

**Working Alone Together: Team Identification and Knowledge Sharing by Teachers**

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## **Abstract**

*In this study we test the effect of several team features on knowledge sharing within teams of primary school teachers and the performance of these teams. We contend that trust in team leaders and trust in colleagues, mediated by team identification, will have a positive effect on knowledge sharing and through knowledge sharing on team performance. Team value diversity, on the contrary, can have a negative effect on both knowledge sharing and team performance. We therefore explore a moderator effect of team identification on the relation between team value diversity and knowledge sharing. We hypothesize that if team identification is low, team value diversity will have a negative effect on knowledge sharing and team performance, while if team identification is high, value diversity will not constrain knowledge sharing and team performance.*

## **Introduction**

Teams are important in the process of knowledge creation, while knowledge creation, in turn, is seen as important for team performance. Several authors have conceptualized the process of exchanging and combining knowledge as a group level phenomenon, given its embeddedness in social relations (Nahapiet & Ghoshal, 1998; Edmondson, 2002). In this study we follow this conceptualization by conducting a group level analysis of antecedents and performance consequences of knowledge sharing in teams of primary school teachers. The antecedents studied are trust in team leaders, trust in colleagues, team identification and team value diversity.

For the study of knowledge sharing and performance of teams, teachers are an interesting group, because teams of teachers can vary widely regarding the degree in which they share knowledge. Teachers can be typified as working ‘alone together’. They are responsible for the cognitive and social progress of their pupils and as long as the results are satisfying for the parents or school board, there may be very little interaction with or interference from others. As a consequence, teams of teachers may operate as a collection of professionals who operate autonomously within their own classroom, with very low levels of knowledge sharing. Common responsibilities at the school level maybe restricted to a few activities such as organizing social events and contacts with parents. On the other end of the continuum, teachers may see

themselves as part of a team, in which members help each other to continuously improve their individual and the team's performance. They may actively engage in knowledge sharing practices such as exchanging best practices, discussing progress of pupils, exchanging problems they encounter in their teaching, developing teaching materials as a team, keeping up with new developments in the field and evaluating available teaching methods. We expect these teams to perform better. Given the wide variety in knowledge sharing possible, and the differences in school performances as for instance documented by the Education inspectorate, it can be expected that if the positive effect of knowledge sharing on team performance, as proposed by several authors (Nonaka & Takeuchi, 1995; Boisot, 1995; Zellmer-Bruhn & Gibson, 2006), is valid, it will materialize in a sample of these teams of teachers.

In this study we address four matters in need of clarification. A first matter is the relation between feelings of belongingness to the group and knowledge sharing behaviors. Since we conceptualize knowledge sharing as a group level behavior, which is embedded in social relations, an underlying assumption is that the nature of the social relations within the team will make a difference to knowledge sharing. We expect that in teams where members highly identify with the team, they are more inclined to share their knowledge than in teams with low team identification (Van der Vegt & Bunderson, 2005). By identifying with their team, members can be expected to see themselves not only as responsible for their own performance, but also for the achievements of the school. And although the relation between team identification and knowledge sharing has seldom been addressed in research so far, several studies have shown a relation between social identification and other positive behaviors, such as OCB and effort. Based on these studies a positive relation between team identification and knowledge sharing can be expected. By including team identification in the study and testing the relation between team identification and knowledge sharing, we aim to contribute to our understanding of the relation between knowledge sharing and the social relations in which these behaviors are embedded. A second matter is how the levels of trust within teams affect team identification, a matter which is under-addressed so far. Although, both trust and identification have been proposed and found to promote extra role behaviors such as effort (De Jong & Elfring, 2009) and OCB (Van der Vegt, Van de Vliert, & Oosterhof, 2003) the matter of how trust and identification are related is to our knowledge rarely addressed. Social identification studies posit positive characteristics of teams and leaders as antecedent

of identification, with a focus on justice as antecedent. In trust research, positive expectations of team members and team leaders are seen as the bases of mutual trust and trust in leaders. Yet, social identity studies trust is not systematically considered as a possible antecedent of identification. In trust research, on the other hand, identification is seldom included as a consequence of trust, despite acknowledgement of trust as a booster of thinking in terms of 'we' and team goal directedness, states which are also attributed to team identification. Both strands of research thus seem to coincide on the expectation that trust, as a positive characteristic of teams, enhances team identification. By putting this expectation to a test we contribute to clarification of the relation between two core concepts in present organization studies which are both considered promising antecedents of knowledge sharing within teams (Edmondson, 1999). By simultaneously studying trust in team leaders and trust in colleagues as antecedents of team identification, we contribute to our understanding of a related matter,, that is which of these two trust foci matters more to team identification and its consequences. Team leaders in schools, although often acting as *primus inter pares*, can be considered as an important antecedent for the functioning and the atmosphere of their team, next to the nature of the relations between team members. Teachers easily feel vulnerable towards managers, for instance when they are assigned tasks, when they are involved in conflicts or when their work is evaluated. *'Fear of exploitation and the nagging suspicion that they are treated unfairly'* by their manager, is a common phenomenon (Kramer, 1996). Trustworthy management can take away this fear or suspicion and thus release the road to a stronger identification with the team. Trust in colleagues, based on positive experiences and expectations may also forge individual teachers into a team, with which they all strongly identify.

