individual.

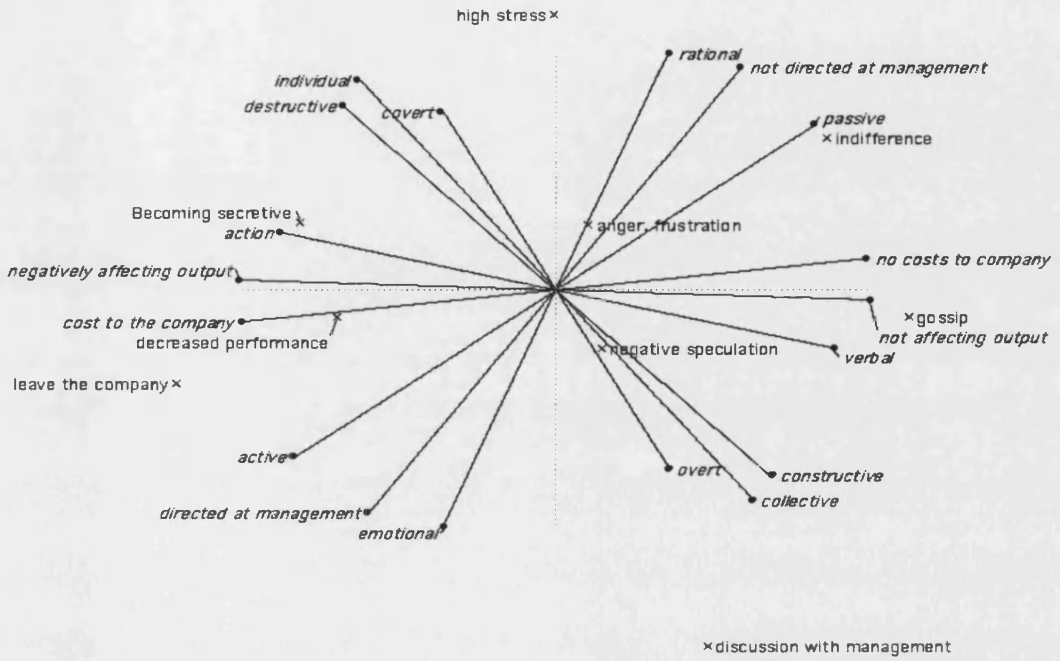


Figure 4.8: PCA solution for group 2 (UK employees)

The graphical output for group 2 gives a similar first impression to the one for the first group, with an even distribution of elements and constructs, and no discernible concentration around either axis. The elements 'anger, frustration' and 'negative speculation' appear less well defined by the two-component solution. The first two components explain 80% (48%+32%) of the total variance.

Again, four sheaves of constructs can be recognized, and they are associated with different elements. The employees in group 2 see 'indifference' as passive, not directed at management, and, surprisingly, rational. 'Becoming secretive', 'decreased performance', and 'leaving the company' are perceived as involving activity, negatively affecting output, and inducing cost to the company. The same three constructs are related to 'gossip' on their alternative pole. In between the three named clusters lies the set of constructs in which constructive resistance is seen as collective and overt. The element 'discussions with management' can be connected with these element poles, but it also

loads very high on the second component. Another element that is equally well explained by the second component, albeit on the opposite end, is 'high stress'.

In sum, the spatial representation in this case is again more informative than the component solution. However, one can discern a dimension of tangible, concrete, and mostly damaging action fanning out around the first component. The elements 'high stress' and 'discussion with management' are comparative outliers best explained by the second component.

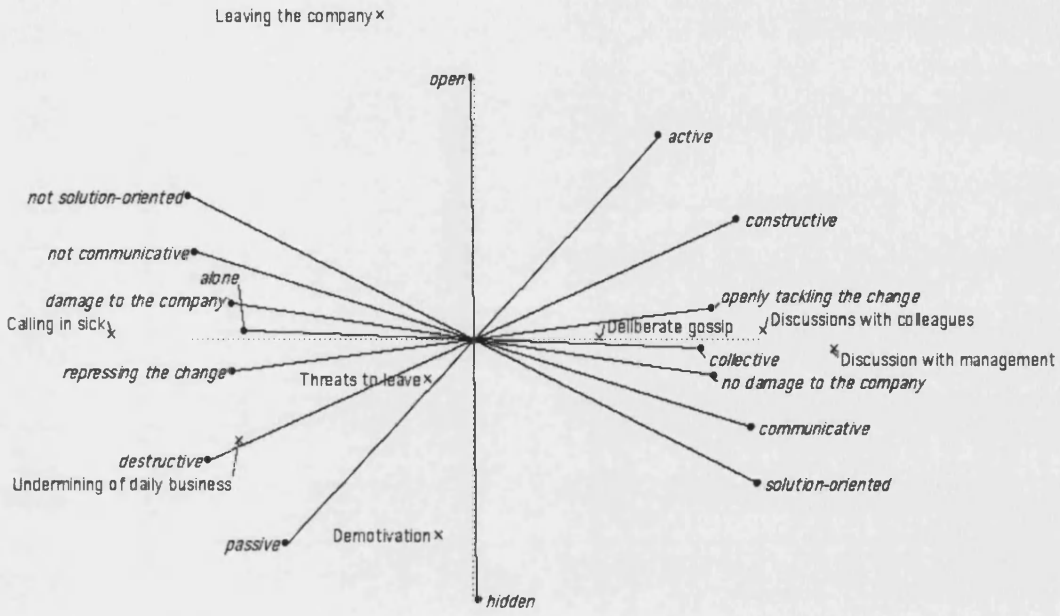


Figure 4.9: PCA solution for group 3 (German managers)

The data produced by the German managers in group 3 differs from the first two groups in that the PCA solution is more strongly dominated by the first extracted component. With one exception, all constructs scatter around the x-axis. The elements 'threats to leave' and possibly 'deliberate gossip' are less well explained by the factorial solution. The first two components explain 82% (64%+18%) of the total variance.

There are two clusters to be found at either end of the first component. The German management sees 'discussions with colleagues' and 'discussions with management' as constructive, solution-oriented, openly tackling the change, communicative, and inflicting no damage to the company. In contrast, 'calling in sick' and the 'undermining of daily business' are associated with the opposite poles of the said constructs. The construct 'hidden-open' is apparently extremely well defined by the second component. Related to the two poles of this construct are two relatively isolated elements.

'Leaving the company' is construed as an open act, in contrast to 'demotivation', which is rather hidden. The construct 'active-passive' does not seem to fit well into either component realm.

Hence, the first component describes a distinction between a generally constructive and discussion-oriented form of resistance that German managers perceive as rather positive, and a destructive, secretive form of resistance. Interestingly, the positive type of resistance is believed to not damage the company. Solitary structuring dimensions are the degree of activity and openness. Isolated types of resistance are 'leaving the company' and 'demotivation'.

In sum, all three groups exhibit a basic differentiation between two types of resistance. One type centers on discussions and is characterized as constructive, open, rational, optimistic, and solution-oriented. This positively laden type of resistance is associated with collective action. On the opposite is a resistance of a withdrawing and introverted nature that is characterized as destructive, desperate, inflicting cost to the company, and non-communicative. While the German managers see the positive type of resistance as proactive and useful, this relationship is not so clear for the employees. In fact, group 1 construes the negatively laden type of resistance as having more of an impact. Moreover, the managers seem to have a somewhat more coherent representation of resistance. Lastly, the emotional manifestations that are exclusive to employees are not well captured by the PCA solutions, indicating a potential additional, emotive component.

Overall, the findings from the repertory grid analyses show that resistance is an unclear and ambiguous concept for the project participants. On the one hand respondents recognize a constructive, functional type of resistance. On the other hand a dysfunctional image of resistance is reflected by the fact that the majority of elicited elements is negative. In addition, most of the constructs do not express any genuine potential for improvement. Indicative of this are positive construct poles such as 'not affecting output rates negatively' and 'no cost to the company'. Moreover, resistance was never directly associated with learning. German managers, the only group explicitly showing awareness of resistance, do seem to recognize a useful type of resistance. The existence, intensity, and outlined semantic elaboration of their awareness of resistance in the project in principle have the potential to function as a source of learning. However, for the actual case of a resisting local IT manager, his behavior is pathologized. As

a result, there does not seem to exist any swift reconciliation between the idea that resistance might in principle be functional and the actual practical implication of improvement and learning as a result of resistance in the project.

4.4.3 Organizational level awareness

The data source for awareness at the organizational level is the project documentation. It was intended to use the thematic code 'resistance' to account for any content pertaining to formalized awareness about resistance. However, resistance was not mentioned in the documents. There are no quotations that can be assigned to this code, and the code frequency is zero (see Appendix J and L). As indicated earlier, the vast majority of the content of the project documentation is of a somewhat technical nature, labeled here as operational project management (see section 3.4.7, p. 157). While the topic of learning still received some attention in the formalization process, the topic of resistance is absent in the documents. Therefore, awareness of resistance seemingly did not reach the organizational level.

4.5 LEARNING

Learning is the last component of the research focus in *Figure 2.2* (p. 110), and the emphasis of the present study is on learning as a result of resistance and awareness thereof. The findings so far reveal moderate resistance at the individual level by a single British manager, awareness of this resistance at the individual and group level by German managers, and a semantic elaboration that basically denounces this resistance as an individual dysfunction. In the following, data are presented to assess to what extent the detected awareness functioned as a source of organizational learning. Moreover, it is examined whether the learning in the change project reflects the processes described in the proposed procedural framework of organizational learning. Since organizational learning involves three levels of analysis, the presentation is split into three sections.

4.5.1 Individual level learning

Selling SAP

In the previous sections it was shown that after the shock caused by the initial announcement of the change, a combination of uncertainty about job security and anxiousness regarding the ability to handle the new system caused insecurity among British participants. Such insecurity could be expected to provide a condition opportune for resistance to occur (George & Jones, 2001). After all, during the time period immediately following the announcement of the change, when the downright negative consequences of many layoffs became known, British participants were not yet fully aware of any advantages of the new system. In addition, further negative aspects such as a decrease in independence and a more centralized organizational structure could be expected. Hence, an emergence of resistant attitudes or behavior would not have been a completely unfounded reaction. However, it was shown that little resistance occurred.

Interestingly, regarding the cohesiveness among British participants, the findings reveal a distinct split of roles between managers and employees at the subsidiary, who could have in principle stood united against the German initiative. Here, UK managers did not function as intermediaries, but as a direct extension to the chain of command from headquarters. Instead of critically appraising the prescribed measures, they readily accepted and handed them down to their employees. The attribute that makes their behavior distinctive is the 'sales approach' with which they address the staff in the customer service and accounting departments. When introducing SAP, UK managers emphasize their efforts to 'sell the system' to their staff, that is, they highlight the advantages and neglect any critical comments.

> "I think the good thing that we did from our point of view was that we sold SAP, I think, particularly well to our people. [...] And I was able, with quite a good deal of confidence, I was able to sell the SAP system as a distinct advantage over the old MACH system that we had. [...] From memory, I think we were able to sell the SAP system pretty well to people. There was virtually no negativity about the SAP system." (Kevin Franks)

> "I think we'd sold them the advantages that, the fact that things changed, it didn't bother them, I think they saw the advantages for the advantages they were, they recognized them and they were happy for their work to change." (Kevin Franks)

The sales approach is a strong indicator for the lack of interest in any critical assessment of the new system. End users were not expected or encouraged to profoundly

probe for the advantages and disadvantages of SAP, but to embrace the technology without much reflection. The employees support this analysis by stating that the system was described to them as a stellar improvement that would soon become industry standard. The communicated nature of the system as state-of-the-art would therefore make any end user feedback unnecessary. UK managers seem to have felt that a seamless implementation would be the key criterion for the evaluation of their project efforts as a success, and the positive feedback they received from headquarters about this, as was presented earlier, proved them right. The assigned objective was not to challenge, but to conform. The UK subsidiary was the fourth national unit to adopt SAP. Any local deviation from the predetermined way the system was going to be implemented would be limited by the unified system architecture and a determination to 'harmonize' across the entire organization.

It must be noted, however, that while UK managers laud their own selling efforts, the very same approach is resented when applied to them from headquarters.

> "I would've just like to have known at the beginning, look this is coming rather than this is one of the advantages of the system. What they did is they used [a forecasting function] as a way of selling the system, whereas in fact it would have been better to tell the truth and say, look this doesn't work yet, but when it does work it's going to be great." (Kevin Franks)

As can be seen, the German management appears to have employed the same strategy of emphasizing advantages to persuade local managers. The contradiction lies in the UK executives' objection to the strategy when on the receiving end, but their confident administering of the very same approach to their employees. This could be interpreted as reflecting the distinctively hierarchical culture of the organization, where the flow of information is filtered when passing the boundaries of hierarchical levels.

The sales approach conceivably decreases employees' potential for critical assessment of SAP R/3. Moreover, it decreases their capacity to recognize the beneficial effects of a critical assessment. This has strong implications for learning, as it must be suspected that a disinterest by management in bottom-up feedback would stifle learning behaviors such as active evaluation or the generation of improvement suggestions. Further regarding the sales approach, it should be noted that people were not actively deterred from being critical, but rather that the company culture and expectations for appropriate role behavior apparently did not encourage employees to do more than simply accept the change.

> "You now need far more people that go with the procedures brought down, have a minor input. Whatever comes down from Germany has already been settled into the path they're going through. And therefore people who do challenge, their return is not necessarily good. And that's not good for the company culture." (Hugh Prescott)

To keep the analysis of the sales approach in perspective, the question at the subsidiary was certainly not whether to accept the new system or not, as compliance with the implementation decision was unmistakably requested from headquarters. Also, SAP as a whole was an improvement in comparison to the older MACH system, as all British participants agree. But the question could have been one of making an already good tool even better, and of critically assessing a technology that fundamentally alters the way the unit works. It is assumed that such possibilities for learning were blocked by the sales approach.

In sum, it seems that by selling SAP to both UK managers and employees a potential for resistance to emerge was evaded, which also led to a lack of awareness about the possibility for criticism or resistance, and in effect to a resulting absence of learning. Any adaptation of SAP to local circumstances was not put up for discussion with end users, whereby any possibly productive resistance was denied a forum. With resistance annulled, critical end user assessment and hence a chance for bottom-up improvement was lost. The sales approach appears to have set the agenda for a slick implementation, in which improvement and adaptation was not an option. Hugh Prescott's earlier quote about the exclusion of individuality and the subsidiary's development towards becoming a copying machine rings true, as the centralization and standardization efforts seem to build a strong potential for stifling local initiative in favor of centralized planning. Any learning from resistance is precluded, if resistance is smothered or pathologized, and awareness obstructed. There was resistance at the individual level by a single manager, and there was awareness at the individual and group level, confined to the German participants and construed as dysfunctional. However, learning as a result was not reported.

Given the described semantic elaboration of resistance, the only learning that could plausibly be expected would be avoidance learning. This assumption will be elaborated in the discussion chapter (particularly in section 5.1.3). Individual level learning was identified as a necessary precondition for group and organizational level learning. Therefore, if learning by resistance did not occur on the individual level, it can

be assumed not to have occurred at higher levels of aggregation either. As a result, the remainder of the learning section will focus on procedural aspects of organizational learning as described in the proposed learning framework, while the data are still probed for evidence of learning from resistance.

Insufficient training

The word count analysis showed the code 'training' to be the most dominant in terms of magnitude of respondents' comments. The training as the first point of contact for employees with the new system proves to be a decisive factor in the learning effort and for the acceptance of the new software. From a learning perspective, the largest gains on individuals' learning curves should be made during the initial training phase. The training itself was originally conducted in a lecture format by members of staff from headquarters, especially Sabine Fischer. After a first training session for the British management and two employees (declared key users) at the company's main premises in Germany, the intention was to have these participants train their colleagues after their return to the subsidiary. Following requests from British users, the lecture style was quickly abandoned in favor of a more practical training on a mock system. This revised training version was then repeated at the British location for end users there.

UK managers were very vocal in their expressions of dissatisfaction with the training in general and with the inadequacy of particular aspects in specific. The criticism centered on the formal, theoretical training style favored by the staff responsible at headquarters. Instead of a deductive overview of the capabilities and scope of the new system, British managers preferred a practical demonstration of relevant tasks and procedures. The managers at the subsidiary also felt that the training documents were largely irrelevant, and they were astonished by a time frame for the entire exercise that was far too short in their view. The total training time varied for different users, but in general was not more than three to four occasions of a few hours each, which had to be completed in addition to the regular workload.

> "The initial training was how systems and procedures were going to work, were very frustrating, ill-prepared for, [...] badly documented, and too many times questions asked would be brushed aside or 'we'll look into it and get back to you', and we'd have to fight for an answer." (Hugh Prescott)

> "We actually ended up having to rewrite the whole manual ourselves doing lots of screen dumps, going through sequences of this is how we believe we actually do it." (Robert Walsh)

The dissatisfaction with the training was, however, not fed back to the German side. Instead, the managers at the subsidiary independently expanded their own training time frame and adapted the training documents, thereby rendering improvement at headquarters impossible. This episode indicates a lack of bottom-up communication that will be elaborated in the thematic categories 'responsiveness to feedback' and 'changing through communication' further down. The frequency and length of respondents' comments on the training phase seems to almost entirely reflect the importance of the first encounters with the new system, and much less the friction with headquarters. Although UK managers occasionally expressed serious dissatisfaction with the initial training plan, it did not lead to a similar questioning of other aspects of the change.

Employees at the British subsidiary showed a similar degree of discontent with the early training efforts. They entirely agree with their superiors about the inadequacy of the original training content and the brevity of the entire exercise. For their day-to-day operations they had wanted to be given practical direct instructions on how to use the different screens that are relevant to their specific tasks, a type of hands-on instruction the German trainers were not prepared to provide. An on-the-job training with users experienced in the relevant tasks as trainers would have been much preferred.

> "I personally don't feel we had adequate training on it, I think we were given about 4 hours in total over a period of 2 to 3 days." (Susan Parker)

> "[The initial training in Germany] to me was a total waste of time because they told us such, the information that they gave us wasn't user friendly, it was very complicated, and they gave us all these big manuals, [...] it was implemented without really much training I must say, you know, it was, we had like a room like this and we'd practice, but uh, the training that we were given and the information that we were given was so long winded, it was too detailed, you didn't need to know it, [...], and it was a hit and miss I would say for the first six weeks." (Jane Adams)

In contrast, German managers give a more positive account of the training efforts and by and large evaluate the training as successful. After all, users produced no major mishap once the system went live. Discontent among trainees is not particularly emphasized, although it is acknowledged that more training needed to be provided than was originally planned. One German manager also defends the train-the-trainer principle, according to which key users are taught selectively in order to then act as trainers themselves and pass on their knowledge to colleagues. However, it was also recognized by the German side that the training phase was a difficult period for participants and put them under increased pressure.

> "[The training] wasn't entirely easy I would say, it wasn't easy for me, because it was the first training of this kind for me [...] for those people it was also completely new and they had to carve the practice time out of their normal working time, or they had to stay longer at times, simply to be able to practice." (Sabine Fischer)

The train-the-trainer principle required three British employees to participate along with their managers in the initial training session at headquarters. Alice Farnsworth, Abigail Woolfe, and Jane Adams were supposed to become relative experts in the parts of the system that were relevant to the operations of British employees. Once returned to the subsidiary, they were thought to convey what they had learned to their fellow co-workers and act as experts within the organization. This expert principle was commented on rather negatively by UK employees and managers. The supposed experts themselves admitted to their minimal and often inadequate knowledge as a result of the training, while their colleagues both empathized with the experts' confusion and questioned the feasibility of the training principle. Most often the experts would simply function as a transmitter of questions from the subsidiary to headquarters.

> "We were meant to be the key users, we were the ones meant to have the answers, and I think sometimes they'd get frustrated when we didn't. [...] But if we didn't know, as I said, we knew somebody to ask, and in the beginning it may have been a bit frustrating for them for wanting all these answers and we just didn't have them basically. We were taught the very basics and we had to build on that. They gave you enough to basically get you by and then you just learned as you went along." (Alice Farnsworth)

> "Jane [a key user] went to Germany in the October prior to this to learn it with another girl, and I think we expected Jane to give us a bit of training on this, which she didn't really, because I think she was just as confused as everybody else." (Susan Parker)

In sum, participants vividly memorized the training as both the direct entry point to the new system and a source of dissatisfaction and friction with headquarters. This friction, although leading to a positive outcome for British change recipients, was in retrospect not construed as resistance and did apparently not lead to any further episodes of openly displayed discontent.

In the sequence of thematic categories on learning in the interview data, the category 'random formalization' would follow next (see Appendix G). However, since that category describes a distinctly organizational level topic, it will be discussed further down in section 4.5.3 on learning at the organizational level.

Responsiveness to feedback

In the earlier section on the quality of the new system, employees in the UK reported that they would like to see several aspects of the SAP system improved or adapted to their specific requirements. This would constitute a reason to provide user feedback to management in England and Germany. In contrast, it was shown in the section on selling SAP that the sales approach and a related disinterest by management in bottom-up feedback was likely to decrease the potential for employees' critical assessment. As revealed above, top-down feedback in the form of evaluative reports on the project was apparently absent. The bottom-up transfer of learning through user feedback was coded for under the code 'feedback' and is presented in the following.

UK managers held a potential to forward feedback from their employees to German headquarters, or provide it themselves. Regarding the new system, they emphasize that their hands were largely tied by the inflexibility of the global SAP R/3 solution and the indication from headquarters that there was very little room for adaptation. While the harmonization strategy of implementing a uniform computer system across subsidiaries seemingly precluded local user feedback on the system functionality, UK managers apparently also did not generate any substantial feedback on the implementation process or on general intra-organizational relations. One British manager expresses concern about the lack of provision of or attentiveness to feedback.

> "I think that [the company] should be much more responsive to the people going through the change." (Robert Walsh)

German managers allude to the hierarchical culture when they say that the few requests, questions, or comments they receive usually originate from the management team at the British subsidiary and never from the employees there. However, they also point out the narrow scope for adaptations due to the uniform system solution, and the limitation of their attentiveness due to their generally busy schedules.

> "Of course there are a lot of requests from bottom-up, which you have to I'd say reject, and that is then the inflexibility. Yes? We naturally then try to argue that it is very difficult to judge this from the perspective of an English clerical assistant or whatever without full understanding of such a whole European solution." (Peter Schmitdbauer)

The most revealing answers on the topic of feedback stem from the employees at the British subsidiary. They provide an account of a situation in which there is little encouragement for voicing critical thinking. The employees do not seem to be expected to make suggestions for improvement or take the initiative in any bottom-up learning ef-

fort. In case they do generate feedback, specifically on the system, it is channeled through local management to headquarters, and most often rejected there, as stated above.

> Interviewer: "Suggestions like [modifications of SAP functions], can you make them to anyone?"
> Abigail Woolfe: "We've not been encouraged to."

> "[It would be better if] they would take our comments across as well, how we feel, if we've got comments, our views as well, take our views as well before the change, because we might be able to implement something else, you know, because we work in that position, there might be information there. Looking at it from the top end and seeing how the person is working, obviously you can see, but then taking a view from the person as well would be a help, wouldn't it." (Dheepa Naidoo)

In sum, bottom-up feedback mechanisms throughout the change project appear to have been undeveloped and individual initiative stifled by a rigid technology and a distinct hierarchy. The latter two aspects also play a role in causing an inattentiveness or even disinterest at the management level in bottom-up feedback provision, especially in Germany. It must be suspected that these circumstances had a profoundly diminishing impact on learning in general, since feedback is a factor that links individuals, groups, and the organization in the collective learning process. Moreover, resistance as a feedback mechanism with a strong signal value was neglected, thereby adding to the neglect of this type of knowledge generation and provision.

Learning by doing

The code 'individual learning' naturally pertains mostly to employees at the British subsidiary, since they were the main target group that needed to learn the new system. British managers use SAP as well, but it is by far not such an integral part of their daily routines. The main finding for the employees is their preference for practical learning. Instead of receiving lectures or handbooks, the employees found it much more useful to get a hands-on introduction that was tailored to their specific task structure. As indicated in the findings for the code 'training', practicing with SAP on a mock system and later as a form of on-the-job training was the main way of learning for individuals. Hence, this direct experiential learning reflects the model proposed in the theoretical chapter on organizational learning. New employees that joined the company after the change project also had an experiential learning phase.

> "Any new person that starts, we just sit them with another person who's used it for a long time and they get to talk." (Alice Farnsworth)

> Interviewer: "So how do you learn, how do you build on [the basics you were taught]?"
> Alice Farnsworth: "Uh, if you have a problem, if there is something I can't do, if I ask somebody in the sales office and they don't know, fair enough, we then go to the factory and ask, there is a person at the factory, and nine times out of ten it's Frank, and then he passes the information back."
> Interviewer: "So you wouldn't fiddle around yourself and try?"
> Alice Farnsworth: "You could, but you would end up in an awful lot of trouble, I prefer to ask somebody, I think because SAP is quite powerful [...], and I could do a lot more damage."

All in all, the findings on individual learning so far seem in accordance with the theoretical expectations. Experiential learning at the individual level, as will be shown mostly linked to and supported by group interaction, constitutes the majority of participants' learning efforts. The accounts provided on learning concentrate on the new technology and on the lowest level in the hierarchy. Managers in Britain and Germany seem somewhat peripheral to the learning efforts within the project. Again, resistance neither plays a role for individual learning in the new system, nor functions as a source of learning for the improvement of the system or for project changes.

Results on the thematic code 'group learning' will be presented further below in section 4.5.2 on group level learning.

Honesty, cohesiveness, and lost learning

When people terminate their working relationship with the organization and leave, or when knowledge is not expressed in observable behavior, then learning is lost to the organization. At R&P UK there was one case of a customer service representative leaving voluntarily prior to the change project[30]. Several members of staff in the UK reported that the particular customer service employee left, because she apparently felt unwilling to meet the upcoming challenge of having to adapt to a new technology. As learning builds on prior knowledge, collective learning efforts are impeded if knowledgeable individuals are no longer available. UK managers showed awareness of the detrimental effects of losing experienced staff in a period of change.

> "People could possibly have left [because of the change]. If they left, their expertise went with them. They didn't have any expertise in SAP, but they sure as hell knew what they were doing at the moment, and could talk the customer tune. [...] If you lost them, and had brought an outsider in, who had no loyalty to R&P, who was just there for the salary, we lost that. [...] We

[30] The dismissed warehouse staff is not considered here, because they worked in a separated unit, which was closed down entirely. Although a lot of knowledge lost as a result, it was, however, mostly irrelevant to the subsidiary's further operations.

> train people to be experienced, to know what our customers need. [...] Change your staff every six months and you have no experience." (Hugh Prescott)

> "I think the biggest problem that faces R&P is that as they exercise more control they will stifle individuality and then they will lose the benefit of having the flair and the imagination that comes from grassroots." (Hugh Prescott)

R&P UK was fortunate to have only one employee from its core unit leave as a consequence of the change. Experience-based collective learning therefore seemingly did not suffer dramatically. It is naturally harder to assess the extent of learning lost due to individuals' failure to share their knowledge, that is the non-translation of individual knowledge into behavior observable by others. The results under the code 'group learning', presented in the next section, would indicate that this was minimal, as respondents reported a great sense of cooperation during the learning phase. However, the second quote above hints at the influence of a changing company culture that might function as a discouragement to open interaction with the purpose of collective learning. In addition, it has been shown that there was a certain inattentiveness or lack of interest for bottom-up feedback. These two facts combined suggest that despite employees' willingness to cooperate with one another, the company itself might lose learning through a more control-oriented culture and a discouragement of personal initiative and constructive criticism.

At the end of the individual interviews respondents were asked to tell about the lessons they learned as a result of the change project. This was an open question that did not refer specifically to any topic discussed during the interview, and respondents were prompted to think of recommendations for future change projects.

Honesty and fairness were the two suggestions UK managers highlighted. They stressed the importance of fair treatment in getting the support of the staff to follow along a change initiative. One manager named the warehouse closure as the prime example for a positive outcome of fair treatment, as a result of which the warehouse operations could be maintained until the end of the change period. More proper and early communication was also suggested.

> "When there is change, be honest with people, be as honest as you can be with people. If there is going to be a change that might affect people, let them know as soon as possible, and don't let the rumors start spreading, you know, give them the truth and ask for their support and I think you get it. I think that's one issue. The second issue is good communication as in all things is really the key." (John McGregor)

The German management team also focused on communication as an important success factor. It was recognized that communicative efforts could have been more extensive in the change project. What is meant is more particularly direct personal interaction rather than telephone calls or emails. In addition, the German side also stresses the positive effects on the organization's cohesiveness that such a project entails.

> „Lessons learned are certainly that such projects develop the cohesiveness of the organization [...] very, very strongly, [...]. That you simply get to know each other better. [...] It brings the organization together and thereby the understanding for the problems of the other side." (Heinz Berwanger)

> Especially for England I would have had the IT do more of the training part [...]. There were many misunderstandings, so communication, definitely more direct communication on site." (Peter Schmitdbauer)

The recommendation for more communication is also brought forth by British employees. They mostly relate this to the aspect of honesty, namely informing the entire organization about upcoming changes as early and as comprehensively as possible. Reflecting on earlier results on anxiety and uncertainty, the employees again stress their uncomfortableness with the in their view inadequate information flow during the project. In addition, more training is recommended, as indicated in the earlier result section on the insufficiency of the training program. One employee suggests additional training sessions a few months into the change and afterwards at regular intervals.

> "Be as upfront as you can be and reassure people, that just because that's closing it doesn't mean that this is going to go. I mean that's all we wanted to know basically, and people were too frightened to ask." (Abigail Woolfe)

> Interviewer: "So more communication and training?"
> Susan Parker: "I bet everybody said that, haven't they?"

In sum, the lessons learned by project participants center on recommendations about more and better training, a commitment to openness about the direction of the change, and more frequent and comprehensive communication between organizational units.

The findings for the basic code 'communication' pertain to learning at the group level, and will therefore be presented in the next section.

4.5.2 Group level learning

Similar to the section on existence and intensity of group level awareness, information about learning at the group level needs to be extracted from the interview results and the project documentation. Due to a scarcity of relevant data in the documents, findings on group level learning stem mainly from the interviews, namely from the thematic code 'group learning' and from the thematic category 'changing through communication'.

As indicated by the quotes in the 'learning by doing' section, individual and group learning seem to be closely linked in the project; especially in an environment were many employees work in the same room. This assumption is confirmed in respondents' accounts of group learning. Again, the topic of group learning is mostly relevant to employees, since British managers do not work as a group and do not rely extensively on SAP in their daily routines. The few remarks by German managers in this realm entirely correspond with those by employees at the subsidiary, which are presented below.

UK employees generally highlight the group experience as the key driver of their learning the new system. Facilitated by an open door policy at the subsidiary and by an open-plan office floor for the majority of staff, employees' learning involved to a great extent asking colleagues for help, sharing information with others, and working through problems together.

> "[If people got stuck], they'd say I don't know what to do, does anybody understand how to do this, and if one of us did, because obviously we would pick up different points, some quicker, and you know, in one area and other people would pick up points in a different area, yes, you would just shout, what can I do, and we would all gather around somebody's computer and try to find out." (Christine Peters)

> "I feel that myself and the other girls, we sort of all taught one another, as we progressed with it, we all found out certain things, different things at different times and we'd pass that information on to each other, and I feel for me basically my learning of it came from there more than anything else." (Susan Parker)

The two quotes above reflect the propositions about group learning and memory made in the process model in chapter 1.9. The employee groups learn by communicating through action or verbalization, and a transactive form of memory seems to be present in which different individuals are knowledgeable about different aspects of the new system. Respondents also noticed that the speed and easy with which individuals learn the new technology appears to be to some extent a function of age, with older employ-

ees being a bit slower and more nervous. But such problems seem to have been absorbed by an atmosphere of sharing, interaction, and dialogue, where everyone would make new knowledge available for their colleagues. In cases where employees could not find a solution to a problem locally, the particular issue would be passed on along the hierarchical structure to the managers at the subsidiary and then to headquarters. This trail of expertise back to the central IT department functioned well according to British employees, who found the experts in Germany to be generally responsive to their inquiries.

Changing through communication

The two codes on communication were not included as topics in the original interview topic guide, but were later added in the analysis because of the frequency of respondents' comments in this realm. Communication within the UK and communication between the subsidiary and headquarters were coded for separately.

The results for communication within the subsidiary revealed some overlap with earlier findings on anxiety, uncertainty, and lessons learned. This code pertains exclusively to the British participants, as German managers did not comment on the communication amongst their foreign colleagues. It has already been shown that communicative efforts in term of group learning were judged positively by respondents. However, the communication about the change itself was often deemed suboptimal. Although UK managers generally judge their information policy to have been adequate, indicating for example the frequent staff meetings prior to the change, the fact that employees expressed great uncertainty throughout the project causes doubts about whether the internal communication was sufficient.

> "We knew it at the end of May, beginning of June, we didn't tell the warehouse until July. We took a month to process the management structure to make sure they were right, [...] we were all on board with this, [...] except the warehouse manager, he was kept in darkness, we felt that his allegiance to his staff was too strong. This had to be kept quiet until the right time. Uh, we were guilty of doing exactly what Germany had done to us, but we were on a damage limitation." (Hugh Prescott)

Hence, it seems as if the same kind of scarcity of information from headquarters that UK managers complained about was passed on to the British employees. The British managers unanimously stress their eagerness to be open with their staff, but apparently felt particularly at the beginning of the change project that the news should not be disclosed too early.

UK employees largely reiterate earlier findings in their comments on communication within the subsidiary. They report about the information meetings at the beginning of the project, and about the well functioning communicative interaction at the group level. In addition, they also reflect on the uncertainty aspect once the full ramifications of the change project were announced.

The last code 'communication with headquarters' deals with the communication between the organizational units in Britain and Germany. The word count for this code is comparatively large (see *Figure 4.1*), because respondents provide many elaborate descriptions of meetings and conversations. Again, the results on this code show some overlap with results presented earlier, so the findings shown here will be rather brief.

UK managers evaluate the general quality of the communication stream between headquarters and subsidiary as rather mediocre. They recognize traditional weaknesses in this area, and again criticize the lack of participation in the decision making to go ahead with the change project. Regarding the latter point, British managers are dissatisfied and disappointed that they seemingly were not consulted or more directly involved in conceptual discussions about the project, and hence felt that important information was withheld from them. Such presumptions need not necessarily be fact based, but they reflect the perceptions of participants. At the same time, the trans-organizational communication on aspects of the functionality of SAP was thought to be rather good most of the time.

> "We traditionally haven't been very good as a company in passing on information." (Robert Walsh)

It should be stressed that the recognition of a quality or frequency deficit in communication between organizational units is backed by a common perception that good communication is crucial in large-scale change efforts.

This view is shared by the British employees, who felt similarly uninformed at times, as shown before. The employees cannot comment on the top-level communication on the project itself, but they do elaborate on task related exchanges concerning their daily routines. Such exchanges of queries about the functions of SAP are apparently responded to quickly and comprehensively, which reflects on the integrative function of the new technology. SAP as a company-wide system links different units closely together and greatly enhances communication via email.

In their accounts of communication across units German managers mostly reiterate their lessons learned. They provide some descriptive episodes and conclude that communication should probably move up higher on the agenda for future projects.

In sum, it seems that all participants recognized the pivotal role of communication for the project, but at the same time recollected distinct deficits therein. The learning model proposed in the theory chapters employs communication within the feed forward and feedback processes as the underlying transmission mechanism. In a similar way communication seems to be the underlying brace holding together and enabling the change process. The change did function through communication, but as shown there was apparently too much peremptory top-down communication and too little innovative and constructive bottom-up communication.

4.5.3 Organizational level learning

Despite the indication in *Table 3.2* (p. 138), in this section on organizational level learning, evidence from the documentation is enriched by relevant interview data. As a result, the information about learning at the organizational level consists of the thematic interview category 'random formalization' and the thematic document category 'selling SAP'. This latter category label was also used for interview content relating to learning from resistance at the individual level. The same theme appears again briefly in the documentation and provides evidence for a lack of learning from resistance at the organizational level.

Random formalization

Formalization had been identified in the first theory chapter as learning at the organizational level, as mainly the consolidation of learning efforts undertaken among individuals and groups. The change project at R&P UK required learning in the interaction with the new computer system, and because of the generally altered circumstances at the subsidiary. One aspect of formalization is the writing up of training contents, an important aspect of new knowledge, as it comprises most of the instructions on how to use the new system. Asked about their formalization or consolidation efforts, British managers mainly referred to the production of a training manual that was specific to UK operations. They do not explicitly specify any other kind of systematic written consolidation of knowledge built up during the project. Albeit, moderate regret is voiced over

the fact that there is apparently no organized scheme in any knowledge consolidation effort.

> "Looking back, the biggest criticism of our general performance was the fact that we couldn't really put together, at the stage we were doing the initial training manuals that we were happy with for the UK users, put together really comprehensive sets of instructions because there were lots of things we were learning during the process ourselves." (Robert Walsh)

Most formalization related to the change within the subsidiary seems to be undertaken at an ad hoc basis, without an officially allocated production time or storage location. British employees describe this more directly in comparison to their superiors. According to them, the retention of knowledge about the system was spread across different media, but always in a rather improvised and unsystematic manner. Employees would send emails to one another about new findings, write insights on a notice board in the back of the customer service room, save text files on the local intranet, keep personal notes in desk drawers, or refer to the local SAP manual, which was evaluated by most employees as unsatisfactory. The content of such formalization would mostly be about procedures in the SAP system. However, this content was dispersed among many employees and locations, which would make retrieval of a specific piece of information very difficult.

> Interviewer: "Has there been somebody creating an official binder of 'SAP uncovered', or 'tips and tricks'?
> Christine Peters: "No, I don't think so, no. [...] Somebody came over from Germany again and tried to sort any problems, she produced a huge bunch of notes that Rebecca put into a folder. [...] Nobody actually produced something to begin with, and said this is the manual, here you are, certainly not from Germany. We sort of did this on our own I think, more sort of loose sleeve system than a formalized thing."

> "[If] somebody has a problem, we'd all reach for our notes and see if anybody had actually made any notes on their folder." (Rose Browning)

> "Nobody's been nominated for [the formalization of knowledge]. It would have been a good idea at the time, [...]. I mean, I haven't, I keep notes for myself. Sometimes when I have to do something I can't remember how to do it, but I have kept it in an email and I can find it that way and I'll go into that if I can't remember how to do it. But no, nobody's amalgamated all this information." (Jane Adams)

While German managers cannot comment on the formalization efforts of their British colleagues, they provide a somewhat similar impression as illustrated above when asked about their documentation of the project. The written material for the transition at R&P UK was largely adapted from documents on the earlier change projects in

other national subsidiaries. This includes mostly training materials, planning documentation, and technical specifications. Interestingly the German management did not produce any final analysis or retrospective evaluation of the project, something that was missing in British managers' recollections as well.

> Heinz Berwanger: "Normally we don't produce [a final report], that is not customary here, we do a continuous improvement process throughout the project, we have open points, which are tackled, but a proper final report, we don't do that."
> Interviewer: "Why?"
> Heinz Berwanger: "If things work out you don't have to do it."

The reason given in the quote above for not writing a final project report reflects on earlier theorizing about resistance to change. Had there been more resistance in the project, or had the existing resistance not been denounced as dysfunctional, it must be suspected that this particular manager would have found a retrospective analysis more worthwhile. Hence, while important learning from experience is precluded by a lack of interest for this relatively smooth transition, resistance and a functional understanding thereof might have prompted managers to consider learning from experience more seriously. In that respect, resistance might not only have the potential to function as a source, but also as a stimulus for learning.

Overall, the formalization efforts related to the focal change project seem to be random and unsystematic. There is no centralized database or established directory where new knowledge is retained. The consolidation relies on individual initiative, is hardly cumulative for the entire organization, and thereby impedes easy retrieval. As for a retrospective analysis and evaluation of the project, a potentially strong means of experiential learning, this was apparently neglected completely by both the British and the German management. This conclusion is confirmed by the earlier examination of the production frequency of project documentation (see section 4.1.2, p. 172), in which it was found that the formalization effort practically ended shortly after the system implementation.

Selling SAP

'Learning from resistance', is the sole code retained in the document analysis from the interview learning cluster, and the sole indicator of learning in the project documentation. It combines only three quotations; all coming from the single employee newsletter that mentions the change project. The author, Kevin Franks, informs his employees about the upcoming change.

> "As you may be aware we in the UK will be integrated into this exciting new system from the 1st of February next year. With the introduction of this system we can look forward to many immediate improvements to our current systems, along with ongoing improvements as future developments are made to the new system." (Kevin Franks in an employee newsletter)

The wording of this text passage and two others in the document corresponds exactly to Kevin Franks' interview remarks about selling the new system to the employees at the subsidiary. SAP is described as exciting and an immediate improvement, while the detrimental effects of the system on the warehouse operations or any acceptance issues are omitted.

There are no other comments on learning or indicators of learning from resistance in the document content. All other assumptions about learning concerning the project documentation are based on production frequency and observations about content characteristics, and were mainly presented in section 4.1.2.

4.6 Summary

Concentrating on the research focus, the findings indicate moderate resistance by a single individual, low awareness construed as dysfunctional and exclusive to German managers at the individual and group level, and no observable use of resistance as a source of learning at any level of analysis. In the following, these presented results on the variables resistance, awareness, and learning as well as on the influence of contextual factors are integrated to conclude on the question of learning by resistance in the change project at Rousseau & Paul UK.

The transformation at R&P UK resulted in decreased independence for a formerly rather autonomous subsidiary. Integrated in a uniform, company-wide IT architecture and a joint distribution system, the British operations became significantly more transparent within the centralized structure of the whole organization. This centralized structure is reflected in the decision-making process about the change that took place in a non-participative style exclusively at headquarters. The fait accompli criticized by British respondents emerges in the first document presented by German managers, which already contains a project management organigram and a detailed time plan. Resulting from a lack of participation in a decision that entailed many redundancies and sincere changes, UK participants reported increasing suspicion and anxiety. However, such

negative emotions and anticipations were apparently not strong enough to trigger widespread resistance.

The minimal resistance that did surface was confined to a single individual, the IT manager at the British subsidiary, and was expressed by him through reluctant cooperation and open criticism of the change measures. No other change recipients followed this course of action. There are two immediate, contextual reasons for the detected limited degree of resistance.

First, the new system was presented as an overwhelming technical fix. Any critical assessment of the new system is essentially ruled out by its monolithic structure, inflexibility to local changes, and the centralized system architecture. R&P UK was the fourth in a succession of SAP implementations in national subsidiaries and was required to adapt to preconfigured standards. The project was therefore subject to a success imperative that rejected local criticism and amendment. Second, SAP seems to be a genuine improvement over the previous technically inadequate system. It enables the distribution from a centralized warehouse facility in Germany and has a modern user interface that allows for quicker processing and transactions. Resisting SAP as a whole would not have made sense from a usability perspective.

One more reason for the low level of resistance is central to the research focus of the present study, and relates to the role of awareness. More specifically, it reflects on the interaction between awareness of resistance and resistance itself. Only German managers, at the individual and group level, showed explicit awareness about resistance. This awareness was communicated as not necessitating significant consequences for action, and the resistance observed by them was perceived as dysfunctional. The semantic elaboration of resistance in the project by German managers is partially reflected in the general repertory grid results. While a majority of the elicited elements and constructs show a rather dysfunctional and destructive image of resistance, the multivariate solutions illustrate that all groups recognize the potential for resistance to be constructive and functional. However, the concept was never directly associated with improvement or learning. An apparent disinclination to recognize functional qualities of resistance was demonstrated, for example, by two British managers' unwillingness to evaluate resistance in the repertory grid exercise, because they felt upset by a suspected association of their subsidiary with this controversial concept. The little resistance that did surface at the individual level in the project was pathologized by dismissing it as a personality issue. As a result, over the time span of the project, the reciprocal effects of the

described type of awareness seemingly contributed to the confinement of resistance to the reluctance of a single individual.

In sum, within the context of a hierarchical structure that impedes bottom-up input and an identified success imperative, the potential for resistance was largely smothered. Project success for the realm of the human factor, that is the change recipients, was subliminally defined as acquiescent acceptance, which is reflected in the idea purported by UK managers of selling SAP to their employees. Resistance in this context acquired an 'all or nothing' connotation for the change recipients, thereby excluding moderate forms of informed criticism and user feedback. The reciprocal effects of low awareness and negative construal further precluded any consequential emergence of resistance or constructive attentiveness to criticism.

The possibility of resistance functioning as a source of organizational learning was minimized by the described low degree of resistance, the confined awareness, and the negative construal. In fact, no learning from resistance at the individual and group level was reported, and there is no relevant evidence in the project documentation. It seems that awareness, as the necessary mediator, was not sufficiently prevalent and intense to trigger learning. Resistance and awareness of resistance were neither recognized nor utilized as sources of learning.

There was, however, learning from other sources, such as the training on and interaction with the new system. The involved learning processes were assessed, and consonance with several aspects of the proposed integrated framework of organizational learning was found. Getting practical experience on the new system was the preferred type of learning at the individual level, while learning through interaction and dialogue at the group level was also extensively reported. Factual or perceived experts served as key elements of a transactive memory system. British managers verified the assumption that individual learning may be lost because of decreased motivation or employees leaving the company. Task execution and experience gathering seems to have temporally preceded formalization in general. However, there were also several impediments to learning in the project.

First, there was generally little interest by change agents in bottom-up feedback from change recipients. As implied above, informed user comment was not encouraged. While there were certainly constraints set by a uniform company-wide IT solution, the functionality of the system leaves room for improvement. This was not explored despite

a potential usefulness for subsequent implementations in other national subsidiaries. System uniformity took priority over system usability. Disinterest by management in employee opinion hindered the flow of learning across levels of analysis, and might likely decrease employees' motivation for bottom-up feedback provision in the future. This is especially problematic given that the importance of good communication between the different units of the organization was emphasized unanimously by respondents. Second, the formalization resulting from individual and group learning on the new system followed a mostly random fashion. There was no systematic gathering of generated knowledge. Instead, employees collected their own notes ad hoc and circulated them around the work floor. The formalization represented by the official project documentation was dominated by technical information. Such documentation makes decisions and responsibilities traceable, but disregards many learning purposes. Produced exclusively by staff at German headquarters and handed down to the subsidiary, a change recipient perspective was absent. Third, and closely related to the characteristics of the general formalization is the lack of retrospective project evaluation, which also diminished potential learning. The documentation contains no evaluative report, again despite the fact that at least two similar projects were to follow at other national subsidiaries.

In conclusion, the factors that stifled resistance and awareness not only precluded resistance as a source of learning, but also largely shaped any other learning during the change. Learning was not a priority in the project, vividly demonstrated by the disinterest in bottom-up feedback. An opportunity for more organization-wide learning was lost, and it must be suspected that not heeding resistance might have detrimental effects in the long run. Such assumptions will be part of the following discussion chapter.

5 DISCUSSION

The objective of this thesis was to assess the potential of resistance to change as a source of organizational learning. In the theoretical sections, resistance was depicted as an independent variable with effects on organizational processes. A shift of attention from the causes to the effects of resistance illuminated the diagnostic and informative qualities of the concept, which were examined for their capability to initiate learning in an empirical case study of an organizational change project. More specifically, the dependent variables of interest were organizational awareness about resistance, as suggested by an analogy to acute pain, and resulting organizational learning. For both variables, an influence of contextual factors was recognized and three levels of analysis were distinguished. Learning processes were identified as cognition on the individual level, communication on the group level, and formalization on the organizational level, and were integrated into a framework of learning and memory. The results of the study revealed several contextual and procedural factors that limited the emergence of resistance and awareness, and subsequently hindered learning in general and precluded learning from resistance in particular.

In the following last chapter, a reflection on both the reviewed and proposed theory as well as on the analyzed results will be provided. First of all, the research focus is discussed, including contextual influences, focal variables, and the employed analogy to acute pain. As the findings indicate a lost opportunity for learning and limited awareness of resistance, some opportunity costs of not heeding resistance are considered. Following an evaluation of the proposed process model of organizational learning, the chapter then concludes with reflections on the research process, on the limitations of the findings, and on implications for further research.

5.1 ORGANIZATIONAL LEARNING FROM RESISTANCE

In the first part of the discussion chapter, I will return to both the research question and the research focus, and evaluate the main conceptual issues from the onset of the study in the light of the obtained empirical results.

5.1.1 Revisiting the results

"How can an organization learn from resistance to change?" This research question was asked on the basis of theoretical discussions about the processes of collective learning and the potential for resistance to act as a functional source thereof. The short, practical answer arising from the results of the conducted empirical study is twofold, and distressingly banal: An organization can learn from resistance to change, if it allows resistance in its midst, and is interested in learning.

Little resistance was found in the change project at R&P UK. The new computer system was sold as an overwhelming technical fix, and its smooth implementation was an imperative set by headquarters. While in principle recognizing potential benefits of resistance to change initiatives and change contents, respondents neither considered resistance an option nor associated it with possible improvement or learning in the circumstances of the project. On the contrary, the little resistance that did surface was dismissed as a personality issue. This type of 'negative' awareness is suspected to have had reciprocal effects on the existing resistance, reducing its intensity and the likelihood of further emergences, which in turn would then reduce awareness. As a result of such dynamics, the low level of awareness did not suffice to trigger learning. In addition, the intra-organizational communication that was examined did not easily facilitate learning initiated by end users of the new system. Upward communication was generally hampered by the distinct organizational hierarchy. A low priority of linking learning and improvement was reflected in the disregard by management of bottom-up user feedback. An observed unsystematic formalization and a lack of retrospective project evaluation support the impression that learning was not a main concern in the change at R&P UK. In sum, the combined results converge on a discouragement of resistance and a disinterest in learning.

In a conversation with Heinz Berwanger after the presentation of results to the German management, he agreed with these conclusions. As the leader of the German management team, he commented that the implementation projects in national subsidiaries so far were too preoccupied with technical and operational aspects of the changes. Consequently, the 'human side of the change', as he called it, would often be left largely unattended.

Given the presented results, allowing or encouraging resistance in the context of an organizational change would apparently first of all require a functional understanding. Although respondents acknowledged a potentially informative signal value of resistance in principle, they did not apply this theoretical awareness to the practical circumstances of the change project. A perceived inherent negativity, in combination with contextual influences, led to a situation in which resistance was generally not considered as a viable option. The negative representations of resistance among project participants concur with Bauer's (1993) results in his semantic differential study of the concept, in which he found a prevalence of similarly negative connotations and a strong association with deficit concepts. Hence, the dysfunctionality of resistance in the eye of the internal observer seems to not be particular to the examined circumstances, but appears to be a common phenomenon in organizational settings. Resistance is an emotive term and is likely to be intuitively bad news in many organizational circumstances.

In order to increase the learning potential of resistance, one conclusion from these findings would be to promote a functional understanding. Relating to the semantic elaboration aspect of the awareness variable, such a functional understanding would likely not have a dampening reciprocal effect on resistance, because it conveys an interest in extracting information from the behavior of the resistant individual. Therefore, a functional understanding would lead to stronger awareness, or would at least not decrease awareness. It then becomes a practical task of change management to educate change participants about the diagnostic and informative aspects of resistance. Another method of facilitating a less aversive reaction to resistance might also be to simply change the label. When presented with the findings of the research study, the British management, for example, advised me to not use the term resistance in future field research, because of the term's negative and emotive connotations. While a different terminology might yield some benefits regarding access and cooperation in applied research, the usefulness of a new label for the changing organization is not so clear. A label less salient than resistance might not raise a sufficient degree of awareness to function as a learning input, for example.

Following the rationale outlined above, more awareness and in turn more learning would be facilitated if resistance were assessed by change participants for its diagnostic and informative content. This assumption, however, begs two questions. First, can only a functional understanding of resistance raise awareness? As explained above, understanding resistance functionally would increase the intensity of awareness because of

the information seeking due to the interest in the diagnostic qualities of resistance. However, a dysfunctional understanding might also increase awareness simply because of the bad news value of resistance. Hence, in one scenario, awareness is raised as a function of interest, while in the other scenario awareness is raised as a function of alarm. The second, related question is whether only awareness in the form of a functional understanding can lead to learning? Awareness has been established as a necessary precondition for learning, and the empirical results in the present study showed that a dysfunctional construal of resistance, in combination with other factors, precluded learning. It must be suspected, however, that a dysfunctional understanding can also serve as a learning input, although leading to a different type of learning. If resistance is seen as a nuisance that needs to be overcome, the organization might learn to avoid it in the future. This question of types of learning will be discussed in more detail further below in section 5.1.3.

Apart from allowing resistance, a basic interest in learning seems to be the second general requirement for organizational learning from resistance to occur. In this study it was shown that strong contextual influences diminished especially upper management's interest in learning. The two key diminishing factors seemed to be the nature of the project itself and the centralization of the organization in combination with a somewhat more pronounced hierarchy.

Identified as a monolithic technical fix, the computer system that was implemented at R&P UK offered no degrees of freedom to be adapted the to the needs of the local organization. Moreover, despite the novelty and centralized architecture of the system, SAP did not require a deep alteration of employees' work routines. Employees at the subsidiary had worked on computers before the change already, and they recognized the immediate benefits of the new technology to their everyday tasks. Hence, the nature of the change appears to at least partially determine whether learning is at the periphery or at the core of an organization's attention. It must be expected that more fundamental changes, for which standardized solutions are neither available nor applicable, or for which the focal organization has no prior experience, generate a greater necessity to pay attention to learning. Such changes may not only create urgency for learning, but might also cause greater resistance in the first place. In this respect it would have been interesting to look at the first SAP implementation at R&P in Germany and compare that initial change with the subsequent change at the British subsidiary. One might also

speculate about the external influence of the somewhat static environment of the ceramics industry in which R&P operates. Learning is likely to move to the top of the agenda for organizations that are subject to constantly changing environments (Eisenhardt, 1989b; von Rosenstiel & Koch, 2001).

A second factor that diminished learning in the observed project seems to be the constraining influence of organizational hierarchy. The change caused R&P UK, a formerly rather independent subsidiary, to become integrated in a centralized organizational structure. The geographical distance, the different languages, and several layers of hierarchy seem to be impediments to a flow of learning. User feedback needs to travel further in the centralized organization to reach people with the authority to make significant decisions. In addition, bottom-up feedback seems to have been generally uncommon, and was not encouraged by management.

Along with the centralization, the new system also brought about greater transparency. Essentially, this meant greater top-down control, as the administrative rights to the system's monitoring functions all lay at headquarters. As a result, greater transparency changed the power relations by increasing the means of control of the German management. Similar effects of new technology on intra-organizational power relations, albeit not necessarily with the same implications, have been illustrated by other authors; for example for the case of CT scanners in hospital radiology departments (Barley, 1986), or for the case of a computerized information system in a government agency (Burkhardt & Brass, 1990). It could also be assumed that the lack of interest in bottom-up feedback might have been caused by a confidence in the monitoring capabilities of the new system. Finally, the centralization and thereby the integration of the subsidiary into the greater organization require an increase of attention to internal communication, simply because communication will now often need to travel further or to more recipients. As this might not have been realized yet at R&P, the found disinterest in learning could also be a result of a temporal inability to learn within the new organizational structure. Hence, bottom-up feedback would require new patterns of communication following the change. In addition, internal feedback and learning need not only be integrated into a more centralized structure, but potential providers also need to feel motivated to contribute. Especially large organizations often institutionalize feedback and learning by setting up research and development units, thereby potentially signaling to the rest of the employees that there is no specific need for their input. At R&P, for example, the generation as well as the execution of amendments and improvements to the

new system were centralized at the German corporate IT department. On the other hand, large organizations also have the resources to devote significant attention to local learning during and after a change, for example through project evaluations. This was not done for the examined project at R&P UK.

In sum, the limitation of resistance and the disinterest in learning constitute a lost opportunity for learning in the project. While the disinterest in learning relates to the contextual influences, the limited resistance pertains to the dynamics between resistance and awareness. In the following section, some procedural implications for the sequence of resistance, awareness, and learning are discussed.

5.1.2 Focal variables and levels of analysis

In *Figure 2.2* on page 110, the research focus was illustrated as a sequence of resistance, awareness, and learning. In the empirical study, especially the variables awareness and learning, in combination with contextual factors, were of concern in order to assess how an organization can learn from resistance to change. Combining the variables of the research focus, *Table 2.2* on page 111 described potential outcomes of the tripartite sequence. The results of the present study showed some resistance, some awareness, and no learning from these sources in the change project. It becomes clear that *Table 2.2* cannot capture the revealed nuances, as the findings would have to fit somewhere in between the cells. The outcomes in the table were logically derived, and the present real case indicates that this structuring of potential outcomes requires some refinement. Such refinement needs to account for change participants at various levels of aggregation.

Following the conceptualization of organizational learning in the first chapter, three levels of analysis were introduced to distinguish between different entities involved. This categorization was then applied to the variables resistance and awareness as well. Including levels of analysis in the presentation of results, it was shown that there was resistance at the individual level, awareness at the individual and group level, and learning at no level. Going back to *Table 2.2*, these findings would fit in between the two lower cells on the left hand side, since there was awareness, but not at all levels. Consequently, a refinement of *Table 2.2* needs to integrate levels of analysis. *Table 5.1*

below shows the combinations of potential outcomes for the focal variables and the three levels of analysis.

Table 5.1: Combinations of focal variables and levels of analysis

	Resistance	Awareness	Learning
Organization	Yes/No	Yes/No	Yes/No
Group	Yes/No	Yes/No	Yes/No
Individual	Yes/No	Yes/No	Yes/No

The results for the present study are underlined.

In principle there are 64 potential outcomes. Some of those are theoretically impossible. For example, it was established that learning from resistance requires prior awareness, which rules out all combinations with any 'Yes' in the learning column and no awareness at any level at the same time. Other combinations are theoretically possible, but would need empirical verification to reveal their feasibility. For example, the pain analogy suggests that awareness without prior resistance is possible, but it remains to be determined to which organizational reality this scenario would relate. The example by Prasad & Prasad (2000) illustrated in section 2.1.4 provides some indication of occurrences of this type of 'phantom resistance' or 'phantom awareness'. Generally, one would expect a left-to-right sequence for the variables, and a bottom-up sequence for levels. Hence, learning from resistance requires prior resistance and awareness, and activity at the organizational level is enabled by prior activity at lower levels. By this rationale, it seems unlikely, for example, that awareness restricted to the individual level could result in full-spectrum learning. In this respect, the question would be what kind of awareness is required to trigger learning?

This question points to a closer look at the results. There was awareness about resistance at the individual and group level in the change project, but this awareness was confined to a subgroup of change participants, namely the German management. The majority of individuals and groups at the British subsidiary did not exhibit any awareness of resistance. This indicates a further layer of complexity. At the individual and group level there might be partial or full resistance, awareness, or learning, respectively. At the organizational level, the scaling of extent would only apply to the learning variable, as formalization might be only partially disseminated. Resistance and awareness at

the organizational level, both not procedurally defined, would necessarily pertain to the entire organization. As a result of this added complexity, which derives from the empirical findings, future studies on the research focus need to consider the three focal variables, the three levels of analysis, and the degree of participation within each level of analysis. *Table 5.1* would therefore have to be expanded in the first column on the left to account for the degree of resistance, awareness, and learning within each level. This is not done graphically here, however, because the issue of between- and within-level participation raises a further conceptual point.

Throughout the discussion so far conclusions have been made about the intensity of different concepts and processes. It was assumed that the change at R&P UK was not dramatic enough to cause widespread resistance, that the observed resistance was not strong enough to lead to pervasive awareness, that the analyzed awareness was not intense enough to trigger learning. Moreover, in the paragraphs above it was elaborated that the found occurrences were restricted to certain levels of analysis, and to a certain degree of participation within those levels. In this light, organizational learning by resistance seems to be a question of transfer and of crossing thresholds: Thresholds between variables, thresholds between levels of analysis, and thresholds within levels of analysis.

For organizational learning, the threshold question has been adequately defined, at least between levels of analysis. According to the formula described in section 1.6, genuine organizational learning is constituted by learning at the individual level and learning at the supra-individual level (OL = ILL (GLL+OLL)). Moreover, the processes involved in organizational learning have also been outlined. For resistance and awareness the threshold question is not so clear, as these two variables have not been theoretically dissected against the background of different organizational constituents. An analysis of the procedures involved in resistance and awareness at different levels, similar to that for organizational learning in section 1.7, could provide some clarification on the dynamics between levels for those variables.

However, at the core of the threshold discussion seems to be the participation within levels of analysis, as this is the smallest distinguished unit and the building block for further explanations. Generally, thresholds for within-level participation appear hard to define, and would need to be tackled individually in further research. For example, what degree of participation is necessary for partial awareness at the group level, that is, how many groups need to be aware of resistance, in order to cause awareness at the or-

ganizational level? The empirical results showed a partial awareness at the group level, as only German managers reported that they had observed and discussed resistance. Their awareness did apparently not disseminate to other groups or to all project participants, indicating a participation below the necessary threshold.

In an ideal or maximized scenario, an emergence of resistance would lead to full awareness at all three levels of analysis, and this full organization-wide awareness would lead to genuine organizational learning involving all individuals, groups, and the organization as a whole. Obstacles to such a scenario are contextual influences, as found in the results, and the extent and degree of intensity of the procedural transfer, as presumed in the threshold discussion. On the procedural side, the maximized scenario could in principle be attained by either lowering thresholds or increasing the transfer intensity. A functional understanding of resistance, for example, could be expected to lower the threshold between resistance and awareness. Increasing the transfer intensity between variables could mean to involve all three levels of analysis within each variable. However, these assumptions are somewhat speculative, given the limited empirical evidence. Further research needs to determine what processes are involved in resistance and awareness at different levels of analysis, and how the procedural transfer is facilitated. Internal communication might be expected to play a key role here.

5.1.3 Extending the pain analogy

Two observations that have so far been mentioned in the discussion lead to a reassessment of the pain analogy in the light of the obtained results. In section 5.1.1 it was considered whether resistance requires a functional understanding to result in learning. The question ensuing from this consideration was whether different perceptions of resistance lead to different types of learning. In section 5.1.2 assumptions were elaborated about the empirical observation that the little awareness of resistance in the change project at R&P UK was not enough to trigger learning. Even though there was resistance, awareness was confined to a subgroup of project participants. The pain analogy would lead to the assumption that the project did not feel the pain.

The classical learning literature suggests that learning by acute pain is essentially a form of avoidance learning (Anderson, 1995). If pain is a consequence of action, it may be escaped by a particular behavior. However, unlike escape learning, avoidance

learning is not dependent on reward; it is sustained without further consequences, neither positive nor negative. Avoidance learning leads to the development of a conditioned avoidance reflex, which signals pain inducing situations that need to be avoided in the future. As a reflex that is sustained without reinforcement, avoidance learning does not involve deeper processing or a more fundamental assessment of the situation. If extrapolated to the organizational level, an equivalent of the individual level concept of avoidance learning would be single-loop learning, as introduced in section 1.3.2 on types of learning. Single-loop learning is restricted to detecting and correcting errors within a given system of rules. The main issue is performance enhancement within a given target. This stands in contrast to double-loop learning, which is defined by the reassessment of underlying assumptions, values, and targets of an activity in the light of a new situation. Here, the idea is not so much an efficiency gain, but rather a paradigm shift (Argyris & Schön, 1978).

Following the argumentation above, the pain analogy would suggest that organizational learning by resistance basically leads to avoidance learning. In this perspective, resistance is an unpleasant, painful consequence of organizational action, that is change, and hence the essence of learning will be to avoid change in the future. The insight from this kind of learning is minimal. Behavior is suppressed and imagination and thinking are not involved. On the basis of the obtained results and the thought process so far, two arguments are made against these implications of the pain analogy. The arguments are somewhat intertwined and question the applicability of the analogy in the form that was outlined in the second chapter.

Firstly, it is proposed that organizational learning by resistance may resemble double-loop learning if resistance to change is understood functionally. A functional understanding of resistance is constituted by a recognition of the diagnostic and informative qualities of resistance to change. A pragmatic interest in the signal value of resistance necessarily entails an assessment of the change in the light of resistant behavior. This will involve an assessment of antecedents and consequences, objects and motivations for resistance, and the content of the change itself. As a result, deeper cognitive processing must be involved than what would be suggested by the avoidance learning paradigm. If directed at underlying assumptions and theories-in-use, such deep processing holds the potential for double-loop learning. In short, a functional understanding demands intelligent evaluation, while a dysfunctional understanding encourages overcoming the nuisance of resistance and avoiding it in the future.

A second argument against the supposition that organizational learning by resistance always results in avoidance learning is facilitated by a closer look at the processes involved in organizational learning. These have been identified as cognition at the individual level, communication at the group level, and formalization at the organizational level. At higher levels of aggregation, especially at the group level, learning implies interaction, dialogue, sharing, and mutual assessment. Since organizational learning has been described as involving feed-forward across levels, by the time a learning issue has reached the organizational level, it will likely have been processed by multiple individuals. For these reasons, Jost & Bauer (2003) expect a shift towards higher proportions of double-loop learning at the group and organizational levels. The single-loop learning pattern inherent in avoidance learning appears too limited in an organizational context. Consequently, if learning stalls at the individual level and does not reach the group or the organization, the probability of remaining in the avoidance paradigm would be expected to be greater. Referring to probability or likelihood indicates that the outlined assumption is not postulated as an invariable mechanism. In principle, avoidance learning might even become formalized and engrained in organizational memory. However, the nature of the described group and organizational level processes denotes much potential for double-loop learning at higher levels of aggregation.

Overall, the type of organizational learning from resistance seems to depend on the kind of understanding of resistance and on the extent of learning at higher levels of aggregation. The analogy to acute pain suggests that any organizational learning by resistance results in single-loop learning. In contrast, learning at higher levels and a functional understanding of resistance are presumed to facilitate double-loop learning. In conclusion, the pain analogy needs to be extended in this respect.

5.1.4 Opportunity costs of not heeding resistance

At the end of section 5.1.1 it was concluded that the found limitation of resistance and the disinterest in learning amount to a lost opportunity for learning in the change project. Such lost opportunities might have detrimental effects in the long run. In the following paragraphs some speculations will be discussed about the opportunity costs of not heeding resistance.

The Oxford Reference Online dictionary (1997) defines opportunity cost as "the income or benefit foregone as the result of carrying out a particular decision, when resources are limited or when mutually exclusive projects are involved". The conscious or unconscious decision to inconsiderately overcome resistance instead of paying attention to its informative potential can be expected to result in some 'income or benefits forgone'. While a short term crisis situation might only be resolved by suppressing resistance and ignoring employee criticism, such a strategy is expected to have negative effects in the long run. In the present case, resistance was not heeded because of several contextual influences and the diminishing dynamics between resistance and awareness. In particular, the results emphasized the discouragement of and inattentiveness to bottom-up feedback, the promoted uncritical acceptance of technological change, the subliminal dissociation of resistance from learning and improvement, and the analyzed dysfunctional understanding.

One broad topic area relating to the discussion of opportunity costs is organizational culture, specifically the focus on implicit, unquestioned assumptions and values that people have regarding the way that things should be (Schein, 1990). The culture of an organization is continually shaped by events and actions taken, and change is one of the most decisive influences (Heracleous, 2001). The way change is handled and managed in an organization will significantly shape the organizational culture, which is in turn an important determinant of employee behavior. If resistance to change is smothered, this affects organizational culture as it conveys a message to employees that the organization is either not interested in their opinion or not allowing criticism. The likely reaction by affected employees is then to either stop caring to resist and learn, or to stop daring to resist and learn.

Caring to resist and learn pertains to a general responsiveness to and interest in changes to the organization. In this respect, not heeding resistance might lead to a culture of indifference, in which employees work to rule, but show little initiative to care for anything they are not immediately required to do. Indifference precludes any motivation for inquiry or improvement of operations and circumstances.

Daring to resist and learn pertains to openness, trust, and safety to experiment and criticize. In this context, not heeding resistance might lead to a culture of suppression and fear, which in turn could lead to resignation and indifference. Such a culture will deter individuals from engaging in explorative behavior, and is equally likely to lead to a perpetuation of the status quo rather than to a development of improvement and pro-

gress. As indicated, suppression might precede indifference, and seems to capture the essence of the overcoming paradigm. In the following, the discussion will therefore concentrate more on aspects of not daring to resist and learn.

A culture of feedback and learning, as propagated most evidently in the literature on the learning organization (Senge, 1990a), is unlikely to be developed or sustained if resistance is continually overcome by management. Feedback and learning require a supportive environment. Edmondson (1999; Edmondson & Moingeon, 1999), for example, has shown the beneficial effects of psychological safety and trust for team and organizational learning. If organizational members hold a shared belief that their environment is safe for interpersonal risk taking, they are more likely to engage in learning behaviors. An absence of trust and safety is likely to lead to constraints or even complete elimination of any critical assessment of changes.

In general, trust and also leeway to explore and experiment imply the possibility of making mistakes. Learning from mistakes and errors is a key aspect of experiential learning (Kolb, 1984). Research on error management and the productive use of errors has revealed some beneficial effects of analyzing the informative characteristics of error making. During training, for example, the possibility to make and utilize errors significantly affects the speed and comprehensiveness of learning (Frese, 1995). Individuals and groups that are encouraged to make errors perform better on a subsequent test than those that are discouraged (Heimbeck, Frese, Sonnentag, & Keith, 2003). In his work on error management, Frese (1995) initially focuses on the individual level, using errors as the independent variable, in order to then speculate about the organizational level. He uses the term 'reflective withdrawal' as a constructive reaction induced by error making. This conceptualization corresponds to the awareness variable of the present research focus. Reflective withdrawal in the context of making errors appears to fulfill a role similar to that of functional awareness in the context of resistance. As shown empirically, the sequence of error, reflective withdrawal, and learning led to improved results. However, these positive effects of error making were only attained when errors were not punished or even actively encouraged.

Linking the error literature with the topic of organizational learning, Lipshitz et al. (2002) particularly emphasizes the aspect of culture. They state that "tolerance for error is management's principal contribution to psychological safety" (p. 89), and elaborate on the productive use of errors. The suggestion that errors in the service of learning

should not be punished but valued as opportunities for learning is captured in the following tale:

> "At the heart of [learning] ... is a mindset ... that enables companies to recognize the value of productive failure as opposed to unproductive success .... A young manager, after losing $ 10 million in a risky venture was called into [IBM's legendary founder] Thomas Watson's office. The young man, thoroughly intimidated, began by saying, "I guess you want my resignation." Watson replied "You can't be serious. We just spent $ 10 million educating you." (Garvin, 1993, p. 85-86, as cited in Lipshitz et al., 2002)

While these authors focus on learning from errors, their assumptions might be easily adaptable to the discussion on learning from resistance. This becomes apparent in Lipshitz et al.'s (2002) further exploration of the implications of productive error use for organizational learning. For example, it is proposed that learning from errors is more easily facilitated if errors are critical or costly to the organizational operations. If the cost of errors is hard to quantify or will only show in the long run, learning might not be triggered immediately and effectively. In contrast, learning from error is of utmost importance in environments in which people routinely face potentially catastrophic errors, such as nuclear power plants (Carrol, 1995) or fighter flight units (Popper & Lipshitz, 1998). Related to the present study, resistance against the SAP implementation would not have critically endangered the operations of the organization. Being the fourth implementation at a national subsidiary that generates only a fraction of the company's revenues and profits, the possibility of something going wrong during the change would hardly have been assessed as life threatening by management at headquarters. Hence, the detected disinterest in learning might well be an effect of the little criticality of the change at R&P UK. This observation then implies a relationship between the criticality of a change to organizational operations and the impact of resistance on learning. Accordingly, organizational learning from resistance to change will to some extent be a function of the criticality of the change.

The idea of change criticality as a determinant of learning by resistance is supported by the pain analogy. If acute pain indicates a threat to survival, rather than a mere nuisance to the current activity, it will lead to heightened arousal and awareness, and will require immediate action and learning. In the same way, resistance during a critical change might instill a crisis mentality in the organization, thereby making it more conducive to learning. However, such a crisis mentality might also result in the exact opposite effect of restricted information processing and constricted control, as described in

the thread-rigidity hypothesis of organizational behavior (Staw, Sandelands, & Dutton, 1981).

Related to the context of using errors productively and learning from resistance is the literature on conflict management. While errors mostly relate to concrete tasks, conflict usually revolves around broader sets of issues or behaviors. However, the concept of conflict is still narrower in focus than resistance, and concentrates on individuals and groups that are negatively affected by other individuals and groups (Thomas, 1992). While resistance pertains to all three levels of analysis, errors and conflict are generally researched at the individual and group level, although the organizational level is increasingly becoming a focus of interest. Conflict, like resistance, has a history of being treated as a pathological state, and only recently has there been a shift of attention toward the productive use of conflict (De Dreu & Van de Vliert, 1997). Growing evidence shows that conflict may be beneficial to performance in groups and organizations, and that avoiding and suppressing conflict reduces individual creativity, decision quality in teams, product development, and communication between work groups (De Dreu, 1997). For the present purposes, the main finding that is extracted from conflict research is that the key to understanding productive conflict seems to be a distinction between cognitive and affective issues. Conflict over task-related issues, such as scarce resources or procedures, appears to enhance group performance, while conflict over social-emotional issues, such as values and identity, reduces performance and satisfaction (Jehn, 1995; Simons & Peterson, 2000). More generally, group interaction and dialogue, that is group learning, seem to benefit from cognitive but not from affective disagreement and dispute.

As emergences of resistance to change usually involve conflict, the treatment of resistance might influence the type of ensuing conflict. First of all, if a culture of suppression and fear is the result of overcoming resistance, it can be assumed that any conflict still surfacing will reflect the emotional essence of such a culture. There can also be, of course, emotional resistance, that is, a resistance not grounded in rational opposition but in affective antagonism. In such cases, resistance will probably involve emotional conflict irrespective of how it is handled. However, in cases where resistance is founded in rationality, inconsiderately overcoming it must be expected to lead to rather emotional responses. On the basis of the discussion so far it is therefore speculated that not heeding resistance is more likely to lead to affective than to cognitive conflict. In this respect, the promotion of a functional understanding of resistance might not only

prevent a suppressive reaction by management, but might also facilitate the prevalence of the cognitive type of conflict.

In sum, if a conscious or unconscious decision is made to not heed resistance, the opportunity cost of this decision might be the furtherance of an organizational culture that is not conducive to learning. The discussion above illustrated that a lack of heed for resistance might not only be associated with stifling learning in general, but consequently also with negatively affecting employee morale and motivation, decreasing psychological safety and trust, diminishing communication, and lower productivity and reduced output. Finally, it was shown that the literatures on error and conflict management hold a distinct potential to stimulate research on learning by resistance.

5.2 THE INTEGRATED FRAMEWORK OF LEARNING AND MEMORY

In this section, the proposed integrated framework of learning and memory across levels of analysis (*Figure 1.5*, p. 80) will be discussed in the light of the empirical results. The framework was developed as a result of the described fragmentation of organizational learning theory, and in order to illustrate and summarize the theoretical understanding of organizational learning in this thesis. Three levels of analysis are distinguished, and information processing at each level is defined. At the individual level, learning was described as cognition, at the group level as communication through action or verbalization, and at the organizational level as formalization. Memory components were depicted as individual memory, transactive group memory, and organizational memory, respectively. The process model illustrates an integrated feed forward sequence that also includes feedback loops. Influential individuals might circumvent the group level, and learning is lost when individual learning is not translated into observable behavior and when especially experienced members leave the organization.

The framework was developed as a structuring device that may systematize theory building in the realm of organizational learning. Although the present empirical study was by no means a proper test of the process model, the results provide some idea about the feasibility of the framework as a descriptive representation, and of the applicability of its components.

At the individual level, the learning and memorizing that was reported related mainly to the training in the SAP system. It was naturally difficult for respondents to retrospectively describe and appraise their own cognition during the interviews. Hence, a future assessment might have to utilize methods that provide a closer analysis of the given tasks. Individual learning to use a computer system could, for example, be observed in situ while subjects verbalize their experience, and then evaluated afterwards with a performance test (Heimbeck et al., 2003). However, the experiential learning cycle in the model seems to well represent the individual learning process in the project, as respondents frequently illustrated their 'learning-by-doing' practices. In addition, lost learning as a component at this level was reported through references to employees leaving the company.

Group level learning as proposed in the model was also found in the project. Sharing, interaction, and dialogue were reported as the essence of learning in the group. The portrayal of perceived experts on different components of the new computer software indicates the existence of a transactive memory system. Customer service representatives at R&P UK learned in the group by talking to and observing one another. The interaction at the group level fed back and informed individual experiences with the computer system.

While there is adequate replication of the framework at the individual and group level, the results for learning at the organizational level might indicate a necessary refinement of the proposed conceptualization. Learning on the new system was partially consolidated in formal documentation, although this formalization was undertaken in a very unsystematic way. The assumption that learning at the organizational level is rather a matter of consolidation than creation of knowledge was confirmed insofar as there was no content in the documents that indicated learning over and above the issues already mentioned in the interviews. The prevalence of technical information in the project documentation demonstrated, however, that the examination of documentation in order to determine learning at the organizational level might be problematic. Not everything that is formalized is automatically an indicator of learning. A necessary distinction between content that is specific to learning and irrelevant content will have to be made depending on the specific setting. Ideally, this distinction would be made on the basis of a longitudinal study, in which the feed forward of learning across levels is examined, and in which formalized content could be compared to issues that have come to the fore at the individual and group level. Furthermore, not all documentation is the same, as

there are varying degrees of formality and 'officialness'. One might therefore speculate whether more learning has gone into a document that is very official, such as a shareholder report as opposed to an internal memo. On the other hand, official documents might be extremely streamlined or even censored, such as press statements in some circumstances. Comparatively more prior learning might also precede documentation that is rated as confidential, or documentation that is applicable to the entire organization rather than to just a specific unit. Answers to these speculations will have to be empirical, involving the exact specification of given settings, and the tracking of paper trails. Therefore, it is concluded here that there are few universally applicable rules concerning the identification of consolidated learning in formalized documentation. Instead, the particular analysis will depend on the setting of the given enquiry. However, a longitudinal assessment that is able to follow a learning issue across levels of analysis is expected to generate more robust results in this context.

One observation that should receive specific attention is the fact that there was no official evaluation of the change project at R&P UK. Such an activity could be expected to significantly increase the learning content in the documentation. Lipshitz et al. (2002) describe post project reviews as important mechanisms of organizational learning, since they combine preceding learning at lower levels with a final consolidation, dissemination, and official status. Post project reviews might also illustrate a link between sharing at the group level and formalization at the organizational level, as they are usually produced by a team of evaluators. In contrast, the managers in the present study spent seven times more words in their retrospective accounts on the topic of planning than on their evaluation of the project, as was revealed by the word counts of the interview data.

The findings also raised awareness about some influences on the flow of learning across levels of analysis, namely organizational hierarchy and possibly internal politics. The detrimental effect of a distinct hierarchy on upward communication and feedback was already discussed in section 5.1.1. The proposed framework illustrates organizational learning as requiring not only interaction (at the group level), but also interrelation between levels of analysis. Communicative feed forward and feedback processes link the levels, and genuine organizational learning includes learning at a minimum of two levels of aggregation. In contrast, a hierarchical system seems to unlink the levels of analysis, place formal barriers between them (Glauser, 1984; Salaman, 2001), or increase the distance the communication has to travel to reach its intended recipients (de

Cock, de Witte, & van Nieuwkerke, 1998). On the other hand, hierarchies seem to have some positive effects on memory functions within organizations, as they have been associated with the storage of group learning (Romme, 1997) and the buffering of the effect of high turnover rates on organizational knowledge (Carley, 1992). As a result of such varying suggestions, the influence of hierarchy on the learning model warrants further attention in subsequent studies.

Another potentially decisive influence on the intra-organizational flow of learning is internal politics (Coopey & Burgoyne, 2000; Vince, 2001). The process model describes the aspect of sharing and integration across units and levels of analysis as crucial. However, different interest groups within the organization might show varying degrees of willingness to contribute to the exchange and processing of information. Consequently, internal politics are expected to mostly affect the integrative aspect of organizational learning, that is the feed forward and feedback of learning and knowledge. Internal politics were not found to be an influential factor in the present study, especially not for group learning in the customer service department. The centralization of decision authority at headquarters was more of an explicit consolidation of power than a reflection of political motivation. Similarly, issues such as the relationship between headquarters and subsidiary, or the dismissal of the subsidiary's general manager, were frequently mentioned but not described as involving political deliberation.

Finally, the value of the framework for theory building about organizational learning should be briefly assessed. It has been said that the framework integrates suggested components of organizational learning into a coherent whole. The inherent descriptions of processes include explanations of how one event gives rise to the next, temporally subsequent, event. Such descriptions constitute a process theory, as opposed to a variance theory, in which an increase in an independent variable is theorized to cause an increase in some dependent variable (Mohr, 1982). The proposed essential processes of learning and memory were found in the empirical data. As a structuring device, the framework eases the identification and location of facilitators and inhibitors of the flow of learning across level of analysis. Individual motivation, psychological safety, unhindered communication, and a culture of indifference or fear were some of the issues mentioned in this respect. Further research will expand this list.

A possible specification was suggested in section 5.1.2 regarding the degree of 'penetration' of learning at the individual and group level. This threshold question could

be formally integrated, but it is argued here not to over-specify the model in order to not constrain further exploration. As many more empirical observations are required to assess the made propositions, it is essential to keep the model flexible enough so that it can be adapted to varying circumstances.

5.3 CONCLUDING REFLECTIONS

This thesis contributes to the literatures on resistance to change and organizational learning. In particular, it links two concepts that have not been associated in a analytical study before. This link was facilitated by a new conceptualization of organizational learning processes and by an elaboration of the understanding of the signal function of resistance in organizational change processes. Other constructs such as errors or general conflict have been considered as potential sources of learning. The novel value of this thesis is constituted by the independent critical power that has been applied to a systematic assessment of the input function of resistance to change for learning beyond the individual level.

In the following section concluding reflections are made about the limitations of the research process and the obtained results. Finally considerations about further research are elaborated and new hypotheses are proposed.

5.3.1 Limitations

The present study is a first step in establishing learning by resistance as a combined phenomenon in the literatures on organizational learning and resistance to change. Additional conceptual and empirical work is needed to refine and extend the described ideas before more solid conclusions may be drawn. In order for this to be adequately contextualized, it is important to illustrate the limits of the obtained empirical findings and theoretical propositions. These limits will be elaborated from the general to the more specific in the following.

First of all, the nature of the present study in terms of theory building needs to be discussed. Weick (1979, p. 36) describes methodological trade-offs in theory building by illustrating the commensurate complexity of the research process through the face of

a clock. The adjectives 'general', 'simple', and 'accurate' are inscribed at twelve, four, and eight o'clock respectively. This is to demonstrate that any research in the social sciences, or the theory underlying it, cannot combine generality, accuracy, and simplicity at the same time (Thorngate, 1976). For example, experimental laboratory studies, placed at six o'clock, are simple and accurate, but have questionable generalizability. Multiple qualitative field studies are located at two o'clock, combining generalizability and accuracy, but lacking in simplicity. The present single case study would be placed at four o'clock; it is accurate, but complex and specific. In the light of this illustration, Cialdini (1980) proposes that theory building should start by multiple, real-world observations (i.e. general and accurate data), proceed to testing hypotheses in the laboratory (i.e. simple and accurate data), and finally move towards multiple quantitative field observations (i.e. simple and general data). Hence, the present study is at the very beginning of the full cycle with a focus on exploration and accurate description. Further mainly qualitative field observations should follow that substantiate the inductive theory initiated here. Once a number of hypotheses are firmly established (some of which are suggested in the next section), anticipated relationships between variables can be isolated and tested. In the long run, cycling between induction and deduction, and in effect integrating qualitative and quantitative data, will not only increase the validity of individual findings, but also build theory that is not limited by the trade-offs of single methodologies (Fine & Elsbach, 2000).

Apart from resistance and awareness, the research focus included the variable of organizational learning, which was structured procedurally by means of an integrated framework. The components of this framework were explored selectively in this study, for example group learning or organizational memory. As the topic of organizational learning is multifaceted, the relevant literature reveals a specialization into levels of analysis and sub-processes. In further studies, a narrowing-down of the initial broad focus is advisable, in order to develop sound conclusions about the nature of and the relationships between individual components of the framework. Such as strategy also seems sensible because empirical research on organizational learning as an organization-wide phenomenon faces the difficulty of requiring a scope for the entire organization. Since access and decision control for researchers in professional organizations is mostly limited, there is rarely a possibility to bring an entire organization to a halt in order to study its learning processes. Overall, the main contribution of the present study in regards to

organizational learning is to set a research agenda and provide broad directions and implications for further research to drill down on specific aspects. The integrated framework does this by breaking the general phenomenon into components and relationships that may be analyzed separately. However, the illustrative value of the framework is largely conceptual and requires further theoretical and empirical corroboration.

Another aspect of the more general limitations and areas of improvement of the study concerns the examination of resistance. It was found that the term resistance has largely negative connotations. Accordingly, managers in the UK suggested at the final results presentation that this is too emotive a term to be used routinely in such a research project. Instead, it was discussed to defuse 'resistance' in future research attempts by using a different terminology (e.g. attitudes to change), or by at least not labeling the entire project with the concept. Considering the research process, in the present case resistance was observed in retrospect as opposed to an in situ analysis. Due to the manageable time span between the end of the change and the beginning of the data collection, memories were still relatively fresh among project participants and documentation was still available. But there is certainly a temporal threshold after which an organizational change becomes too distant to invoke detailed memories or find comprehensive archival information. Analyzing resistance in situ, however, might be more complicated because of the problem of getting access and because of respondents' situational and emotional reactions to an investigation about an ongoing change. On the other hand, in the present case only the documentation allowed for an analysis of events over time that was not confounded by respondents' memory capabilities or their selective retrieval. Hence, direct data collection with respondents over the course of a project would have added a more genuine longitudinal aspect.

A clear limitation of the study regarding the specific aspect of obtainable data is the lack of both independent data on the resistance variable and true group level data for the existence and intensity of awareness and for learning, as shown in *Table 3.2* (p. 138). These issues have been elaborated several times in previous sections (i.e. in sections 3.1, 3.4.1, and 4.2), and measures to alleviate them were provided. While especially the data coverage of resistance was suboptimal, this did not critically influence the findings on the rest of the research focus, since actual resistance in the project was examined as a mere stimulant to the variable sequence. Moreover, the discovered minimal degree of resistance in the project revealed interesting aspects about the constrain-

ing influence of contextual factors. Nevertheless, in future studies it should be attempted to obtain direct data for all variables of interest.

The three methods used for the data collection differed in regards to their feasibility of application and adequacy for the variables of interest. Interviews and the collection of documentation proved to be appropriate for the setting and comparatively easy to conduct or collect. Repertory grids on the other hand were more problematic, because the method is unknown to most people, potentially threatening due to its 'psychological' imagery, and cumbersome to conduct. Especially for controversial topics like resistance, the method can lead respondents to suspect that they are being made to reveal information that they would be able to control otherwise. This was illustrated by the UK manager who refused to cooperate in the repertory grid exercise (see section 3.3.5, p. 133, and section 3.4.4, p. 150). Moreover, the different manifestations of resistance that were used as elements had unclear boundaries in some cases. As a result, intangible, abstract, and possibly overlapping constructs such as manifestations of resistance seem less appropriate for the repertory grid method than tangible entities. For example, grids are often used in market research to evaluate different products. In comparison, respondents will clearly find it easier to generate evaluative dimensions for effortlessly distinguishable automobiles than for expressions of resistance to change. Despite the difficult applicability of the method to the present research context, it generated important insights on the resistance variable. However, for future studies the issue of how abstract a set of constructs might seem to respondents should be considered further in advance.

5.3.2 Considerations for further research

The discussion in this fifth chapter exhibited several areas where future studies could advance conceptual clarity and attempt empirical substantiation. In the final section I will explore some considerations for further research, which derive from the findings of the present study.

The initial research focus consisted of a sequence of resistance, awareness, and learning, in which all three variables were presumed to be influenced by contextual factors. On the basis of the obtained results, the structure of this sequence can now be amended. Three variables or effects in particular emerged that are suggested for further investigation, namely organizational culture, hierarchy, and double-loop learning. *Figure 5.1* below shows the extended research focus.

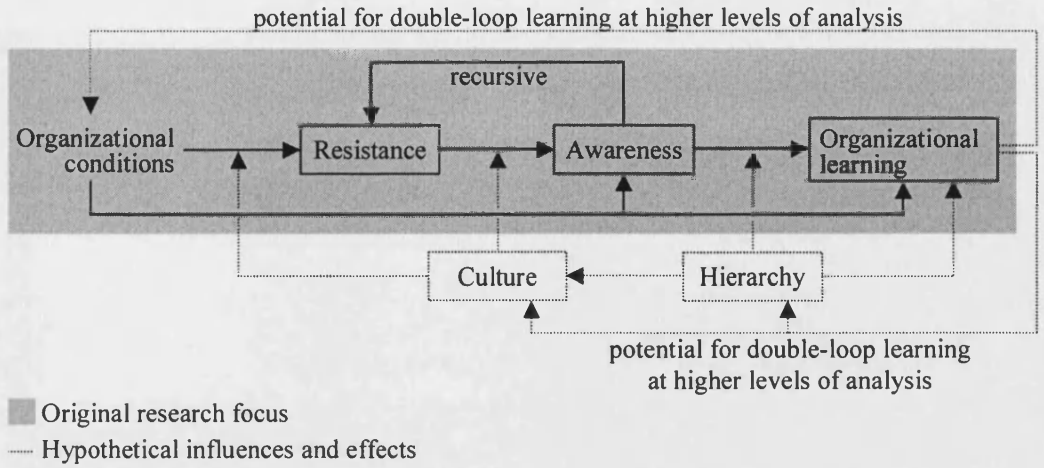


Figure 5.1: Hypothetical influences and effects

Culture and hierarchy are included as moderating effects on the original sequence, while a potential for double-loop learning is depicted as a result of learning at higher levels of analysis. Double-loop learning as an evaluation of underlying values and principles is expected to not only have an effect on organizational conditions, but also to influence culture and hierarchy. As the single- versus double-loop assumptions were discussed before in section 5.1.3, this will not receive repeated elaboration here. The suggested influence of culture and hierarchy, however, needs more explanation.

In section 5.1.4 on the opportunity costs of not heeding resistance, organizational culture was presented as a crucial influence on whether employees care or dare to resist and subsequently learn. The finding that resistance was not perceived as a viable option in the analyzed project sheds light on the influence of organizational culture on the treatment of resistance, both in terms of its emergence and effects. It is hypothesized that organizational culture has the potential to influence two relationships: The relationship between organizational conditions and resistance, that is whether resistance emerges or not, and the relationship between resistance and awareness, that is whether resistance is recognized once it has emerged. It might be presumed that people in an explorative, feedback-oriented culture are more likely to engage in resistance behavior than people exposed to a control-oriented or indifferent culture. On the other hand, an organizational culture that is too suppressive might leave its members no other choice but to resist. Hence, the influence of culture on resistance could be expected to follow

an inverted U-shaped relationship. In addition, a feedback-oriented, open culture might similarly lead to greater awareness about emergences of resistance.

Pertaining to a suspected moderating influence of organizational culture, one possible question opening up another stream of research would be 'Do innovative companies have more of a resistance culture?'. Particularly the literature on productive conflict would suggest this (De Dreu & Van de Vliert, 1997). A potential research design would be a comparative questionnaire study using an organizational culture instrument (e.g. van der Post & de Coning, 1997) complemented by items relating to findings from qualitative work on resistance, such as the present study. The sample of organizations should then include 'innovators', such as product design companies (see for example Hargadon & Sutton, 1997), and 'administrators', such as bureaucratic monopolists. While the organization in the present study is located more on the 'administrator' end of the spectrum, it would be interesting to conduct a case study on an 'innovator' with the specific focus on detecting a 'resistance culture'. One aspect to look at would be whether in an 'innovator' organization people are more likely to associate resistance with potential learning and improvement, a cognitive link that was missing in the present study.

The influence of hierarchy on organizational learning was discussed in the previous section 5.2, especially the presumed detrimental effect of a distinct hierarchy on the flow of internal communication. The hierarchy variable shown in *Figure 5.1* is hypothesized to influence culture, the relationship between awareness and organizational learning, and organizational learning itself. A specific hypothesis stemming from the findings is that a stronger hierarchy hinders organizational learning, as it potentially unlinks the levels of analysis or places formal barriers between them. Comparative studies in hierarchical and non-hierarchical organizations could make it possible to isolate the variable, and provide insight into how the levels in the integrated framework correspond to the levels of a given organizational hierarchy. Varying the hierarchical influence in subsequent case studies would provide more clarity on this.

Further research on the integrated framework would greatly benefit from longitudinal research designs. As mentioned before, in the present study only the documentation provided a direct reflection of the development of the project over time. Observing a change project from beginning to end would provide genuine proximity to issues that unfold over time, such as the transfer of group learning to the formalization stage or the

feedback function of formalized knowledge for group and individual learning. Popper & Lipshitz (1998) also suggest to examine so-called organizational learning mechanisms (e.g. post-action reviews or the work of quality control units) over time, which might be an interesting way of systematically analyzing specific aspects of the framework. In addition, a longitudinal design could more closely reveal the different phases and influence of resistance over the course of a change project (Bauer, 1993).

Finally, some further conditions that might be beneficial for learning from resistance to occur will be discussed. The influences of organizational culture and hierarchy have already been mentioned in this respect. Three more aspects emerging from the findings are change criticality, task structure and flexibility, and tight or loose coupling of organizational components and processes.

In section 5.1.4 on opportunity costs of not heeding resistance it was presumed that the criticality of a change for an organization's functioning might determine the extent and intensity of learning from emergences of resistance. Consistent with this assumption, Lipshitz et al. (2002) state that illustrative research on organizational learning often comes from environments that are either dangerous or in which mistakes have severe consequences. Accordingly, learning by resistance might be more intense and readily observable for cases in which changes are critical or the environment is hazardous. In such cases where resistance is costly, awareness will increase and learning may be crucial for organizational survival. Examples of studies on nuclear power plants, hospital surgery wards, and fighter flight units were listed by the authors above (Lipshitz et al., 2002). Such examples suggest similar 'high criticality' settings for future inquiries on the present research focus. However, such a strategy might easily become infeasible due to high barriers to access.

Another influence on learning and resistance is task structure. Edmondson (1999, p. 378) assumes that team learning might greatly benefit from flexibility in task structure and completion. Under conditions of highly constrained tasks with tightly specified criteria for success, learning will not control much variance in performance. There is little room for information seeking, feedback is built into the task, and therefore sharing, interaction, and dialogue will become unnecessary after an initial brief learning phase. For example, a team working on an assembly line will not benefit from learning behavior or constructive resistance as much as an independent team with few inherent task constraints and uncertain criteria for success. This is true for the employees at R&P UK,

whose jobs essentially consist of taking orders from customers or maintaining the accounting operations of the company. The confined nature of their tasks seems to be a constraint on learning. Without the situational and task-related constraints, resistance might emerge more easily and individuals might more readily perceive this as a source of learning. Future research should therefore consider the utility of learning behavior across different task categories. Contrast could be achieved by choosing a setting that has not as much constraining structure. Particularly interesting might be design teams or research and development departments, as such units are more flexible and more crucially depend on learning. As mentioned above, such units and the environments they operate in might also permit or even require more of a 'resistance culture', that is a convention of task-related conflict and debate.

A final consideration in the discussion about conditions conducive to learning from resistance somewhat combines the hypothesized influences of task structure and hierarchy. The questions under which conditions resistance triggers learning and under which conditions learning travels quickly or slowly across levels of analysis might be directly related to the degree of interconnection of organizational elements and processes. Interconnection as tight or loose coupling in organizations has been related to accidents and catastrophes. For example, an organization combining tight coupling with high complexity is assumed to have a larger potential for catastrophic failure (Perrow, 1984). In the present case the proposed process framework and the empirical evidence suggest that both ends of the spectrum are required. Tight coupling is needed for communication to flow effectively and to facilitate feed forward and feed back processes between levels of analysis. Loose coupling is needed to ensure room for exploration, errors and mistakes, emergences of resistance, and constructive reflection. As a result, there should be tight coupling between levels of analysis, and loose coupling within. The strategy of contrasting different organizational settings in further case studies mentioned above could provide insight on this issue.

In sum, further research needs to substantiate the conclusions drawn in this study about organizational learning from resistance to change. Organizational culture, hierarchy, change criticality, task flexibility, and system coupling have been suggested as additional points of entry to the focal sequence. The effects of potential double-loop learning were also reflected and a recommendation was made for longitudinal designs. These considerations may guide my future research.

LITERATURE

Abernathy, W. J., & Wayne, K. (1974). Limits of the learning curve. *Harvard Business Review, 52*(5), 109-119.

Adams, J. S. (1965). Inequity in social exchange. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2, pp. 267-299). New York: Academic Press.

Alderfer, C. P. (1972). *Existence, relatedness and growth.* New York: Free Press.

Anand, V., Manz, C. C., & Glick, W. H. (1998). An organizational memory approach to information management. *Academy of Management Review, 23*(4), 796-809.

Anderson, J. R. (1995). *Learning and memory: An integrated approach.* New York: Wiley.

Applebaum, S. H., & Gallagher, J. (2000). The competitive advantage of organizational learning. *Journal of Workplace Learning, 12*(2), 40-56.

Argote, L. (1993). Group and organizational learning curves: Individual, system and environmental components. *British Journal of Social Psychology, 32*, 31-51.

Argote, L. (1999). *Organizational learning: Creating, retaining and transferring knowledge*. Boston: Kluwer Academic Publishers.

Argote, L., Beckman, S. L., & Epple, D. (1990). The persistence and transfer of learning in industrial settings. *Management Science, 36*(2), 140-154.

Argote, L., & Epple, D. (1990). Learning curves in manufacturing. *Science, 247*(4945), 920-924.

Argote, L., Gruenfeld, D., & Naquin, C. (2001). Group learning in organizations. In M. E. Turner (Ed.), *Groups at work: Theory and research* (pp. 369-411). Mahwah, NJ: Erlbaum Associates.

Argote, L., & Ingram, P. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational Behavior and Human Decision Processes, 82*(1), 150-169.

Argyris, C. (1990). *Overcoming organizational defenses: Facilitating organizational learning*. Boston: Allyn and Bacon.

Argyris, C., & Schön, D. A. (1978). *Organizational learning: A theory of action perspective*. Reading, MA: Addison-Wesley.

Asch, S. E. (1952). *Social Psychology*. Englewood Cliffs, NJ: Prentice-Hall.

Bacharach, S. B. (1989). Organizational theories: Some criteria for evaluation. *Academy of Management Review, 14*(4), 496-515.

Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing construct validity in organizational research. *Administrative Science Quarterly, 36*, 421-458.

Bangerter, A., von Cranach, M., & Arn, C. (1997). Collective remembering in the communicative regulation of group action: A functional approach. *Journal of Language and Social Psychology, 16*(4), 365-388.

Bannister, D., & Mair, J. M. M. (1968). *The evaluation of personal constructs*. New York: Academic Press.

Bapuji, H. B., & Crossan, M. M. (2003). *From raising questions to providing answers: Reviewing organizational learning research.* Paper presented at the 5th International Conference on Organizational Learning and Knowledge, Lancaster, United Kingdom.

Barley, S. R. (1986). Technology as an occasion for structuring: Observations on CT scanner and other diagnostic technologies. *Administrative Science Quarterly, 31*, 78-108.

Barley, S. R. (1990). Images of imaging: Notes on doing longitudinal field work. *Organization Science, 1*(3), 220-247.

Bartlem, C. S., & Locke, E. A. (1981). The Coch and French study: A critique and reinterpretation. *Human Relations, 34*(7), 555-566.

Bateson, G. (1972). *Steps toward an ecology of mind.* S. Albany, Australia: Paladin.

Bauer, M. (1991). Resistance to change - A monitor of new technology. *Systems Practice, 4*(3), 181-196.

Bauer, M. (1993). *Resistance to change: A functional analysis of responses to technical change in a Swiss bank.* Unpublished Doctoral Dissertation, London School of Economics and Political Science.

Bauer, M. (1995a). 'Technophobia': A misleading conception of resistance to new technology. In M. Bauer (Ed.), *Resistance to new technology - nuclear power, information technology, biotechnology* (pp. 97-124). Cambridge: Cambridge University Press.

Bauer, M. (1995b). Towards a functional analysis of resistance to change. In M. Bauer (Ed.), *Resistance to new technology - nuclear power, information technology, biotechnology* (pp. 393-417). Cambridge: Cambridge University Press.

Bauer, M. (2000). Classical content analysis. In M. Bauer & G. Gaskell (Eds.), *Qualitative researching with text, image and sound: A practical handbook for social research* (pp. 131-151). London: Sage.

Bauer, M., Gaskell, G., & Allum, N. C. (2000). Quality, quantity and knowledge interests: Avoiding confusions. In M. W. Bauer & G. Gaskell (Eds.), *Qualitative researching with text, image and sound: A practical handbook for social research* (pp. 3-17). London: Sage.

Beals, L. B., Hoijer, H., & Beals, A. R. (1977). *An introduction to anthropology* (5th ed.). New York: Macmillan.

Beehr, T. A. (1995). *Organizational psychology.* Boston: Allyn and Bacon.

Bell, R. C. (1988). Theory-appropriate analysis of repertory grid data. *International Journal of Personal Construct Psychology, 1*, 101-118.

Bell, R. C. (1990). Analytic issues in the use of repertory grid technique. In G. J. Neimeyer & R. A. Neimeyer (Eds.), *Advances in personal construct psychology* (Vol. 1, pp. 25-48). Greenwich, Conn.: JAI Press.

Bell, R. C. (2000). A psychometric assessment of the bipolarity of constructs in repertory grid data. In J. W. Scheer (Ed.), *The person in society: Challenges to a constructivist theory* (pp. 141-149). Giessen: Psychosozial-Verlag.

Benkard, L. C. (1999). *Learning and forgetting: The dynamics of aircraft production.* Palo Alto, CA: Graduate School of Business, Stanford University.

Bertoin Antal, A., Dierkes, M., Child, J., & Nonaka, I. (2001a). Introduction: Finding paths through the handbook. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 1-7). New York: Oxford University Press.

Bertoin Antal, A., Dierkes, M., Child, J., & Nonaka, I. (2001b). Organizational learning and knowledge: Reflections on the dynamics of the field and challenges for the future. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 921-939). New York: Oxford University Press.

Bertoin Antal, A., & Krebsbach-Gnath, C. (2001). Consultants as agents of organizational learning: The importance of marginality. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 462-483). New York: Oxford University Press.

Billings, R. S., Klimoski, R. J., & Breaugh, J. A. (1977). The impact of a change in technology on job characteristics: A quasi-experiment. *Administrative Science Quarterly, 22*(2), 318-339.

Blackler, F., & McDonald, S. (2000). Power, mastery and organizational learning. *Journal of Management Studies, 37*(6), 833-851.

Boenisch, W. (1979). *Personale Widerstände bei der Durchsetzung von Innovationen.* Stuttgart: Poeschel.

Boerner, C. S., Macher, J. T., & Teece, D. J. (2001). A review and assessment of organizational learning in economic theories. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge creation* (pp. 89-117). New York: Oxford University Press.

Bood, R. P. (1998). Charting organizational learning: A comparison of multiple mapping techniques. In C. Eden & J.-C. Spender (Eds.), *Managerial and organizational cognition: Theory, methods, and research* (pp. 210-230). London: Sage.

Borg, I., & Groenen, P. (1997). *Modern multidimensional scaling.* New York: Springer.

Bower, G. H., & Hilgard, E. R. (1981). *Theories of learning.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

Breakwell, G. M. (2000). Interviewing. In G. M. Breakwell, S. Hammond & C. Fife-Schaw (Eds.), *Research methods in psychology* (2nd ed., pp. 239-250). London: Sage.

Breuer, J., & Freud, S. (1895). *Studien über Hysterie.* Wien: Deuticke.

Brown, J. S., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization Science, 2*(1), 40-57.

Brown, J. S., & Duguid, P. (2000). *The social life of information.* Boston, MA: Harvard Business School Press.

Brown, S. M. (1992). Cognitive mapping and repertory grids for qualitative survey research: Some comparative observations. *Journal of Management Studies, 29*(3), 287-307.

Bryman, A. (1988a). Introduction: 'Inside' accounts and social research in organizations. In A. Bryman (Ed.), *Doing research in organizations* (pp. 1-20). London: Routledge.

Bryman, A. (1988b). *Quantity and quality in social research.* London: Unwin Hyman.

Bryman, A. (Ed.). (1988c). *Doing research in organizations.* London: Routledge.

Buchanan, D., Boddy, D., & McCalman, J. (1988). Getting in, getting on, getting out, and getting back. In A. Bryman (Ed.), *Doing research in organizations* (pp. 53-67). London: Routledge & Kegan Paul.

Bundesministerium für Bildung und Forschung. (2004). *Lernende Regionen.* Retrieved 10 July 2004, from http://www.bmbf.de/de/414.php

Burell, G., & Morgan, G. (1979). *Sociological paradigms and organizational analysis.* London: Heinemann.

Burkhardt, M. E., & Brass, D. J. (1990). Changing patterns or patterns of change: The effects of a change in technology on social network structure and power. *Administrative Science Quarterly, 35*, 104-127.

Busby, J. S. (1999). The effectiveness of collective retrospection as a mechanism of organizational learning. *Journal of Applied Behavioral Science, 35*(1), 109-129.

Campbell, D. T. (1975). "Degrees of freedom" and the case study. *Comparative Political Studies, 8*(2), 178-193.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*, 81-105.

Campbell, D. T., & Stanley, J. (1966). *Experimental and quasi-experimental designs for research.* Chicago: Rand McNally.

Cangelosi, V. E., & Dill, W. R. (1965). Organizational learning: Observations toward a theory. *Administrative Science Quarterly, 10*, 175-203.

Cannon-Bowers, J. A., & Salas, E. (2001). Reflections on shared cognition. *Journal of Organizational Behavior, 22*, 195-202.

Carley, K. (1992). Organizational learning and personnel turnover. *Organization Science, 3*(1), 20-46.

Carrol, J. S. (1995). Incident reviews in high-hazard industries: Sensemaking and learning under ambiguity and accountability. *Industrial and Environmental Crisis Quarterly, 9*(175-197).

Casey, A. (1997). Collective memory in organizations. *Advances in Strategic Management, 14*, 111-146.

Cassell, C., Close, P., Duberley, J., & Johnson, P. (2000). Surfacing embedded assumptions: Using repertory grid methodology to facilitate organizational change. *European Journal of Work and Organizational Psychology, 9*(4), 561-573.

Chaston, I., Badger, B., & Sadler-Smith, E. (2000). Organizational learning style and competences. *European Journal of Marketing, 34*(5-6), 625-642.

Child, J., & Heavens, S. J. (2001). The social constitution of organizations and its implications for organizational learning. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge creation* (pp. 308-326). New York: Oxford University Press.

Cialdini, R. B. (1980). Full-cycle social psychology. In L. Bickman (Ed.), *Applied social psychology annual* (Vol. 1, pp. 21-47). Beverly Hills, CA: Sage.

Clegg, S. (1994). Power relations and the constitution of the resistant subject. In J. M. Jermier, D. Knights & W. R. Nord (Eds.), *Resistance and power in organizations* (pp. 274-325). London: Routledge.

Coch, L., & French, R. P. (1948). Overcoming resistance to change. *Human Relations, 1*, 512-532.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20*, 37-46.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences.* Hillsdale: Lawrence Earlbaum.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*, 128-152.

Contu, A., Grey, C., & Örtenblad, A. (2003). Against learning. *Human Relations, 56*(8), 931-952.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings.* Boston: Houghton Mifflin.

Cook, T. D., Campbell, D. T., & Peracchio, L. (1990). Quasi experimentation. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 1, pp. 491-576). Palo Alto, CA: Consulting Psychologists Press.

Coombs, C. H. (1964). *A theory of data.* New York: Wiley.

Coopey, J. (1995). The learning organization, power, politics and ideology. *Management Learning, 26*(2), 193-214.

Coopey, J., & Burgoyne, J. (2000). Politics and organizational learning. *Journal of Management Studies, 37*(6), 869-885.

Corbett, J. M. (2000). On being an elephant in the age of oblivion: Computer-based information systems and organizational memory. *Information Technology and People, 13*(4), 282-297.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*, 281-302.

Crossan, M., & Guatto, T. (1996). Organizational learning research profile. *Journal of Organizational Change Management, 9*(1), 107-112.

Crossan, M., Lane, H. W., & White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of Management Review, 24*(3), 522-537.

Crossan, M., Lane, H. W., White, R. E., & Djurfeldt, L. (1995). Organizational learning: Dimensions for a theory. *The International Journal of Organizational Analysis, 3*(4), 337-360.

Cyert, R. M., & March, J. P. (1963). *A behavioral theory of the firm* (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.

Daft, R. L., & Weick, K. E. (1984). Toward a model of organizations as interpretation systems. *Academy of Management Review, 9*(2), 284-295.

Davis, G. F., & Powell, W. W. (1992). Organization-environment relations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 3, pp. 315-375). Palo Alto, CA: Consulting Psychologists Press.

de Cock, G., de Witte, K., & van Nieuwkerke, S. (1998). Effective communication within the organization. In H. Thierry & P. Drenth (Eds.), *Handbook of work and organizational psychology* (2nd ed., Vol. 4, pp. 387-400). Hove, England: Psychology Press.

De Dreu, C. K. W. (1997). Productive conflict: The importance of conflict management and conflict issue. In C. K. W. De Dreu (Ed.), *Using conflict in organizations* (pp. 9-22). Thousand Oaks, CA: Sage Publications.

De Dreu, C. K. W., & Van de Vliert, E. (Eds.). (1997). *Using conflict in organizations*. Thousand Oaks, CA: Sage Publications.

de Geus, A. P. (1988). Planning as learning. *Harvard Business Review, 66*(2), 70-74.

DeFillippi, R., & Ornstein, S. (2003). Psychological perspectives underlying theories of organizational learning. In M. Easterby-Smith & M. A. Lyles (Eds.), *The Blackwell handbook of organizational learning and knowledge management* (pp. 19-37). Oxford: Blackwell.

Dent, E. B., & Goldberg, S. G. (1999a). Challenging "resistance to change". *Journal of Applied Behavioral Science, 35*(1), 25-41.

Dent, E. B., & Goldberg, S. G. (1999b). "Resistance to change": A limiting perspective. *Journal of Applied Behavioral Science, 35*(1), 45-47.

Denzin, N. (1989). *The research act* (3rd ed.). Englewood Cliffs: Prentice Hall.

Department for Education and Skills. (2004). *Lifelong learning*. Retrieved 10 July 2004, from http://www.lifelonglearning.co.uk/

Dewey, J. (1922). *Human nature and conduct*. New York: Holt.

Dierkes, M., Hoffmann, U., & Marz, L. (1996). *Visions of technology: Social institutional factors shaping the development of new technologies*. Frankfurt: Campus Verlag.

Dierkes, M., Marz, L., & Teele, C. (2001). Technological visions, technological development, and organizational learning. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 282-304). New York: Oxford University Press.

Dixon, N. (1994). *The organizational learning cycle: How we can learn collectively.* London: McGraw-Hill Book Company.

Dodgson, M. (1993). Organisational learning: A review of some literature. *Organisation Studies, 14*, 375-394.

Donaldson, L. (1995). *American anti-management theories of organization: A critique of paradigm proliferation.* Cambridge: Cambridge University Press.

Drory, A., & Romm, T. (1990). The definition of organizational politics: A review. *Human Relations, 43*(11), 1133-1154.

Dukes, W. F. (1965). N = 1. *Psychological Bulletin, 64*(1), 74-79.

Dumaine, B. (1994). Mr. Learning Organization. *Fortune, 130*(8), 75-81.

Duncan, R., & Weiss, A. (1979). Organizational learning: Implications for organizational design. In B. M. Staw (Ed.), *Research in organizational behavior* (Vol. 1, pp. 75-123). Greenwich, Conn.: JAI Press, Inc.

Dutton, J. E., & Jackson, S. E. (1987). Categorizing strategic issues: Links to organizational action. *Academy of Management Review, 12*(1), 76-90.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes.* Fort Worth: Harcourt Brace Jovanovich.

Easterby-Smith, M. (1997). Disciplines of organizational learning: Contributions and critiques. *Human Relations, 50*(9), 1085-1113.

Easterby-Smith, M., Thorpe, R., & Holman, D. (1996). Using repertory grids in management. *Journal of European Industrial Training, 20*(3), 1-30.

Easterby-Smith, M., Thorpe, R., & Lowe, A. (2002). *Management research* (2nd ed.). London: Sage.

Edmondson, A. C. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*, 350-383.

Edmondson, A. C. (2002). The local and variegated nature of learning in organizations: A group-level perspective. *Organization Science, 13*(2), 128-146.

Edmondson, A. C., & McManus, S. E. (2004). *Methodological fit in management field research.* Unpublished manuscript: Harvard Business School.

Edmondson, A. C., & Moingeon, B. (1999). Learning, trust and organisational change: Contrasting models of intervention research in organisational behaviour. In M. Easterby-Smith, J. Burgoyne & L. Araujo (Eds.), *Organizational learning and the learning organization* (pp. 157-175). London: Sage.

Edwards, P. K., & Scullion, H. (1982). *The social organization of industrial conflict.* London: Basil Blackwell.

Eisenberg, E. M. (1990). Jamming: Transcendence through organizing. *Communication Research, 17*(2), 139-164.

Eisenhardt, K. M. (1989a). Building theories from case study research. *Academy of Management Review, 14*(4), 532-550.

Eisenhardt, K. M. (1989b). Making fast strategic decisions in high velocity environments. *Academy of Management Journal, 32*(3), 543-576.

Epple, D., Argote, L., & Devadas, R. (1991). Organizational learning curves: A method investigating intra-plant transfer of knowledge aquired through learning by doing. *Organization Science, 2*(1), 58-70.

Eysenck, M. W., & Keane, M. T. (1995). *Cognitive psychology* (3rd ed.). London: Psychology Press.

Farr, R. (1984). Interviewing: The social psychology of the inter-view. In C. L. Cooper & P. Mankin (Eds.), *Psychology for managers* (2nd ed., pp. 182-213). London: Macmillan.

Filstead, W. J. (1979). Qualitative methods: A needed perspective in evaluation research. In T. D. Cook & C. S. Reichardt (Eds.), *Qualitative and quantitative methods in evaluation research.* Beverly Hills, CA: Sage.

Fine, G. A., & Elsbach, K. D. (2000). Ethnography and experiment in social psychological theory building: Tactics for integrating qualitative field data with quantitative lab data. *Journal of Experimental Social Psychology, 36,* 51-76.

Finger, M., & Brand, S. B. (1999). The concept of the 'learning organization' applied to the transformation of the public sector. In M. Easterby-Smith, L. Araujo & J. Burgoyne (Eds.), *Organizational learning and the learning organization* (pp. 130-156). London: Sage.

Fiol, C. M. (1994). Consensus, diversity, and learning in organizations. *Organization Science, 5*(3), 403-420.

Fiol, C. M., & Lyles, M. A. (1985). Organizational learning. *Academy of Management Review, 10*(4), 803-813.

Fleishman, E. A. (1965). Attitude versus skill factors in work group productivity. *Personnel Psychology, 18,* 253-266.

Flick, U. (1992). Triangulation revisited: Strategy of validation or alternative. *Journal for the Theory of Social Bahvior, 22*(2), 175-197.

Flick, U. (2002). Qualitative research - state of the art. *Social Science Information, 41*(1), 5-24.

Follett, M. P. (1982). *Dynamic administration: The collected papers of Mary Parker Follett* (2nd ed.). New York: Hippocrene Books.

Forster, N. (1994). The analysis of company documentation. In C. Cassell & G. Symon (Eds.), *Qualitative methods in organizational research: A practical guide* (pp. 147-166). Thousand Oaks, CA: Sage.

Frank, J. D. (1944). Experimental studies of pressure and resistance. *Journal of General Psychology, 30,* 23-64.

Fransella, F., & Bannister, D. (1977). *A manual for the repertory grid technique.* London: Academic Press.

Freeman, J. (1986). Data quality and the development of organizational social science: An editorial essay. *Administrative Science Quarterly, 31*(2), 298-303.

French, J. R. P., Israel, J., & As, D. (1960). An experiment on participation in a Norwegian factory. *Human Relations, 13,* 3-19.

Frese, M. (1995). Error management in training: Conceptual and empirical results. In S. Bagnara, C. Zucchermaglio & S. U. Stucky (Eds.), *Organizational learning and technological change* (pp. 112-124). Berlin: Springer.

Frese, M. (1998). Work and organizational psychology. In M. Eysenck (Ed.), *Psychology: An integrated approach* (pp. 624-668). Harlow, England: Addison Wesley Longman.

Frese, M., & Zapf, D. (1994). Action as the core of work psychology: A German approach. In H. C. Triandis, M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 4, pp. 271-340). Palo Alto, CA: Consulting Psychologists Press.

Froehlich, D., & Pekruhl, U. (1996). *Direct participation and organisational change.* Dublin, Ireland: European Foundation for the Improvement of Living and Working Conditions.

Gaines, B. R., & Shaw, M. L. G. (2001). *WebGrid III.* Retrieved 5 December 2003, from http://tiger.cpsc.ucalgary.ca:1500/WebGrid/WebGrid.html.

Galer, G., & van der Heijden, K. (1992). The learning organization: How planners create organizational learning. *Marketing Intelligence and Planning, 10*(6), 5-12.

Gammack, J. G., & Stephens, R. A. (1994). Repertory grid technique in constructive interaction. In C. Cassell & G. Symon (Eds.), *Qualitative methods in organizational research: A practical guide* (pp. 72-90). Thousand Oaks, CA: Sage.

Gardner, G. (1977). Workers' participation: A critical evaluation of Coch and French. *Human Relations, 30*(12), 1071-1078.

Garratt, B. (1987). *The learning organization.* Worcester: Gower.

Garvin, D. A. (1993). Building a learning organization. *Harvard Business Review*(4), 78-91.

Gaskell, G. (2000). Individual and group interviewing. In M. W. Bauer & G. Gaskell (Eds.), *Qualitative researching with text, image and sound* (pp. 38-56). London: Sage.

Gentner, D. (1983). Structure-mapping: A theoretical framework for analogy. *Cognitive Science, 7*, 155-170.

Gentner, D. (1989). The mechanisms of analogical reasoning. In S. Vosniadou & A. Ortony (Eds.), *Similarity and analogical reasoning* (pp. 199-241). Cambridge: Cambridge University Press.

George, J. M., & Jones, G. R. (2001). Towards a process model of individual change in organizations. *Human Relations, 54*(4), 419-444.

Gibson, C. B. (2001). From knowledge accumulation to accomodation: Cycles of collective cognition in work groups. *Journal of Organizational Behavior, 22*, 121-134.

Ginsberg, A. (1989). Construing the business portfolio: A cognitive model of diversification. *Journal of Management Studies, 26*(4), 417-438.

Ginsberg, A. (1990). Connecting diversification to performance: A sociocognitive approach. *Academy of Management Review, 15*(3), 514-535.

Gioia, D. A., & Sims, H. P. (Eds.). (1986). *The thinking organization.* San Francisco: Jossey Bass.

Glauser, M. J. (1984). Upward information flow in organizations: Review and conceptual analysis. *Human Relations, 8*, 613-643.

Gniech, G., & Grabitz, H. J. (1978). Freiheitseinengung und psychologische Reaktanz. In D. Frey (Ed.), *Kognitive Theorien der Sozialpsychologie* (pp. 48-73). Bern: Huber.

Goldstein, I. L. (1991). Training in work organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 2, pp. 507-619). Palo Alto, CA: Consulting Psychologists Press.

Goldstein, J. (1989). A far-from-equilibrium systems approach to resistance to change. *Organizational Dynamics, 17*(2), 16-26.

Grahek, N. (2001). *Feeling pain and being in pain.* Oldenburg: BIS-Verlag.

Guzzo, R. A., & Shea, G. P. (1992). Group performance and intergroup relations in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 3, pp. 269-313). Palo Alto, CA: Consulting Psychologists Press.

Hannan, M. T., & Freeman. (1988). *Organizational ecology.* Cambridge, MA: Harvard University Press.

Hargadon, A., & Sutton, R. I. (1997). Technology brokering and innovation in a product development firm. *Administrative Science Quarterly, 42*, 716-749.

Hartley, J. F. (1994). Case studies in organizational research. In C. Cassell & G. Symon (Eds.), *Qualitative methods in organizational research: A practical guide* (pp. 208-229). Thousand Oaks, CA: Sage.

Hedberg, B. (1981). How organizations learn and unlearn. In P. Nystrom & W. Starbuck (Eds.), *Handbook of Organizational Design* (Vol. 1, pp. 3-27). Oxford: Oxford University Press.

Hedberg, B., & Wolff, R. (2001). Organizing, learning, and strategizing: From construction to discovery. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 535-556). New York: Oxford University Press.

Heimbeck, D., Frese, M., Sonnentag, S., & Keith, N. (2003). Integrating errors into the training process: The function of error management instructions and the role of goal orientation. *Personnel Psychology, 56*, 333-361.

Hendry, C. (1996). Understanding and creating whole organizational change through learning theory. *Human Relations, 49*(5), 621-641.

Heracleous, L. (2001). An ethnographic study of culture in the context of organizational change. *Journal of Applied Behavioral Science, 37*(4), 426-446.

Hodgson, P. (1995). The learning organization. In S. Crainer (Ed.), *The Financial Times: Handbook of Management* (pp. 691-700). Great Britain: Pitman Publishing.

Hollingshead, A. B. (1998). Retrieval processes in transactive memory systems. *Journal of Personality and Social Psychology, 74*(3), 659-671.

Hollingshead, A. B. (2000). Perceptions of expertise and transactive memory in work relationships. *Group Processes & Intergroup Relations, 3*(3), 257-267.

House, R., Rousseau, D. M., & Thomas-Hunt, M. (1995). The meso paradigm: A framework for the integration of micro and macro organizational behavior. In L. L. Cummings & B. M. Staw (Eds.), *Research in Organizational Behavior* (Vol. 17, pp. 71-114).

Houston, J. P. (1991). *Fundamentals of learning and memory* (4th ed.). Los Angeles: Harcourt Brace.

Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science, 2*(1), 88-115.

Huber, G. P., Sutcliffe, K. M., Miller, C. C., & Glick, W. H. (1993). Understanding and predicting organizational change. In G. P. Huber & W. H. Glick (Eds.), *Organizational change and redesign* (pp. 215-265). New York: Oxford University Press.

Huczynski, A., & Buchanan, D. (2001). *Organizational behavior* (4th ed.). Harlow, England: Prentice Hall.

Hulin, C. L. (1991). Adaptation, persistence, and commitment in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 2, pp. 445-505). Palo Alto, CA: Consulting Psychologists Press.

Hultman, K. (1998). *Making change irresistible: Overcoming resistance to change in your organization.* Palo Alto, CA: Davies-Black.

Hutchinson, J., & Smith, A. D. (Eds.). (2000). *Nationalism: Critical concepts in political science.* New York: Routledge.

Huysman, M. (1999). Balancing biases: A critical review of the literature on organizational learning. In M. Easterby-Smith, L. Araujo & J. Burgoyne (Eds.), *Organizational learning and the learning organization* (pp. 59-74). London: Sage.

Isaacs, W. N. (1993). Taking flight: Dialogue, collective thinking, and organizational learning. *Organizational Dynamics, 22*(2), 24-39.

Jankowicz, D. (2003). *The easy guide to repertory grids.* Chichester: Wiley.

Jehn, K. A. (1995). A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly, 40*, 256-282.

Jelinek, M., & Litterer, J. A. (1994). Towards a cognitive theory of organizations. In J. R. Meindl, J. F. Porac & C. Stubbart (Eds.), *Advances in managerial cognition and organizational information processing* (Vol. 5, pp. 3-41). Greenwich, Conn.: JAI Press.

Jermier, J. M., Knights, D., & Nord, W. R. (1994a). Resistance and power in organizations: Agency, subjectivity and the labor process. In J. M. Jemier, D. Knights & W. R. Nord (Eds.), *Resistance and power in organizations* (pp. 1-24). London: Routledge.

Jermier, J. M., Knights, D., & Nord, W. R. (Eds.). (1994b). *Resistance and power in organizations*. London: Routledge.

Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly, 24*, 602-611.

Johns, E. A. (1973). *The sociology of organizational change*. Oxford: Pergamon.

Jones, M. (1995). Organisational learning: Collective mind or cognitivist metaphor? *Accounting, Management and Information Technology, 5*(1), 61-77.

Jost, M. G., & Bauer, M. (2003). *Organizational learning by resistance.* Paper presented at the 5th International Conference on Organizational Learning and Knowledge, Lancaster, England.

Jovchelovitch, S., & Bauer, M. W. (2000). Narrative interviewing. In M. W. Bauer & G. Gaskell (Eds.), *Qualitative researching with text, image and sound* (pp. 57-74). London: Sage.

Jung, C. G. (1976). *Gesammelte Werke: Die Archetypen und das kollektive Unbewusste* (Vol. 9/1). Olten: Walter.

Kanter, R. M. (1989). The new managerial work. *Harvard Business Review, 67*(6), 85-92.

Katz, D., & Kahn, R. L. (1978). *The social psychology of organizations* (Revised ed.). New York: John Wiley & Sons.

Katz, R. (1982). The effects of group longevity on communication and performance. *Administrative Science Quarterly, 27*, 81-104.

Kelly, G. A. (1955). *The psychology of personal constructs* (Vol. 1 and 2). New York: Norton.

Kieser, A. (1998). Unternehmenberater - Händler in Problemen, Praktiken und Sinn. In H. Glaser, E. Schröder & A. von Werder (Eds.), *Organisationsgestaltung an sich wandelnden Märkten* (pp. 191-225). Wiesbaden: Gabler.

Kieser, A., Beck, N., & Tainio, R. (2001). Rules and organizational learning: The behavioral theory approach. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 598-623). New York: Oxford University Press.

Kihlstrom, J. F. (1996). Memory research: The convergence of theory and practice. In D. J. Hermann, C. McEvoy, C. Hertzog, P. Hertel & M. K. Johnson (Eds.), *Basic and applied memory research: Theory in context* (Vol. 1, pp. 5-25). Mahwah, NJ: Erlbaum.

Kim, D. H. (1993a). *A framework and methodology for linking individual and organizational learning: Applications in TQM and product development.* Unpublished Ph.D. dissertation, MIT Sloan School of Management.

Kim, D. H. (1993b). The link between individual and organizational learning. *Sloan Management Review, 35*(1), 37-50.

Klein, D. (1969). Some notes on the dynamics of resistance to change. The defender role. In W. G. Bennis, K. D. Benne, R. Chin & K. E. Corey (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart, Winston, Inc.

Klein, J. I. (1989). Parenthetic learning in organizations: Toward the unlearning of the unlearning model. *Journal of Management Studies, 26*(3), 291-308.

Klein, J. I., Dansereau, F., & Hall, R. J. (1994). Levels issues in theory development, data collection, and analysis. *Academy of Management Review, 19*(2), 195-229.

Klimoski, R., & Mohammed, S. (1994). Team mental model: Construct or metaphor? *Journal of Management, 20*(403-437).

Kluge, A., & Schilling, J. (2000). Organisationales Lernen und Lernende Organisation - ein Überblick zum Stand von Theorie und Empirie. *Zeitschrift für Arbeits- und Organisationspsychologie, 44*(4), 179-191.

Knowles, E. S., Butler, S., & Linn, J. A. (2001). Increasing compliance by reducing resistance. In J. P. Forgas & K. D. Williams (Eds.), *Social influence: Direct and indirect processes*. London: Hove.

Kofman, F., & Senge, P. M. (1993). Communities of commitment: The heart of learning organizations. *Organizational Dynamics, 22*(2), 5-23.

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science, 3*(3), 383-397.

Kogut, B., & Zander, U. (1996). What firms do? Coordination, identity, and learning. *Organization Science, 7*(5), 502-518.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.

Kotter, J. P. (1995). Leading change: Why transformation efforts fail. *Harvard Business Review, 73*(2), 59-67.

Kotter, J. P. (1996). *Leading change*. Boston, MA: Harvard Business School.

Kotter, J. P., & Schlesinger, L. A. (1979). Choosing strategies for change. *Harvard Business Review, 57*(2), 106-114.

Krippendorff, K. (1980). *Content analysis: An introduction to its methodology*. London: Sage.

Kristof-Brown, A. L. (2000). Perceived applicant fit: Distinguishing between recruiters' perceptions of person-job and person-organization fit. *Personnel Psychology, 53*(3), 643-671.

Kuhn, T. S. (1996). *The structure of scientific revolutions* (3rd ed.). Chicago, IL: University of Chicago Press.

Labianca, G., Gray, B., & Brass, D. J. (2000). A grounded model of organizational schema change during empowerment. *Organization Science, 11*(2), 235-257.

LaNuez, D., & Jermier, J. M. (1994). Sabotage by managers and technocrats: Neglected patterns of resistance at work. In J. M. Jermier, D. Knights & W. R. Nord (Eds.), *Resistance and power in organizations* (pp. 219-251). London: Routledge.

Lawrence, P. L. (1954). How to deal with resistance to change. *Harvard Business Review, 32*(3), 49-57.

LeCompte, M. D., & Goetz, J. P. (2001). Problems of reliability and validity in ethnographic research. In A. Bryman (Ed.), *Ethnography* (Vol. 3, pp. 100-132). London: Sage.

Levinson, H., Price, C. R., Murden, K. J., Mandl, H. J., & Solley, C. M. (1962). *Men, management and mental health*. Cambridge, MA: Harvard University Press.

Levinthal, D. A. (1991). Organizational adaptation and environmental selection - interrelated processes of change. *Organization Science, 2*(1), 140-145.

Levinthal, D. A., & March, J. G. (1993). The myopia of learning. *Strategic Management Journal, 14*, 95-112.

Levitt, B., & March, J. G. (1988). Organizational learning. *Annual Review of Sociology, 14*, 319-340.

Lewin, K. (1943). Forces behind food habits and methods of change. *Bulletin of the National Research Council, 108*, 35-65.

Lewin, K. (1947a). Frontiers in group dynamics I: Concept, method and reality in social science; social equilibrium and social change. *Human Relations, 1*, 5-41.

Lewin, K. (1947b). Frontiers in group dynamics II: Channnels of group life, social planning and action research. *Human Relations, 1*, 143-153.

Lewin, K. (1951). *Field theory in social science*. New York: Harper & Row.

Liang, D. W., Moreland, R. L., & Argote, L. (1995). Group versus individual training and group performance: The mediating role of transactive memory. *Personality and Social Psychology Bulletin, 21*, 384-393.

Lienert, G. A., & Raatz, U. (1998). *Testaufbau und Testanalyse* (6th ed.). Weinheim: Beltz.

Lipshitz, R., Popper, M., & Friedman, V. J. (2002). A multifacet model of organizational learning. *Journal of Applied Behavioral Science, 38*(1), 78-98.

Lorsch, J. W. (1976). Managing change. In P. R. Lawrence, J. A. Seiler & J. C. Bailey (Eds.), *Organizational behavior and administration: Cases, concepts, and research findings* (Revised ed.). Homewood, IL: R. D. Irwin.

Luhmann, N. (1984). *Soziale Systeme*. Frankfurt am Main: Suhrkamp.

Mackenzie, K. D. (1994). The science of an organization. Part I: A new model of organizational learning. *Human Systems Management, 13*, 249-258.

Maier, G. W., Prange, C., & von Rosenstiel, L. (2001). Psychological perspectives of organizational learning. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 14-34). New York: Oxford University Press.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71-87.

March, J. G., & Olsen, J. P. (1975). The uncertainty of the past: Organizational learning under ambiguity. *European Journal of Political Research, 3*, 147-171.

March, J. G., & Olsen, J. P. (1979). *Ambiguity and choice in organizations* (2nd ed.). Bergen: Universitetsforlaget.

March, J. G., Schulz, M., & Zhou, X. (2000). *The dynamics of rules*. Stanford: Stanford University Press.

March, J. G., Sproull, L. S., & Tamuz, M. (1991). Learning from samples of one or fewer. *Organization Science, 2*(1), 1-13.

Marrow, A. J. (1969). *The practical theorist: The life and work of Kurt Lewin*. New York: Basic Books.

Marrow, A. J., Bowers, D. G., & Seashore, S. E. (1967). *Management by participation: Creating a climate for personal and organizational development*. New York: Harper & Row.

Marsden, D., & Littler, D. (2000). Repertory grid technique: An interpretive research framework. *European Journal of Marketing, 34*(7), 816-834.

Maslow, A. H. (1954). *Motivation and personality*. New York: Harper & Row.

McClelland, D. C. (1985). *Human motivation*. Glenview, IL: Scott Foresman.

McClelland, D. C., & Boyatzis, R. E. (1982). Leadership motive pattern and long-term success in management. *Journal of Applied Psychology, 67*, 737-742.

McElroy, M. W. (2000). Integrating complexity theory, knowledge management and organizational learning. *Journal of Knowledge Management, 4*(3), 195-203.

McGill, M. E., & Slocum, J. W. (1993). Unlearning the organization. *Organizational Dynamics, 22*(2), 67-79.

McGregor, D. (1960). *The human side of enterprise*. New York: McGraw-Hill.

McKenna, D. D., & Wright, P. M. (1992). Alternative metaphors for organization design. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 3, pp. 901-960). Palo Alto, CA: Consulting Psychologists Press.

Merron, K. (1993). Let's bury the term "resistance". *Organization Development Journal, 11*(4), 77-86.

Meyer, J. P., & Allen, N. J. (1997). *Commitment in the workplace: Theory, research and application*. Thousand Oaks, CA: Sage Publications.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage.

Miles, R. E., & Randolph, W. A. (1980). Influence of organizational learning styles on early development. In J. R. Kimberly & R. H. Miles (Eds.), *The organizational life cycle* (pp. 44-82). San Francisco: Jossey-Bass.

Miller, D. (1992). Environmental fit versus internal fit. *Organization Science, 2*, 159-178.

Miller , D. (1994). What happens after success: The perils of excellence. *Journal of Management Studies, 31*, 325-358.

Miner, A. S., & Mezias, S. J. (1996). Ugly duckling no more: Pasts and futures of organizational learning research. *Organization Science, 7*(1), 88-99.

Mintzberg, H., & McHugh, A. (1985). Strategy formation in an adhocracy. *Administrative Science Quarterly, 30*(2), 160-197.

Mitchell, J. C. (1983). Case and situation analysis. *Sociological Review, 31*(2), 187-211.

Mobley, W. H., Griffeth, R. W., Hand, H. H., & Meglino, B. M. (1979). Review and conceptual analysis of the employee turnover process. *Psychological Bulletin, 86*(3), 493-522.

Mohammed, S., & Dumville, B. C. (2001). Team mental models in a team knowledge framework: Expanding theory and measurement across disciplinary boundaries. *Journal of Organizational Behavior, 22*, 89-106.

Mohammed, S., Klimoski, R., & Rentsch, J. R. (2000). The measurement of team mental models: We have no shared schema. *Organizational Research Methods, 3*(2), 123-165.

Mohr, L. B. (1982). Approaches to explanation: Variance theory and process theory. In L. B. Mohr (Ed.), *Explaining organizational behavior* (pp. 35-70). San Francisco: Jossey-Bass.

Molinsky, A. L. (1999). Sanding down the edges: Paradoxical impediments to organizational change. *Journal of Applied Behavioral Science, 35*(1), 8-24.

Moreland, R. L. (1999). Transactive memory: Learning who knows what in work groups and organizations. In L. L. Thompson & J. M. Levine (Eds.), *Shared cognition in organizations: The management of knowledge* (pp. 3-31). Mahwah, NJ: Lawrence Erlbaum.

Moreland, R. L., & Levine, J. M. (1992). The composition of small groups. In E. J. Lawler, B. Markovsky, C. Ridgeway & H. A. Walker (Eds.), *Advances in group processes* (Vol. 9, pp. 237-280). Greenwich, CT: JAI.

Mueller, C. W., & Price, J. L. (1989). Some consequences of turnover: A work unit analysis. *Human Relations, 42*(5), 389-402.

Muhr, T. (1997). *Atlas/ti user's manual and reference*. Berlin: Scientific Software Development.

Mullins, L. J. (1999). *Management and organisational behaviour* (5th ed.). London: Pitman Publishing.

Nagel, E. (1961). *The structure of science : Problems in the logic of scientific explanation*. London: Routledge.

Neimeyer, G. J., & Neimeyer, R. A. (1982). Personal construct perspectives on cognitive assessments. In T. V. Merluzzi, C. R. Glass & M. Genest (Eds.), *Cognititve assessment* (pp. 188-231). New York: Guilford Press.

Nicolini, D., & Meznar, M. B. (1995). The social construction of organizational learning: Conceptual and practical issues in the field. *Human Relations, 48*(7), 727-746.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science, 5*(1), 14-37.

Nonaka, I., Toyama, R., & Byosiere, P. (2001). A theory of organizational knowledge creation: Understanding the dynamic process of creating knowledge. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 491-517). New York: Oxford University Press.

Nord, W. R., & Jermier, J. M. (1994). Overcoming resistance to resistance: Insights from a study of the shadows. *Public Administration Quarterly, 17*(4), 396-409.

Norusis, M. (2004). *SPSS 12.0 guide to data analysis*. Upper Saddle River, N.J.: Prentice Hall.

Numagami, T. (1998). The infeasibility of invariant laws in management studies. *Organization Science, 9*(1), 2-15.

Nystrom, P. C., & Starbuck, W. H. (1984). To avoid organizational crisis, unlearn. *Organizational Dynamics, 13*, 53-65.

Olivera, F. (2000). Memory systems in organizations: An empirical investigation of mechanisms for knowledge collection, storage and access. *Journal of Management Studies, 37*(6), 811-832.

Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington, MA: Lexington Books.

Oxford Reference Online. (1997). *A dictionary of finance and banking*. Retrieved 11 May 2004, from http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t20.e2658

Pawlowsky, P. (2001). The treatment of organizational learning in management science. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 61-88). New York: Oxford University Press.

Pawlowsky, P., Forslin, J., & Reinhardt, R. (2001). Practices and tools of organizational learning. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 775-793). New York: Oxford University Press.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. New York: Basic Books.

Pfeffer, J. (1993). Barriers to the advance of organizational science: Paradigm development as a dependent variable. *Academy of Management Review, 18*, 599-620.

Pfeffer, J. (1997). *New directions for organization theory*. New York: Oxford University Press.

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. New York: Harper and Row.

Piderit, S. K. (2000). Rethinking resistance and recognizing ambivalence: A multidimensional view of attitudes toward an organizational change. *Academy of Management Review, 25*(4), 783-794.

Pinch, T. (1996). The social construction of technology: A review. In R. Fox (Ed.), *Technological change: Methods and themes in the history of technology* (pp. 17-37). Amsterdam: Harwood.

Plaskoff, J. (2003). Intersubjectivity and community building: Learning to learn organizationally. In M. Easterby-Smith & M. A. Lyles (Eds.), *The Blackwell handbook of organizational learning and knowledge management* (pp. 161-184). Oxford: Blackwell.

Podsakoff, P. M., MacKenzie, S. B., Lee, J., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.

Polanyi, M. (1958). *Personal knowledge*. Chicago, IL: The University of Chicago Press.

Pondy, L. R., & Mitroff, I. I. (1979). Beyond open system models of organization. *Research in Organizational Behavior, 1*, 3-39.

Popper, M., & Lipshitz, R. (1998). Organizational learning mechanisms: A structural and cultural approach to organizational learning. *Journal of Applied Behavioral Science, 34*(2), 161-179.

Porras, J. I., & Robertson, P. J. (1992). Organizational development: Theory, practice and research. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 3, pp. 719-822). Palo Alto, CA: Consulting Psychologists Press.

Porter, M. E. (1998). *The competitive advantage of nations* (2nd ed.). London: Collier Macmillan.

Prange, C. (1999). Organizational learning - desperately seeking theory? In M. Easterby-Smith, L. Araujo & J. Burgoyne (Eds.), *Organizational learning and the learning organization* (pp. 23-43). London: Sage.

Prasad, A., & Prasad, P. (1998). Everyday struggles at the workplace: The nature and implications of routine resistance in contemporary organizations. *Research in the Sociology of Organizations, 15*, 225-257.

Prasad, P., & Prasad, A. (2000). Stretching the iron cage: The constitution and implications of routine workplace resistance. *Organization Science, 11*(4), 387-403.

Quinn, R. E. (1996). *Deep change: Discovering the leader within*. San Francisco, CA: Jossey-Bass.

Rapping, L. (1965). Learning and World War II production forms. *Review of Economics and Statistics, 47*, 81-86.

Reger, R. K. (1990). The repertory grid technique for eliciting the content and structure of cognitive systems. In A. S. Huff (Ed.), *Mapping strategic thought* (pp. 301-309). Chichester: Wiley.

Robbins, S. P. (2001). *Organizational behavior* (9th ed.). Upper Saddle River, NJ: Prentice Hall.

Roethlisberger, F. J. (1989). The Hawthorne experiments. In J. S. Ott (Ed.), *Classic readings in organizational behavior*. Belmont, CA: Brooks/Cole.

Romme, A. G. L. (1997). Organizational learning, circularity and double-linking. *Management Learning, 28*(2), 149-160.

Roth, G. (1992). *Organizational-level learning as culture and routines: A model for empirical and theoretical development.* Unpublished manuscript: MIT Sloan School of Management.

Rousseau & Paul AG. (2002). *Annual report 2002.* [the company name is a pseudonym].

Rousseau, D. M. (1989). Psychological and implied contracts in organizations. *Employee Responsibilities and Rights Journal, 2*(2), 121-139.

Salaman, G. (2001). A response to Snell: The learning organization: Fact or fiction? *Human Relations, 54*(3), 343-359.

Sammon, D., & Adam, F. (2000). *Towards a model of ERP software selection - widening the debate.* Paper presented at the 10th Annual BIT Conference, Manchester.

Schein, E. H. (1990). Organizational culture. *American Psychologist, 45*, 109-119.

Schein, E. H. (1993). On dialogue, culture, and organizational learning. *Organizational Dynamics, 22*(2), 40-51.

Schein, E. H. (1996). Kurt Lewin's change theory in the field and in the classroom: Notes toward a model of managed learning. *Systems Practice, 9*(1), 27-47.

Schmolze, R. (2000). *Resistance to change and flexible responses: Conducting action research with management consultants.* Unpublished Doctoral Dissertation, London School of Economics and Political Science.

Scott, J. C. (1985). *Weapons of the weak: Everyday forms of peasant resistance.* New Haven, CT: Yale University Press.

Scott, J. C. (1987). Resistance without protests and without organization: Peasant opposition to the Islamic Zakat and the Christian Tithe. *Comparative Studies in Society and History, 29*(3), 417-452.

Scott, W. R. (1992). *Organizations: Rational, natural, and open systems* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

Senge, P. M. (1990a). *The fifth discipline: The art and practice of the learning organization.* New York: Doubleday.

Senge, P. M. (1990b). The leader's new work: Building learning organizations. *Sloan Management Review, 32*(1), 7-23.

Shrivastava, P. (1983). A typology of organizational learning systems. *Journal of Management Studies, 20*(1), 7-28.

Simon, H. A. (1991). Bounded rationality and organizational learning. *Organization Science, 2*, 125-133.

Simons, T. L., & Peterson, R. S. (2000). Task conflict and relationship conflict in top management teams: The pivotal role of intragroup trust. *Journal of Applied Psychology, 85*(1), 102-111.

Sonntag, K. (1996). *Lernen im Unternehmen: Effiziente Organisation duch Lernkultur.* Muenchen: Beck.

Starke, F. A., Dyck, B., & Mauws, M. K. (2003). Coping with the sudden loss of an indispensable employee: An exploratory case study. *Journal of Applied Behavioral Science, 39*(2), 208-228.

Stata, R. (1989). Organizational learning - the key to management innovation. *Sloan Management Review, 30*(3), 63-74.

Staw, B. M., Sandelands, L. E., & Dutton, J. E. (1981). Threat-rigidity effects in organizational behavior: A multilevel analysis. *Administrative Science Quarterly, 26*, 501-524.

Staw, B. M., & Sutton, R. I. (1992). Macro organizational psychology. In J. K. Murnighan (Ed.), *Social psychology in organizations: Advances in theory and research* (pp. 350-384). Englewood Cliffs, NJ: Prentice-Hall.

Stein, E. W. (1995). Organizational memory: Review of concepts and recommendations for management. *International Journal of Information Management, 15*(2), 17-32.

Strauss, A. L. (1987). *Qualitative analysis for social scientists.* New York: Cambridge University Press.

Strebel, P. (1996). Why do employees resist change. *Harvard Business Review, 74*(3), 87-92.

Streicher, H. (1984). Die Angst des Vorgesetzten vor dem Computer. Akzeptanzprobleme des Top-Managements bei der Datenverarbeitung und neuen Bürotechniken. *Office Management, 11*, 1074-1078.

Sutton, R. I., & Staw, B. M. (1995). What theory is not. *Administrative Science Quarterly, 40*, 371-384.

Swieringa, J., & Wierdsma, A. (1992). *Becoming a learning organization.* Reading, MA: Addison-Wesley.

Taylor, F. W. (1911). *The principles of scientific management.* New York: Harper.

Tesch, R. (1990). *Qualitative research: Analysis types and software tools.* New York: Falmer.

The Boston Consulting Group. (1972). *Perspectives on experience.* Boston: Boston Consulting Group.

"The Economist". (2002, 4th May). Persuasion. *The Economist, 363,* 95-96.

Thomas, K. W. (1992). Conflict and negotiation processes in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., pp. 651-717). Palo Alto, CA: Consulting Psychologists Press.

Thorngate, W. (1976). "In general" vs. "it depends": Some comments on the Gergen-Schlanker debate. *Personality and Social Psychology Bulletin, 2*, 404-410.

Tjosvold, D. (1998). Co-operative and competitive goal approaches to conflict: Accomplishments and challenges. *Applied Psychology: An International Review, 41*, 285-342.

Tjosvold, D., Wedley, W. C., & Field, R. H. G. (1986). Constructive controversy, the Vroom-Yetton Model, and managerial decision-making. *Journal of Occuptional Behaviour, 7*, 125-138.

Tsang, E. W. K. (1997). Organizational learning and the learning organization: A dichotomy between descriptive and prescriptive research. *Human Relations, 50*(1), 73-89.

Tschan, F. (1992). Social markers in written action-related communication. In M. von Cranach, M. Doise & G. Mugny (Eds.), *Social representations and the social bases of knowledge* (pp. 78-85). Göttingen: Hogrefe.

Tsoukas, H. (1989). The validity of idiographic research explanations. *Academy of Management Review, 14*(4), 551-561.

Tsoukas, H., & Vladimirou, E. (2001). What is organizational knowledge? *Journal of Management Studies, 38*(7), 973-993.

van der Post, W. Z., & de Coning, T. J. (1997). An instrument to measure organizational culture. *South African Journal of Business Management, 28*(4), 147-168.

Van Maanen, J. (1988). *Tales of the field.* Chicago: University of Chicago Press.

Van Maanen, J., & Kolb, D. (1985). The professional apprentice: Observations on field work roles in two organizational settings. In S. B. Bacharach & S. M. Mitchell (Eds.), *Research in the sociology of organizations* (Vol. 4, pp. 1-33). Greenwich, Conn.: JAI Press.

Varela, F. (1979). *Biological autonomy.* Amsterdam: Elsevier.

Vera, D., & Crossan, M. (2004). Strategic leadership and organizational learning. *Academy of Management Review, 29*(2), 222-240.

Victor, B., & Stephens, C. (1994). The dark side of the new organizational forms: An editorial essay. *Organization Science, 5*(4), 479-482.

Vince, R. (2001). Power and emotion in organizational learning. *Human Relations, 54*(10), 1325-1351.

von Cranach, M., Ochsenbein, G., & Valach, L. (1986). The group as a self-active system: Outline of a theory of group action. *European Journal of Social Psychology, 16*, 193-229.

von Cranach, M., & Tschan, F. (1990). Mehrstufigkeit im zielgerichteten Verhalten von Organisationen. In F. Frey & I. Udris (Eds.), *Das Bild der Arbeit* (pp. 208-226). Bern: Huber.

von Krogh, G., Roos, J., & Slocum, K. (1994). An essay on corporate epistemology. *Strategic Management Journal, 15*, 53-71.

von Rosenstiel, L., & Koch, S. (2001). Change in socioeconomic values as a trigger of organizational learning. In M. Dierkes, A. Bertoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 198-220). New York: Oxford University Press.

Wacker, G. I. (1981). Toward a cognitive methodology of organizational assessment. *Journal of Applied Behavioral Science, 17*, 114-129.

Wall, P. (1999). *Pain: The science of suffering*. London: Weidenfeld & Nicolson.

Wall, T. D., & Jackson, P. R. (1995). New manufacturing initiatives and shopfloor job design. In A. Howard (Ed.), *The changing nature of work* (pp. 139-174). San Francisco: Jossey-Bass.

Walsh, J. P., & Ungson, G. R. (1991). Organizational memory. *Academy of Management Review, 16*(1), 57-91.

Walton, E. J. (1986). Managers' prototypes of financial firms. *Journal of Management Studies, 23*, 679-698.

Watson, J. B., & Rayner, R. (1920). Conditioned emotional reactions. *Journal of Experimental Psychology, 3*(1), 1-14.

Wegner, D. M. (1987). Transactive memory: A contemporary analysis of the group mind. In B. Mullen & G. R. Goethals (Eds.), *Theories of group behavior* (pp. 185-208). New York: Springer.

Wegner, D. M. (1995). A computer network model of human transactive memory. *Social Cognition, 13*(3), 319-339.

Wegner, D. M., Erber, R., & Raymond, P. (1991). Transactive memory in close relationships. *Journal of Personality and Social Psychology, 61*, 923-929.

Wegner, D. M., Guiliano, T., & Hertel, P. T. (1985). Cognitive interdependence in close relationships. In W. J. Ickes (Ed.), *Compatible and incompatible relationships* (pp. 253-276). New York: Springer.

Weick, K. E. (1979). *The social psychology of organizing* (2nd ed.). Reading, MA: Addison-Wesley.

Weick, K. E., & Quinn, R. E. (1999). Organizational change and development. *Annual Review of Psychology, 50*, 361-386.

Weick, K. E., & Roberts, K. H. (1993). Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly, 32*, 357-381.

Weick, K. E., & Westley, F. (1996). Organizational learning: Affirming an oxymoron. In S. R. Clegg, C. Hardy & W. R. Nord (Eds.), *Handbook of Organization Studies* (pp. 440-458). Thousand Oaks, CA: Sage Publications.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity.* New York: Oxford University Press.

Wenzler, I., & Chartier, D. (1999). Why do we bother with games and simulations: An organizational learning perspective. *Simulation and Gaming, 30*(3), 375-384.

Winslow, E. K. (1992). *The arrogance of the term resistance to change.* Ann Arbor, MI: University of Michigan.

Womack, J. P., & Jones, T. D. (1996). Beyond Toyota: How to root out waste and pursue perfection. *Harvard Business Review, 74*(5), 140-153.

Wright, T. P. (1936). Factors affecting the costs of airplanes. *Journal of the Aeronautical Sciences, 3*, 122-128.

Yelle, L. E. (1979). The learning curve: Historical review and comprehensive survey. *Decision Sciences, 10*, 302-328.

Yeo, R. (2002). Learning within organizations: Linking the theoretical and empirical perspectives. *Journal of Workplace Learning, 14*(3), 109-122.

Yin, R. K. (1994). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage.

Zander, A. (1950). Resistance to change - its analysis and prevention. *Advanced Management Journal, 15*(1), 9-11.

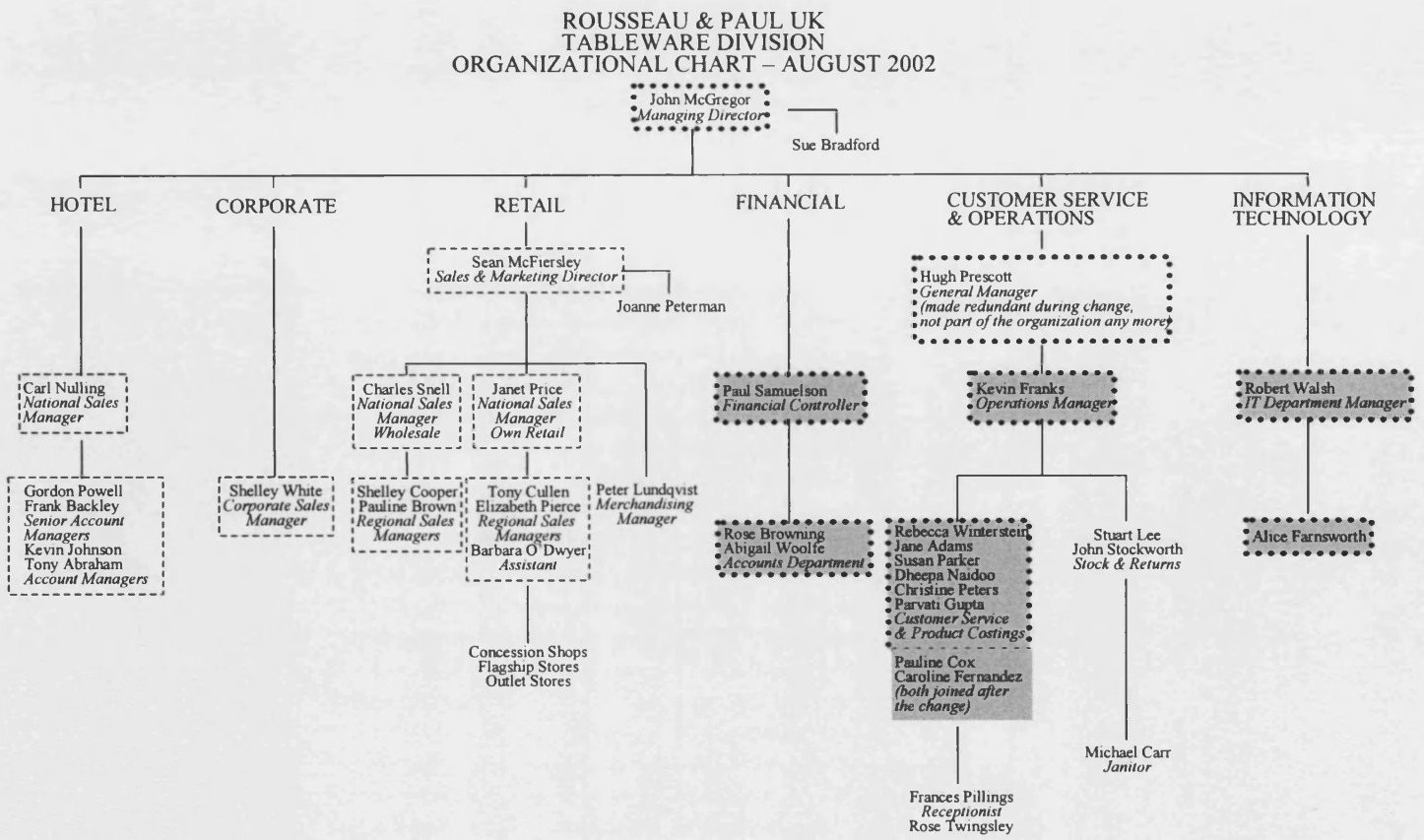
APPENDIX

APPENDIX A: DESCRIPTION OF PARTICIPANTS AT THE TIME OF DATA COLLECTION

Respondent	Position*	Area	Level in hierarchy	Length of tenure (m = 14.6)	Age (m = 47)	Gender
John McGregor	Managing director	General management	UK management	15	53	Male
Robert Walsh	IT development manager	IT	UK management	11	53	Male
Kevin Franks	Operations manager (deputy manager before change project)	Operations management/customer service	UK management	21	45	Male
Paul Samuelson	Financial controller	Accounting	UK management	29	56	Male
Hugh Prescott	General manager, now retired (made redundant during change project)	Operations management	UK management	18	57	Male
Christine Peters	Sales administrator	Customer service	UK employee	7	57	Female
Alice Farnsworth	Retail administrator (IT supervisor during the change)	Retail (IT during the change)	UK employee	17	35	Female
Jane Adams	Wholesale sales administrator	Customer service	UK employee	5	49	Female
Dheepa Naidoo	Sales administrator (credit administrator before change)	Customer service	UK employee	6	33	Female
Abigail Woolfe	Credit controller	Accounting	UK employee	9	36	Female
Susan Parker	Hotel ware administrator	Customer service	UK employee	14	55	Female
Rose Browning	Payroll and general ledger administrator	Accounting	UK employee	15	36	Female
Parvati Gupta	Sales administrator	Customer service	UK employee	4	59	Female
Rebecca Winter-stein	Assistant to operations manager	Customer service	UK employee	10	36	Female
Heinz Berwanger	Managing director logistics	Logistics	German management	17	42	Male
Peter Schmidtbauer	Managing director central IT, trading systems	IT	German management	33	49	Male
Manfred Becker	Customer service manager	Market service	German management	16	53	Male
Sabine Fischer	Regional manager customer service export	Market service	German management	15	42	Female

* The change implementation took place roughly one year prior to the data collection. Some respondents took on different job roles or changed areas in the mean time.

APPENDIX B: ORGANIZATION CHART R&P UK



APPENDIX C: INTRODUCTORY LETTER TO PARTICIPANTS

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London, 2 May 2003

Dear Rousseau & Paul employee,

As part of my doctoral dissertation at the London School of Economics, I am conducting a study on organizational learning and attitudes to change. The focus of the study is the past implementation of SAP R/3 at Rousseau & Paul in England.

With the help of the people that were actively involved or subsequently affected, I am trying to understand aspects of the implementation project. Of particular interest will be how the project unfolded, the effects of the new IT infrastructure on people's daily activities, and the lessons learned.

I would greatly appreciate the opportunity to interview you and discuss the implementation project. The interview should last approximately 60 minutes. It will be entirely confidential, and, with your consent, I will tape record it, as this makes my analysis much easier.

If you have any questions, please do not hesitate to contact me. I am looking forward to speaking to you soon.

Yours sincerely,

Gregor Jost

APPENDIX D: CONSENT FORM

CONSENT FORM

Project Organizational Learning and Attitudes to Change
(conducted by Gregor Jost)

The following interview is conducted under a strict code of ethics. Therefore the informed consent of participants is needed.

Please confirm that you were informed about the following issues:

1. The aims of the study have been explained to you, and you are willing to participate.
2. Any information you provide will be completely confidential. The tape recording will be typed out by Gregor Jost and then no one will have access to the interview transcript apart from Gregor Jost and his research colleague at the London School of Economics.
3. In the final research report the information you give us will be presented in such a way that no one can identify you - your participation in the study is anonymous.
4. If at any stage of the interview you decide you don't want to participate any more, you are free to say so.
5. You need to agree that you are happy for the interview to be tape-recorded.

If all goes according to plan the interview should take about one hour.

Are there any questions you want to ask about the study before signing the consent form?

DATE and NAME: _____

SIGNED: _____

APPENDIX E: INTERVIEW TOPIC GUIDE

1. Background questions
Name, age
Position
Length of tenure with company

2. Job description
What kind of job do you do here? Where do you work? Alone or with others (group)?
What are the daily activities of your job?

3. Describing the project (narrative)
Time scale of the project (start, end), milestones
How was the project communicated after the decision in Germany?
How did you experience the project?
How did you experience the changes to daily activities?
How did you experience changes to the entire organization due to the new IT infrastructure, or due to the warehouse closure? (e.g., relation to mother company, etc.)
How did this change and its implementation compare to other major changes (if there are any comparable ones)?

4. Aspects of Resistance to Change and Organizational Learning
Were there any obstacles to the implementation, i.e. technical difficulties, individuals not feeling comfortable with it, group consensus that the new system is inadequate, ambiguous messages from management, etc.?
Was there any resistance to the change? If so, at what level (e.g. mainly single individuals?), and how was that expressed, how was it communicated or dispersed within the organization?
What was the reaction to that resistance (who reacted, how, with what consequences)?

How was information about the changes communicated (group meetings, training sessions, tutoring, manuals, etc.)? How was the training conducted?
Was there a great deal of sharing of information or individual experience about the new system? How did that evolve? How was the learning passed on (e.g. from experts to non-experts)?
Was the new knowledge formalized or documented?

What would you say are the lessons learned from this project (e.g., about the functioning of the organization, organizational structure, customer relations, work processes etc.)? Any formal or systematic analysis?

5. Future
What is your future outlook on the development of the IT system?
What is going to happen to R&P UK in the future?

APPENDIX F: TOP-DOWN INTERVIEW CODING FRAME

TOPIC AREAS	BASIC CODES	THEMATIC CODES (n = 37)
Personal information Information on pers. background, job characteristics, and motivation	**Demographics and job description**	**Job description**: Job roles and responsibilities
		Demographics: Age, length of tenure, job title
		Commitment: Interest and commitment to the job
Description of the change Information about the change implementation, the new computer system, and internal organizational dynamics	**Organizational relations**	**System integration**: Interconnectivity and integration of the subsidiary into the company system
		Germany vs. UK: The relationship with headquarters
		Decision making: How decisions about the change projects were made
	The project	**Concerns**: Prior concerns about the change
		Prior implementations: Earlier implementations within other national companies of the organization
		Planning: Descriptions of the planning of the change
		Efficiency: Linking the two parts of the change (SAP implementation and warehouse closure)
		Managing the transition: Descriptions of how the transition was undertaken
		Redundancies: Layoffs resulting from the change
		IT in the UK: Effects of the change on the IT dept. in the UK
		Evaluation of change: Evaluative statements in retrospect
		Outlook: Outlook on future developments
	The new system	**Quality**: Evaluative statements about (features of) the new system
		Using the new system: Managing the new system as a user
		MACH: Evaluative statements about the old MACH system (system used in the UK before SAP)
		Everyday procedures: Changes to day-to-day procedures dues to the new system
		Flexibility: Responsiveness of the new system to desired system changes
Resistance and learning Characteristics of resistance during the change, and learning at different levels of analysis	**Resistance**	**Shock**: Strong emotional reactions to the change
		Uncertainty: Uncertainty and lack of knowledge about aspects of the change
		Anxiousness: Fear and worry about the change
		Expectations: Anticipations about the change once it was announced
		Change attitude: Resigned attitude about upcoming change
		Resistance: Emergences of resistance to change
	Learning	**Learning from resistance**: Using resistance or critical reactions as a source of learning
		Training: Comments on the execution and the quality of the training in the new system
		Experts: Development of experts (key users) and expertise in the new system
		Formalization of knowledge: Documentation and formalization of generated knowledge for work-related purposes
		Feedback: Feedback on the usability of the new system and improvement suggestions
		Individual learning: Accounts of learning at the indiv. level
		Group learning: Accounts of learning at the group level
		Learning lost: Individual level learning that was not fed forward into the organization
		Lessons learned: Lessons learned from the project
Communication Description of intra-organizational communication	**Communication**	**Communication within UK**: Descriptions of comm. within the subsidiary

APPENDIX G: COMPLETE INTERVIEW CODING FRAME

BASIC CODES	THEMATIC CODES (n=37)	MAIN COMMON THEMES			THEMATIC CATEGORIES
		UK managers	UK employees	GER managers	
DEMO-GRAPHICS AND JOB DE-SCRIPTION	**Job description** **Demographics** **Commitment**	▪ We're doing a good job at R&P in the UK			UK is doing fine
ORGANIZA-TIONAL RE-LATIONS	**System integration**	▪ This diminishes what we've had independently in the UK	▪ We've got some-body to fall back on now	▪ England has lost independence and their performance became more trans-parent	Decreased inde-pendence
	Germany vs. UK **Decision mak-ing**	▪ We do things differently in the UK		▪ Personal exchange is important because the UK has a more hierarchical business culture	Centralized or-ganization
		▪ Decisions are made in Germany, there is no discussion with us	▪ Decisions are made in Germany, there is no discussion with us	▪ The decision to go ahead with the pro-ject was largely made here	
THE PRO-JECT	**Concerns** **Prior imple-mentations** **Planning**	▪ Has this change been catered to our needs at all? ▪ There were prob-lems with prior implementations in other countries	▪ We though it wasn't going to work.	▪ The structure of the England project was based on experi-ences with earlier implementations ▪ Planning was based on earlier imple-mentations in other subsidiaries ▪ We could have done this project in a shorter time period	A change pre-scribed from headquarters
	Efficiency **Managing the transition** **Redundancies** **IT in the UK**	▪ The warehouse closure is a direct consequence of the SAP implementation ▪ Having to manage the warehouse clo-sure and the SAP implementation at the same time was a very big effort	▪ The transition meant a lot of extra work for us	▪ SAP and a central-ized distribution is an integral part of our strategy	A difficult project
		▪ We realized that a lot of people would be made redundant ▪ We tried to make the redundancies as comfortable as pos-sible	▪ The redundancies had a big impact on morale and people became very inse-cure		
		▪ The IT department in the UK has shrunk dramatically	▪ The IT department in the UK has shrunk dramatically	▪ The change made the IT department as it was obsolete	
	Evaluation of the change	▪ We all did a very good job ▪ Germany was satisfied ▪ The change project was an economic	▪ It was a struggle, but in the end it went well	▪ All numbers indicate it was a success, and it gave us confi-dence for further projects	Success imperа-tive

BASIC CODES	THEMATIC CODES (n=37)	MAIN COMMON THEMES			THEMATIC CATEGORIES
		UK managers	UK employees	GER managers	
	Outlook		▪ They will need less and less people in the future	▪ Our long-term strategy is to implement SAP in all national subsidiaries	Further layoffs?
THE NEW SYSTEM	**Quality** **Using the new system MACH** **Everyday procedures**	▪ The new system is an improvement, but it is monumental and complex ▪ There are things the new system doesn't do that we were told it would ▪ Our old MACH system was cumbersome and became outdated ▪ Everyday procedures have not changed dramatically with the new system	▪ SAP made my job a lot more efficient ▪ The new system was very difficult at first, but after a while we were okay with it ▪ Our old MACH system was cumbersome and became outdated ▪ Everyday procedures are much quicker now		Progress
	Flexibility	▪ We can't make even minor changes to the system, only Germany can do that	▪ We can't make even minor changes to the system, only Germany can do that	▪ The system is intended as a standardized worldwide solution, there is no room for special treatment	One size fits all
RESISTANCE	**Shock** **Uncertainty** **Anxiousness**	▪ When the news broke about the changes, that was a shock to everyone ▪ At the beginning our employees became very uncertain about their job safety ▪ Will I be able to manage and perform the new things?	▪ Especially the warehouse closure was a real shock ▪ It was frustrating to not know what was going to happen and people started wondering who was next to go ▪ We were nervous and worried whether we would manage to work wit the new system	▪ We clearly communicated to the UK management what was going to happen	Insecurity
	Expectations **Change attitude** **Resistance**	▪ We were generally looking to get a lot from the change ▪ We were resigned to the fact that it was going to happen and we had to make the best of it ▪ People reacted well to the change and remained cooperative ▪ I think it was more anxiousness than resistance	▪ The computers are going to take over ▪ Changes happen, you have to go with the flow ▪ We were probably more anxious than resistant	▪ They agreed that the change was a necessity and generally acted rationally ▪ They had rather emotional problems initially, but that passed quickly	Resistance is futile
LEARNING	**Learning from resistance**	▪ We sold SAP particularly well to our people	▪ It was described to us as the big new computer system that all big companies have now		Selling SAP
	Training **Experts**	▪ The first training in Germany was very bad and irrelevant to	▪ There was not enough training, and what we had was	▪ We used the 'train the trainer' principle, which we al-	Insufficient training

BASIC CODES	THEMATIC CODES (n=37)	MAIN COMMON THEMES			THEMATIC CATEGORIES
		UK managers	UK employees	GER managers	
		what we do here ▪ There was generally too little training ▪ Some people were meant to be key users	inadequate ▪ New people get informal on-the-job training ▪ Some people were meant to be key users, but they didn't have all the answers	ways found successful	
	Formalization of knowledge	▪ We had to write our own simple training manual ▪ There is no organized documentation for everyone	▪ You made your own notes, bits of paper in people's drawers basically	▪ There is no final project report ▪ We used prior training manuals and adapted them to the UK project	Random formalization
	Feedback	▪ I think the company should be much more responsive to the people going through the change	▪ We've not been encouraged to give feedback		Responsiveness to feedback
	Individual learning **Group learning**	▪ You learn by using the program	▪ You really learn not from the manuals but by using the system ▪ It is better to ask somebody than to fiddle around with it yourself ▪ The younger people cope much better and they're less nervous ▪ We'd just shout and all help each other. We talk a lot	▪ They seemed to help one another a lot with the new program	Learning by doing
	Learning lost **Lessons learned**	▪ When people leave, their knowledge is lost ▪ Being honest with people about the change is very important	▪ One lady left because of the change ▪ In future projects, they should communicate more and fully inform staff. Much more training is also needed	▪ Face-to-face interaction is crucial on such projects and strengthens the cohesiveness of the organization	Honesty, cohesiveness, and lost learning
COMMUNICATION	**Communication within UK** **Communication with headquarters**	▪ We tried to be open with people and kept our staff informed ▪ We traditionally haven't been very good as a company in passing on information ▪ Good communication is crucial in any change ▪ The German management didn't give us all the information we needed during the project	▪ We communicate a lot in sales and accounting ▪ UK management told us in a meeting that the change was going to happen ▪ We email specific questions to Germany or phone them and usually get responses	▪ The communication with the UK management was often difficult, and we probably should have had more	Changing through communication

APPENDIX H: FREQUENCIES OF THEMATIC CODES ACROSS INTERVIEWS

	Interviews																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Totals
Thematic codes																			
Anxiousness	0	2	2	11	5	6	1	0	4	0	4	1	1	11	7	0	3	1	59
Change attitude	1	1	2	5	1	1	2	3	2	1	3	1	4	5	3	2	3	5	45
Commitment	4	2	4	0	0	0	4	0	2	0	0	0	0	24	1	0	0	0	41
Communication with h	15	8	10	5	8	2	8	0	1	4	1	1	0	10	8	10	7	11	109
Communication within	0	4	3	4	6	4	1	0	4	2	1	3	0	11	3	1	2	0	49
Concerns about imple	4	1	6	3	2	2	0	2	0	3	0	0	1	4	5	4	0	2	39
Decision making	6	3	4	1	2	2	0	2	0	1	3	0	1	16	2	9	1	3	56
Demographics	1	2	1	1	1	1	1	1	2	2	3	1	5	2	2	4	3	3	36
Efficiency	5	2	2	0	0	0	0	2	1	0	3	0	2	2	0	2	1	0	22
Evaluation of the ch	2	6	5	4	5	1	1	5	4	3	3	1	5	8	9	6	6	1	75
Everyday procedures	2	2	0	1	1	9	3	2	1	2	1	1	0	0	7	1	5	2	40
Expectations	1	3	3	7	2	2	0	1	0	1	0	1	1	16	2	0	0	0	40
Experts within the o	2	2	0	6	2	2	2	0	2	0	1	0	1	0	3	1	2	0	26
Feedback	4	0	0	1	0	2	1	1	0	2	1	0	0	2	3	5	1	0	23
Flexibility	2	2	4	1	2	1	4	1	1	3	0	0	3	5	1	4	1	0	35
Formalization of kno	7	6	0	5	7	6	5	3	11	6	5	4	1	0	7	4	3	2	82
Germany vs. UK	12	9	2	2	3	1	2	7	0	0	0	0	6	8	0	14	4	5	75
Group learning	0	2	0	6	4	7	4	0	5	2	3	8	0	0	9	0	1	3	54
Inadequacy of the ol	2	3	1	5	1	6	2	0	2	0	4	1	0	0	4	0	4	2	37
Individual learning	3	0	0	4	7	2	2	0	5	1	2	1	0	0	2	0	3	1	33
IT in the UK	4	1	1	1	5	0	0	5	0	0	2	0	2	5	0	2	0	0	28
Job description	1	1	2	3	2	1	3	1	3	5	5	5	4	4	7	4	3	7	61
Learning from resist	1	7	0	0	0	0	0	1	0	0	2	0	0	6	1	0	1	0	19
Learning lost	1	0	0	0	1	0	0	1	0	0	0	0	0	10	1	0	0	0	14
Lessons learned	0	3	1	2	2	4	3	2	1	2	3	0	2	8	3	4	6	0	46
Managing the transit	1	3	2	5	3	6	1	2	0	4	4	0	2	6	4	1	2	4	50
Outlook	0	1	2	6	2	1	4	1	6	5	9	3	3	5	3	1	2	0	54
Planning the impleme	4	1	4	0	0	0	1	8	0	0	0	0	5	8	0	7	6	4	48
Prior implementation	1	1	3	0	1	0	0	5	0	0	0	0	4	7	0	4	1	5	32
Quality of the new s	7	8	0	8	2	8	7	0	3	1	6	6	2	1	9	1	6	1	76
Redundancies	3	7	3	7	4	1	0	1	0	1	2	0	0	11	3	2	1	2	48
Resistance	0	2	0	2	1	3	3	3	0	1	2	1	3	9	2	4	1	4	41
Shock	0	3	0	5	0	0	3	0	2	0	3	0	0	5	1	0	0	0	22
System integration w	10	4	6	4	4	4	8	4	2	5	1	1	6	8	2	2	6	2	79
Training	7	14	2	3	10	10	9	5	11	4	9	5	2	6	21	8	10	19	155
Uncertainty	2	3	1	0	4	3	2	2	0	0	0	0	1	12	2	1	2	2	37
Using the new system	1	1	0	6	1	4	1	0	6	3	4	3	0	0	4	0	5	5	44
Totals	116	120	76	124	101	102	88	71	81	64	90	48	67	235	141	108	102	96	1830

APPENDIX I: STATISTICAL ANALYSES FOR THE REPERTORY GRIDS

Group 1: UK employees (Farnsworth, Woolfe, Browning)
Group 2: UK employees (Naidoo, Winterstein)
Group 3: German managers (Berwanger, Becker)

Descriptive statistics of constructs

Group 1

	N	Mean	Std.	Skewness	
	Statistic	Statistic	Statistic	Statistic	Std. Error
single-collective	8	3.88	1.959	.230	.752
no impact-impact	8	3.63	2.200	.421	.752
pessimistic-optimistic	8	3.87	2.031	.224	.752
low desperation-high desperation	8	4.38	1.996	-.690	.752
irrational-rational	8	3.38	2.134	.877	.752
destructive-constructive	8	3.63	2.066	.541	.752
subtle-overt	8	4.13	2.031	-.224	.752
not directed at management-directed at management	8	4.00	2.000	.000	.752
not affecting output rate-affecting output rate	8	3.75	2.315	.035	.752
Valid N (listwise)	8				

Group 2

	N	Mean	Std.	Skewness	
	Statistic	Statistic	Statistic	Statistic	Std. Error
verbal-action	9	4.0000	1.87083	.000	.717
individual-collective	9	3.3333	2.12132	.651	.717
negatively affecting output-not affecting output	9	4.2222	1.98606	-.269	.717
active-passive	9	3.6667	2.00000	.469	.717
directed at management-not directed at management	9	3.7778	1.98606	.269	.717
emotional-rational	9	3.7778	2.10819	-.038	.717
cost to the company-no cost to the company	9	3.7778	2.04803	.720	.717
covert-overt	9	4.2222	1.92209	-.403	.717
constructive-destructive	9	4.8889	1.90029	-.922	.717
Valid N (listwise)	9				

Group 3

	N	Mean	Std.	Skewness	
	Statistic	Statistic	Statistic	Statistic	Std. Error
passive - active	8	4.38	2.066	-.541	.752
not solution-oriented - solution-oriented	8	3.63	2.264	.226	.752
not communicative - communicative	8	3.88	2.232	.207	.752
damage to the company - no damage to the company	8	4.00	1.927	-.160	.752
hidden - open	8	4.00	2.000	.000	.752
alone - collective	8	3.75	1.982	.459	.752
repressing the change - openly tackling the change	8	4.13	1.885	-.067	.752
destructive - constructive	8	3.75	2.188	.096	.752
Valid N (listwise)	8				

Correlation tables for constructs

Group 1

		single-collective	no impact-impact	pessimistic-optimistic	low desperation-high desperation	irrational-rational	destructive-constructive	subtle-overt	not directed at management-directed at management	not affecting output rate-affecting output rate
single-collective	Pearson Correlation	1	-.543	.426	-.936**	.833*	.798*	-.713*	-.766*	-.543
	Sig. (2-tailed)	.	.165	.292	.001	.010	.017	.047	.027	.164
	N	8	8	8	8	8	8	8	8	8
no impact-impact	Pearson Correlation	-.543	1	.340	.557	-.209	-.193	.651	.779*	-.021
	Sig. (2-tailed)	.165	.	.410	.151	.619	.648	.080	.023	.961
	N	8	8	8	8	8	8	8	8	8
pessimistic-optimistic	Pearson Correlation	.426	.340	1	-.515	.738*	.736*	-.100	-.106	-.798*
	Sig. (2-tailed)	.292	.410	.	.191	.037	.037	.815	.804	.018
	N	8	8	8	8	8	8	8	8	8
low desperation-high desperation	Pearson Correlation	-.936**	.557	-.515	1	-.876**	-.827*	.762*	.680	.673
	Sig. (2-tailed)	.001	.151	.191	.	.004	.011	.028	.063	.068
	N	8	8	8	8	8	8	8	8	8
irrational-rational	Pearson Correlation	.833*	-.209	.738*	-.876**	1	.911**	-.639	-.536	-.701
	Sig. (2-tailed)	.010	.619	.037	.004	.	.002	.088	.171	.053
	N	8	8	8	8	8	8	8	8	8
destructive-constructive	Pearson Correlation	.798*	-.193	.736*	-.827*	.911**	1	-.396	-.588	-.829*
	Sig. (2-tailed)	.017	.648	.037	.011	.002	.	.332	.125	.011
	N	8	8	8	8	8	8	8	8	8
subtle-overt	Pearson Correlation	-.713*	.651	-.100	.762*	-.639	-.396	1	.528	.251
	Sig. (2-tailed)	.047	.080	.815	.028	.088	.332	.	.179	.549
	N	8	8	8	8	8	8	8	8	8
not directed at management-directed at management	Pearson Correlation	-.766*	.779*	-.106	.680	-.536	-.588	.528	1	.247
	Sig. (2-tailed)	.027	.023	.804	.063	.171	.125	.179	.	.556
	N	8	8	8	8	8	8	8	8	8
not affecting output rate-affecting output rate	Pearson Correlation	-.543	-.021	-.798*	.673	-.701	-.829*	.251	.247	1
	Sig. (2-tailed)	.164	.961	.018	.068	.053	.011	.549	.556	.
	N	8	8	8	8	8	8	8	8	8

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Group 2

		verbal-action	individual-collective	negatively affecting output-not affecting output	active-passive	directed at management-not directed at management	emotional-rational	cost to the company-no cost to the company	covert-overt	constructive-destructive
verbal-action	Pearson Correlation	1	-.756*	-.774*	-.535	-.269	.317	-.685*	-.417	.703*

[redacted]

.892**	-.583	.743*	-.011	-.175
.001	.099	.022	.978	.652
9	9	9	9	9
1	-.670*	.601	-.182	.158
.	.048	.087	.639	.684
9	9	9	9	9
-.670*	1	-.244	.291	-.350
.048	.	.526	.447	.356
9	9	9	9	9
.601	-.244	1	.141	-.553

active-passive	Pearson Correlation	-.535	-.029	.745*	1
	Sig. (2-tailed)	.138	.940	.021	.
	N	9	9	9	9
directed at management-not directed at management	Pearson Correlation	-.269	-.188	.489	.892**
	Sig. (2-tailed)	.484	.628	.181	.001
	N	9	9	9	9
emotional-rational	Pearson Correlation	.317	.186	-.166	-.583
	Sig. (2-tailed)	.406	.631	.670	.099
	N	9	9	9	9
cost to the company-no cost to the company	Pearson Correlation	-.685*	.422	.905**	.743*
	Sig. (2-tailed)	.042	.258	.001	.022

Group 3

		passive - active	not solution-oriented - solution-oriented	not communicative - communicative	damage to the company - no damage to the company	hidden - open	alone - collective	repressing the change - openly tackling the change	destructive - constructive
passive - active	Pearson Correlation	1	.279	.352	.359	.277	.515	.793*	.751*
	Sig. (2-tailed)	.	.504	.392	.383	.507	.192	.019	.032
	N	8	8	8	8	8	8	8	8
not solution-oriented - solution-oriented	Pearson Correlation	.279	1	.866**	.884**	-.316	.708*	.749*	.671
	Sig. (2-tailed)	.504	.	.005	.004	.446	.049	.032	.069
	N	8	8	8	8	8	8	8	8
not communicative - communicative	Pearson Correlation	.352	.866**	1	.830*	-.096	.735*	.751*	.607
	Sig. (2-tailed)	.392	.005	.	.011	.821	.038	.032	.110
	N	8	8	8	8	8	8	8	8
damage to the company - no damage to the company	Pearson Correlation	.359	.884**	.830*	1	.037	.673	.668	.779*
	Sig. (2-tailed)	.383	.004	.011	.	.931	.067	.070	.023
	N	8	8	8	8	8	8	8	8
hidden - open	Pearson Correlation	.277	-.316	-.096	.037	1	.000	-.076	.229
	Sig. (2-tailed)	.507	.446	.821	.931	.	1.000	.858	.586
	N	8	8	8	8	8	8	8	8
alone - collective	Pearson Correlation	.515	.708*	.735*	.673	.000	1	.698	.577
	Sig. (2-tailed)	.192	.049	.038	.067	1.000	.	.054	.135
	N	8	8	8	8	8	8	8	8
repressing the change - openly tackling the change	Pearson Correlation	.793*	.749*	.751*	.668	-.076	.698	1	.771*
	Sig. (2-tailed)	.019	.032	.032	.070	.858	.054	.	.025
	N	8	8	8	8	8	8	8	8
destructive - constructive	Pearson Correlation	.751*	.671	.607	.779*	.229	.577	.771*	1
	Sig. (2-tailed)	.032	.069	.110	.023	.586	.135	.025	.
	N	8	8	8	8	8	8	8	8

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation tables for elements

Group 1

		Discussions with colleagues	Discussions with managers	Threats to leave	Bad feelings	Leaving the company	Decrease performance level	Tears, frustration	Aggression
Discussions with colleagues	Pearson Correlation	1	.901**	-.679*	-.035	-.925**	-.674*	-.079	-.442
	Sig. (2-tailed)	.	.001	.044	.929	.000	.047	.839	.233
	N	9	9	9	9	9	9	9	9
Discussions with managers	Pearson Correlation	.901**	1	-.492	-.248	-.817**	-.855**	-.299	-.354
	Sig. (2-tailed)	.001	.	.179	.519	.007	.003	.435	.350
	N	9	9	9	9	9	9	9	9
Threats to leave	Pearson Correlation	-.679*	-.492	1	-.378	.865**	.155	-.314	.647
	Sig. (2-tailed)	.044	.179	.	.315	.003	.691	.411	.060
	N	9	9	9	9	9	9	9	9
Bad feelings	Pearson Correlation	-.035	-.248	-.378	1	-.210	.481	.060	-.520
	Sig. (2-tailed)	.929	.519	.315	.	.587	.190	.878	.151
	N	9	9	9	9	9	9	9	9
Leaving the company	Pearson Correlation	-.925**	-.817**	.865**	-.210	1	.478	-.065	.585
	Sig. (2-tailed)	.000	.007	.003	.587	.	.194	.867	.098
	N	9	9	9	9	9	9	9	9
Decrease performance level	Pearson Correlation	-.674*	-.855**	.155	.481	.478	1	.453	.104
	Sig. (2-tailed)	.047	.003	.691	.190	.194	.	.220	.790
	N	9	9	9	9	9	9	9	9
Tears, frustration	Pearson Correlation	-.079	-.299	-.314	.060	-.065	.453	1	.007
	Sig. (2-tailed)	.839	.435	.411	.878	.867	.220	.	.986
	N	9	9	9	9	9	9	9	9
Aggression	Pearson Correlation	-.442	-.354	.647	-.520	.585	.104	.007	1
	Sig. (2-tailed)	.233	.350	.060	.151	.098	.790	.986	.
	N	9	9	9	9	9	9	9	9

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Group 2

		Hiding parts of work, becoming secretive	High stress	Negative speculation	Indifference	Decreased performance	Gossip	Discussion with management	Leave the company	Anger, frustration
Hiding parts of work, becoming secretive	Pearson Correlation	1	.310	-.122	-.108	.726*	-.691*	-.482	.608	-.136
	Sig. (2-tailed)	.	.417	.755	.783	.027	.039	.189	.082	.727
	N	9	9	9	9	9	9	9	9	9
High stress	Pearson Correlation	.310	1	-.280	.494	.016	-.066	-.822**	-.007	.685*
	Sig. (2-tailed)	.417	.	.466	.177	.967	.866	.007	.986	.042
	N	9	9	9	9	9	9	9	9	9
Negative speculation	Pearson Correlation	-.122	-.280	1	-.122	-.189	.135	.496	.177	.243
	Sig. (2-tailed)	.755	.466	.	.755	.626	.730	.175	.648	.529
	N	9	9	9	9	9	9	9	9	9
Indifference	Pearson Correlation	-.108	.494	-.122	1	-.639	.266	-.296	-.616	.183
	Sig. (2-tailed)	.783	.177	.755	.	.064	.489	.440	.077	.637
	N	9	9	9	9	9	9	9	9	9
Decreased performance	Pearson Correlation	.726*	.016	-.189	-.639	1	-.636	-.300	.727*	-.269
	Sig. (2-tailed)	.027	.967	.626	.064	.	.066	.432	.026	.485
	N	9	9	9	9	9	9	9	9	9
Gossip	Pearson Correlation	-.691*	-.066	.135	.266	-.636	1	.204	-.775*	.327
	Sig. (2-tailed)	.039	.866	.730	.489	.066	.	.598	.014	.390
	N	9	9	9	9	9	9	9	9	9
Discussion with management	Pearson Correlation	-.482	-.822**	.496	-.296	-.300	.204	1	-.068	-.350
	Sig. (2-tailed)	.189	.007	.175	.440	.432	.598	.	.863	.356
	N	9	9	9	9	9	9	9	9	9
Leave the company	Pearson Correlation	.608	-.007	.177	-.616	.727*	-.775*	-.068	1	-.012
	Sig. (2-tailed)	.082	.986	.648	.077	.026	.014	.863	.	.975
	N	9	9	9	9	9	9	9	9	9
Anger, frustration	Pearson Correlation	-.136	.685*	.243	.183	-.269	.327	-.350	-.012	1
	Sig. (2-tailed)	.727	.042	.529	.637	.485	.390	.356	.975	.

Factor analysis results

Syntax (generic syntax excluding specific variables for the respective groups)

```
FACTOR
 /VARIABLES {all variables} /MISSING LISTWISE /ANALYSIS {all variables}
 /PRINT INITIAL EXTRACTION
 /PLOT ROTATION
 /CRITERIA MINEIGEN(1) ITERATE(25)
 /EXTRACTION PC
 /ROTATION NOROTATE
 /METHOD=COVARIANCE .
```

Group 1 by constructs

Communalities

	Raw		Rescaled	
	Initial	Extraction	Initial	Extraction
single-collective	3.839	3.466	1.000	.903
no impact-impact	4.839	4.498	1.000	.930
pessimistic-optimistic	4.125	3.797	1.000	.921
low desperation-high desperation	3.982	3.808	1.000	.956
irrational-rational	4.554	4.148	1.000	.911
destructive-constructive	4.268	3.927	1.000	.920
subtle-overt	4.125	2.888	1.000	.700
not directed at management-directed at management	4.000	3.081	1.000	.770
not affecting output rate-affecting output rate	5.357	4.479	1.000	.836

Extraction Method: Principal Component Analysis.

Total Variance Explained

		Initial Eigenvalues[a]			Extraction Sums of Squared Loadings		
	Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	24.282	62.119	62.119	24.282	62.119	62.119
	2	9.810	25.096	87.215	9.810	25.096	87.215
	3	2.295	5.872	93.086			
	4	1.483	3.793	96.879			
	5	.536	1.372	98.251			
	6	.419	1.071	99.322			
	7	.265	.678	100.000			
	8	-6.71E-17	-1.716E-16	100.000			
	9	-9.73E-16	-2.490E-15	100.000			
Rescaled	1	24.282	62.119	62.119	5.670	62.999	62.999
	2	9.810	25.096	87.215	2.177	24.184	87.183
	3	2.295	5.872	93.086			
	4	1.483	3.793	96.879			
	5	.536	1.372	98.251			
	6	.419	1.071	99.322			
	7	.265	.678	100.000			
	8	-6.71E-17	-1.716E-16	100.000			
	9	-9.73E-16	-2.490E-15	100.000			

Extraction Method: Principal Component Analysis.

a. When analyzing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution.

Component Matrix[a]

	Raw		Rescaled	
	Component		Component	
	1	2	1	2
single-collective	-1.820	-.390	-.929	-.199
no impact-impact	1.002	1.869	.455	.850
pessimistic-optimistic	-1.268	1.480	-.624	.729
low desperation-high desperation	1.936	.247	.970	.124
irrational-rational	-1.997	.402	-.936	.188
destructive-constructive	-1.898	.571	-.919	.276
subtle-overt	1.407	.953	.693	.469
not directed at management-directed at management	1.423	1.027	.712	.514
not affecting output rate-affecting output rate	1.737	-1.209	.750	-.522

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Group 1 by elements

Communalities

	Raw		Rescaled	
	Initial	Extraction	Initial	Extraction
Discussions with colleagues	6.028	5.702	1.000	.946
Discussions with managers	6.000	5.877	1.000	.979
Threats to leave	3.361	3.061	1.000	.911
Bad feelings	1.694	.971	1.000	.573
Leaving the company	6.444	6.367	1.000	.988
Decrease performance level	4.444	4.165	1.000	.937
Tears, frustration	2.028	.775	1.000	.382
Aggression	1.944	1.005	1.000	.517

Extraction Method: Principal Component Analysis.

Total Variance Explained

		Initial Eigenvalues[a]			Extraction Sums of Squared Loadings		
	Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	21.492	67.280	67.280	21.492	67.280	67.280
	2	6.431	20.132	87.412	6.431	20.132	87.412
	3	2.107	6.597	94.009			
	4	.831	2.602	96.611			
	5	.472	1.478	98.089			
	6	.349	1.091	99.180			
	7	.262	.820	100.000			
	8	1.990E-06	6.229E-06	100.000			
Rescaled	1	21.492	67.280	67.280	4.067	50.832	50.832
	2	6.431	20.132	87.412	2.167	27.088	77.920
	3	2.107	6.597	94.009			
	4	.831	2.602	96.611			
	5	.472	1.478	98.089			
	6	.349	1.091	99.180			
	7	.262	.820	100.000			
	8	1.990E-06	6.229E-06	100.000			

Extraction Method: Principal Component Analysis.

a. When analyzing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution.

Component Matrix[a]

	Raw		Rescaled	
	Component		Component	
	1	2	1	2
Discussions with colleagues	-2.388	.023	-.973	.009
Discussions with managers	-2.318	-.711	-.946	-.290
Threats to leave	1.325	-1.142	.723	-.623
Bad feelings	.030	.985	.023	.757
Leaving the company	2.406	-.761	.948	-.300
Decrease performance level	1.525	1.356	.724	.643
Tears, frustration	.180	.862	.127	.605
Aggression	.717	-.700	.515	-.502

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Group 2 by constructs

Communalities

	Raw		Rescaled	
	Initial	Extraction	Initial	Extraction
verbal-action	3.500	2.918	1.000	.834
individual-collective	4.500	3.418	1.000	.760
negatively affecting output-not affecting output	3.944	3.566	1.000	.904
active-passive	4.000	3.686	1.000	.922
directed at management-not directed at management	3.944	3.522	1.000	.893
emotional-rational	4.444	3.006	1.000	.676
cost to the company-no cost to the company	4.194	3.544	1.000	.845
covert-overt	3.694	1.926	1.000	.521
constructive-destructive	3.611	3.215	1.000	.890

Extraction Method: Principal Component Analysis.

Total Variance Explained

		Initial Eigenvalues[a]			Extraction Sums of Squared Loadings		
	Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	17.443	48.678	48.678	17.443	48.678	48.678
	2	11.357	31.693	80.372	11.357	31.693	80.372
	3	3.067	8.558	88.930			
	4	2.214	6.178	95.108			
	5	1.107	3.090	98.197			
	6	.458	1.278	99.475			
	7	.168	.468	99.943			
	8	.020	.057	100.000			
	9	1.250E-16	3.489E-16	100.000			
Rescaled	1	17.443	48.678	48.678	4.440	49.332	49.332
	2	11.357	31.693	80.372	2.804	31.161	80.493
	3	3.067	8.558	88.930			
	4	2.214	6.178	95.108			
	5	1.107	3.090	98.197			
	6	.458	1.278	99.475			
	7	.168	.468	99.943			
	8	.020	.057	100.000			
	9	1.250E-16	3.489E-16	100.000			

Extraction Method: Principal Component Analysis.

a. When analyzing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution.

Component Matrix[a]

	Raw		Rescaled	
	Component		Component	
	1	2	1	2
verbal-action	-1.662	.395	-.888	.211
individual-collective	1.180	-1.423	.556	-.671
negatively affecting output-not affecting output	1.887	-.074	.950	-.037
active-passive	1.553	1.128	.777	.564
directed at management-not directed at management	1.118	1.508	.563	.759
emotional-rational	-.671	-1.599	-.318	-.758
cost to the company-no cost to the company	1.870	.213	.913	.104
covert-overt	.684	-1.207	.356	-.628
constructive-destructive	-1.284	1.252	-.676	.659

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Group 2 by elements

Communalities

	Raw		Rescaled	
	Initial	Extraction	Initial	Extraction
Hiding parts of work, becoming secretive	3.611	2.657	1.000	.736
High stress	4.611	4.157	1.000	.902
Negative speculation	.361	.056	1.000	.155
Indifference	3.611	2.427	1.000	.672
Decreased performance	2.528	1.921	1.000	.760
Gossip	4.250	3.174	1.000	.747
Discussion with management	6.111	5.507	1.000	.901
Leave the company	7.500	6.812	1.000	.908
Anger, frustration	1.528	.440	1.000	.288

Extraction Method: Principal Component Analysis.

Total Variance Explained

		Initial Eigenvalues[a]			Extraction Sums of Squared Loadings		
	Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	15.624	45.803	45.803	15.624	45.803	45.803
	2	11.528	33.795	79.598	11.528	33.795	79.598
	3	2.918	8.554	88.153			
	4	2.271	6.657	94.810			
	5	1.039	3.046	97.855			
	6	.391	1.147	99.002			
	7	.196	.576	99.578			
	8	.144	.422	100.000			
	9	2.968E-15	8.701E-15	100.000			
Rescaled	1	15.624	45.803	45.803	3.423	38.034	38.034
	2	11.528	33.795	79.598	2.646	29.401	67.435
	3	2.918	8.554	88.153			
	4	2.271	6.657	94.810			
	5	1.039	3.046	97.855			
	6	.391	1.147	99.002			
	7	.196	.576	99.578			
	8	.144	.422	100.000			
	9	2.968E-15	8.701E-15	100.000			

Extraction Method: Principal Component Analysis.

a. When analyzing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution.

Component Matrix[a]

	Raw		Rescaled	
	Component		Component	
	1	2	1	2
Hiding parts of work, becoming secretive	1.557	.483	.819	.254
High stress	.388	2.002	.181	.932
Negative speculation	-.047	-.232	-.078	-.386
Indifference	-.933	1.248	-.491	.657
Decreased performance	1.376	-.165	.865	-.104
Gossip	-1.776	.144	-.861	.070
Discussion with management	-.890	-2.171	-.360	-.878
Leave the company	2.515	-.697	.918	-.255
Anger, frustration	-.111	.654	-.090	.529

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Group 3 by constructs

Communalities

	Raw		Rescaled	
	Initial	Extraction	Initial	Extraction
passive - active	4.268	3.443	1.000	.807
not solution-oriented - solution-oriented	5.125	4.943	1.000	.964
not communicative - communicative	4.982	4.235	1.000	.850
damage to the company - no damage to the company	3.714	3.023	1.000	.814
hidden - open	4.000	2.731	1.000	.683
alone - collective	3.929	2.660	1.000	.677
repressing the change - openly tackling the change	3.554	2.953	1.000	.831
destructive - constructive	4.786	4.134	1.000	.864

Extraction Method: Principal Component Analysis.

Total Variance Explained

		Initial Eigenvalues[a]			Extraction Sums of Squared Loadings		
	Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	21.886	63.701	63.701	21.886	63.701	63.701
	2	6.237	18.153	81.853	6.237	18.153	81.853
	3	2.955	8.602	90.455			
	4	1.802	5.245	95.701			
	5	.961	2.797	98.497			
	6	.291	.847	99.344			
	7	.225	.656	100.000			
	8	-1.03E-15	-3.003E-15	100.000			
Rescaled	1	21.886	63.701	63.701	5.040	62.996	62.996
	2	6.237	18.153	81.853	1.450	18.128	81.124
	3	2.955	8.602	90.455			
	4	1.802	5.245	95.701			
	5	.961	2.797	98.497			
	6	.291	.847	99.344			
	7	.225	.656	100.000			
	8	-1.03E-15	-3.003E-15	100.000			

Extraction Method: Principal Component Analysis.

a. When analyzing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution.

Component Matrix[a]

	Raw		Rescaled	
	Component		Component	
	1	2	1	2
passive - active	1.327	1.297	.643	.628
not solution-oriented - solution-oriented	2.028	-.912	.896	-.403
not communicative - communicative	1.980	-.560	.887	-.251
damage to the company - no damage to the company	1.723	-.231	.894	-.120
hidden - open	-.033	1.652	-.016	.826
alone - collective	1.630	-.060	.822	-.030
repressing the change - openly tackling the change	1.706	.206	.905	.109
destructive - constructive	1.885	.762	.862	.348

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Group 3 by elements

Communalities

	Raw		Rescaled	
	Initial	Extraction	Initial	Extraction
Deliberate gossip	.982	.041	1.000	.042
Discussions with colleagues	.786	.507	1.000	.646
Undermining of daily business	1.554	.984	1.000	.634
Threats to leave	.286	.019	1.000	.067
Discussion with management	1.839	.863	1.000	.469
Calling in sick	2.982	2.808	1.000	.942
Demotivation	1.411	.983	1.000	.697
Leaving the company	5.554	5.395	1.000	.971

Extraction Method: Principal Component Analysis.

Total Variance Explained

		Initial Eigenvalues[a]			Extraction Sums of Squared Loadings		
	Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	8.116	52.724	52.724	8.116	52.724	52.724
	2	3.485	22.639	75.363	3.485	22.639	75.363
	3	1.908	12.395	87.758			
	4	1.059	6.882	94.640			
	5	.461	2.994	97.634			
	6	.346	2.250	99.884			
	7	.018	.116	100.000			
	8	-4.12E-16	-2.675E-15	100.000			
Rescaled	1	8.116	52.724	52.724	2.710	33.870	33.870
	2	3.485	22.639	75.363	1.757	21.961	55.831
	3	1.908	12.395	87.758			
	4	1.059	6.882	94.640			
	5	.461	2.994	97.634			
	6	.346	2.250	99.884			
	7	.018	.116	100.000			
	8	-4.12E-16	-2.675E-15	100.000			

Extraction Method: Principal Component Analysis.

a. When analyzing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution.

Component Matrix[a]

	Raw		Rescaled	
	Component		Component	
	1	2	1	2
Deliberate gossip	.025	-.200	.025	-.202
Discussions with colleagues	.541	.463	.611	.522
Undermining of daily business	.039	.991	.032	.795
Threats to leave	.042	.131	.079	.246
Discussion with management	.832	.413	.613	.305
Calling in sick	-1.220	-1.149	-.706	-.665
Demotivation	.910	-.393	.766	-.331
Leaving the company	-2.193	.765	-.931	.325

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

APPENDIX J: TOP-DOWN DOCUMENT CODING FRAME

TOPIC AREAS	BASIC CODES	THEMATIC CODES (n = 30)
Description of the change	**Organizational relations**	**System integration**: Interconnectivity and integration of the subsidiary into the company system
		Germany vs. UK: The relationship between the subsidiary and headquarters
		Decision making: Decision making about and within the project
	The project	**Planning**: Descriptions of the planning of the change
		Efficiency: Linking the two parts of the change (SAP implementation and warehouse closure), general efficiency gains
		IT in the UK: Effects of the change on the IT department in the UK
		Evaluation of change: Evaluative statements in retrospect
		Warehouse closure: Issues related to the warehouse closure
	The new system	**Quality**: Evaluative statements about (features of) the new system
		MACH: Evaluative statements about the old MACH system (system used in the UK before SAP)
		SAP specifications: Specifications and configurations of SAP
Resistance and learning		**Resistance**
		Learning: Using resistance as a source of learning
		Training: Comments on the user training in the new system
		Formalization of knowledge: Formalization/documentation of knowledge in the project
Communication		**Communication with headquarters**: Communication between the UK subsidiary and German headquarters (both directions)
		Title/Purpose: Title and/or purpose of document
		Date of production: Date on which the document was created
		Date of delivery: Date until which a given task should be completed
		Sender: Sender or producer of document
		Recipient: Recipient of document
		Task responsibility: Person to whom given task is assigned (includes to-do lists)
Document specification		**Product issues**: Issues related to specific products or product ranges
		Product returns: Product returns from customers
		Pricing issues: Issues related to the pricing of products
		Accounting issues: Issues related to accounting
Products		**Shipment and delivery**: Shipment and delivery planning and procedures
		Hotel customers: Specifications related to hotel customers
		Concession shop/Wholesale customers: Specifications related to concession shop/wholesale customers
Customers		**Household customers**: Specifications related to household customers

APPENDIX K: COMPLETE DOCUMENT CODING FRAME

BASIC CODES	THEMATIC CODES (n=30)	MAIN COMMON THEMES	THEMATIC CATEGORIES
ORGANIZATIONAL RELATIONS	**System integration** **Germany vs. UK** **Decision making**	▪ Conceptual aspects of embedding the operations of the UK subsidiary in the company-wide system architecture ▪ Provision of support from Germany for SAP implementation ▪ Recommendation of SAP implementation and centralized distribution	The normative power of the factual
THE PROJECT	**Planning** **Efficiency** **IT in the UK** **Evaluation of change** **Warehouse closure**	▪ Organization of planning logistics (meetings when, where, to-do lists etc.) ▪ The centralized distribution and unified IT-architecture will greatly improve efficiency ▪ Status quo of the IT system in the UK ▪ The implementation steps were completed satisfactorily ▪ Logistical aspects of closing the UK warehouse	Procedure according to plan Operational project management
THE NEW SYSTEM	**Quality** **MACH** SAP **implementation**	▪ The new system will bring many immediate improvements ▪ MACH is technically inadequate ▪ Technical aspects of the SAP implementa-	Progress Operational project
	SAP specifications	▪ Configurations for the SAP system (user interface, entry codes, standard procedures etc.)	
RESISTANCE			
LEARNING	**Learning from resistance** **Training** **Formalization of knowledge**	▪ SAP is an exciting new system that will lead to immediate improvements ▪ Planning and logistical aspects of training execution ▪ Paper trail and documentation of project steps and decisions taken	Selling SAP Operational project management
COMMUNICATION	**Communication with headquarters**	▪ The company units will have to communicate about certain issues	Operational project management
DOCUMENT SPECIFICATION	**Title/Purpose** **Date of production** **Date of delivery** **Sender** **Recipient** **Task responsibility**	▪ Title and purpose of documents (meeting minutes, status report etc.) ▪ Date of production ▪ Date of delivery of a given identified task ▪ Sender of the document ▪ Recipient of the document ▪ Person responsible for a given identified task	Operational project management
PRODUCTS	**Product issues** **Product returns** **Pricing issues** **Accounting issues** **Shipment and delivery**	▪ Specifications about certain products or product ranges ▪ Logistical aspects of returning unwanted products from customers back to the warehouse ▪ Aspects of pricing for products and services in the new system ▪ Aspects of accounting procedures in the new system ▪ Logistics and specifications about the shipment and delivery of products from the central warehouse to customers	Operational project management
CUSTOMERS	**Hotel customers** **Concession shop/wholesale customers** **Household customers**	▪ Specific requirements of hotel customers ▪ Specific requirements of concession shops and wholesale customers ▪ Specific requirements of household customers	Operational project management

APPENDIX L: FREQUENCIES OF THEMATIC CODES ACROSS DOCUMENTS

	Documents																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Totals
Thematic codes																													
Accounting issues	0	10	11	6	4	2	2	1	1	2	0	2	0	0	1	0	1	0	4	1	6	3	1	2	0	0	0	0	60
Communication with h	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Concession shop /whol	1	8	3	1	1	1	0	3	0	0	0	2	0	0	1	0	0	0	3	0	0	0	6	1	1	0	0	0	32
Date of delivery	0	15	11	8	6	12	6	2	0	1	4	32	4	0	20	0	0	0	0	0	4	0	2	0	0	4	0	0	131
Date of production	1	1	2	2	2	2	2	2	1	0	1	1	1	1	2	0	1	0	0	0	7	0	1	1	1	2	0	0	34
Decision making	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
Efficiency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9
Evaluation of the ch	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	6
Formalization of kno	0	0	2	0	0	2	0	1	0	0	0	1	0	0	2	0	0	14	0	0	0	42	0	0	2	0	0	0	66
Germany vs . UK	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Hotel customers	0	5	3	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	1	0	0	0	19
Household customers	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	0	0	0	9
MACH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
IT in the UK	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4
Learning from resist	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Planning the impleme	0	3	19	0	2	1	2	2	7	0	3	0	0	0	0	0	1	0	0	0	4	0	0	0	0	0	3	0	47
Pricing issues	0	4	4	6	2	2	2	0	0	1	0	1	0	0	0	0	0	0	3	0	4	0	3	0	1	0	0	0	33
Product issues	0	5	9	2	0	1	0	1	3	0	0	2	0	0	0	0	0	0	0	0	2	2	1	0	1	0	0	0	29
Product returns	1	8	7	3	0	3	0	1	1	0	0	1	0	0	4	0	0	0	0	4	1	0	1	0	1	0	0	0	36
Quality of the new s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4
Recipient	1	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
SAP implementation p	0	6	3	12	2	12	0	2	3	6	5	4	2	0	0	0	4	0	0	0	7	1	4	4	3	2	2	0	84
SAP specifications	0	4	4	7	5	7	5	0	1	1	0	1	0	0	2	0	0	14	5	0	4	42	0	0	0	3	0	0	105
Sender	1	1	2	2	2	2	2	1	2	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	19
Shipment and deliver	9	10	8	3	6	1	2	2	1	0	0	5	0	0	2	0	0	0	4	2	2	10	2	2	0	5	0	1	77
System integration w	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	9
Task responsibility	0	26	39	25	11	22	9	18	14	21	5	22	2	0	11	0	0	0	0	0	0	0	5	0	4	0	0	0	234
Title /purpose	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	5	1	1	1	4	1	1	34
Training	0	2	3	1	3	3	0	2	1	1	2	1	1	0	2	1	1	0	0	0	1	0	1	0	2	0	0	0	28
Warehouse closure	0	2	3	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5	0	1	14
Totals	15	118	137	80	51	76	38	43	36	34	21	77	12	3	50	2	9	28	20	8	43	105	38	13	19	50	8	9	1143