A third matter is how divergent and convergent forces affect knowledge sharing within teams. Despite ample attention paid to this matter in the past years, the results are equivocal. While trust, as a converging force can promote knowledge sharing, diversity within the team seems a two-faced phenomenon. On the one hand, diversity by promoting richness of inputs may enhance the quality of organizational learning processes (Cummings, 2004). On the other hand, differences in people's cognitive schemas, information environments and distinctive values can cause difficulties in mutual understanding and coordination of efforts. (Jehn, Northcraft, & Neale, 1999). Milliken (1996) found negative relations between diversity and intra or extra role

behaviour. Especially value diversity has been found to negatively affect team commitment and social identification. We therefore explore a moderator effect of team identification on the relation between team value diversity and knowledge sharing. We hypothesize that if team identification is high, team value diversity will have a positive effect on knowledge sharing and team performance, while if team identification is low, value diversity will constrain knowledge sharing and team performance.

A last matter we address in this study is how knowledge sharing contributes to the performance of school teams. Although knowledge sharing often is advocated as panacea for promoting team performance, only few studies have tested this proposed relation (Cummings, 2004; Van der Vegt & Bunderson, 2005). By including team performance in our model we contribute to understanding of how knowledge sharing can contribute to the performance of teams, in this case teams of primary school teachers.

The research has been conducted in 34 Dutch elementary schools. Two questionnaires with validated scales for all variables used have been administered, one for the teachers and one for the school managers. The sample consists of 350 teachers and 34 headmasters. Performance is measured by self report data from the teams, by evaluations of the headmasters and by data from the quality reports of the Education Inspectorate.

This paper is structured in four parts. First, we describe the theoretical ideas that have inspired the research. In the second part the research design and methodology is given, followed by the description of the results. In the last part, the results are discussed, conclusions are drawn and directions for future research are formulated.

### **Knowledge sharing in teams**

Like many other professionals, teachers have to deal with a combination of individual and common tasks. Their individual and collective performance is partially dependent of the features and behaviour of their team. Following Cohen and Bailey (1997), school teams meet the criteria of what can be understood as a team, since they are a *'collection of individuals who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems (p 241).'* Teams are important in organizational learning processes.. Working in a team stimulates members to express their ideas and to test their value in

conversations with colleagues. The dialogue and knowledge exchange that is needed to develop and combine knowledge for innovation, takes mainly place at group level (Edmondson, 2002).

Team learning is also a linking pin between learning at individual and organizational levels (Bogenrieder & Nooteboom, 2004) . The tasks of teams in schools encompasses a variety of activities, like deciding about new reading methods, discussing learning backlogs or behavioural problems of pupils, preparing for visits of the Education Inspectorate and the organization of the musical on the last school day. All these tasks can hardly be performed properly without team members exchanging their ideas and knowledge.

Knowledge sharing can be defined as an activity to help communities of people work together, facilitating the exchange of their knowledge, enabling learning and increasing their ability to achieve individual and organizational goals (Hsiu-Fen Lin, 2006). Team members are each other's sources of knowledge. Knowledge sharing includes the exchange of verbal information, the coordination of expertise (Faraj and Sproull 2000) and communication about who knows what, also referred to as transactive memory (Lewis, 2003). The knowledge can be highly implicit or explicitly codified into documents and embedded in routines or systems (Nonaka & Takeuchi, 1994; Crossan, Lane & White, 1999).

The level and quality of knowledge sharing, and the strength of the relationship with team performance can vary widely between teams, dependent on several factors. The epistemological appearance of knowledge has consequences for the ways it is shared. Codification of knowledge for instance has a positive effect on the fluidity of knowledge. Edmondson et al (2003) found that the performance of later adopters of a new technology is improved faster by bringing codified knowledge into action in comparison to the performance of earlier adopters who had to rely on non-codified knowledge.

Sharing implicit knowledge is more difficult and in particular this kind of knowledge is seen as crucial for organizational learning (Nonaka & Takeuchi, 1994; Brown & Duguid, 2001). In sharing tacit knowledge, people are easily confronted with the incongruity of interpretations they have (Gherardi & Nicolini, 2000). In a study of antecedents of *stickiness of knowledge*, Szulanski (1996) mentions factors like a lack

of motivation to share, a low retentive and absorptive capacity, causal ambiguity and arduousness of the relationship between the exchanging parties. The absorptive and retentive capacity of persons is their ability to interpret, to value and to institutionalize the utilization of the knowledge of others. Causal ambiguity is originated by the embedding of knowledge in tacit skills. These tacit skills '*are often singled out as a central attribute of knowledge with respect to its transferability*' (Szulanski, 1996). The arduousness of the relationship complicates the exchange of knowledge, especially where the tacitness requires a degree of intimacy between source and recipient. As Nonaka and Takeuchi (1995) contend, trust provides the quality of relations needed for the exchange of tacit knowledge. Moreover, given the less articulated character of tacit knowledge, an overlap between the task-related knowledge of team members is needed to enable its transfer and to bridge incongruities of interpretation, by some authors referred to as cognitive distance (Bogenrieder & Nooteboom, 2004; Faraj & Sproull, 2000). These authors also argue that trust enables this bridging process.

Sharing knowledge can be considered as a form of altruistic behaviour, based on the willingness to contribute to a common goal and to see organizational knowledge as a common good, a willingness which is argued to be promoted by both trust (Bijlsma et al, 2008) and team identification (Moorman & Harland, 2002).

The quality and level of knowledge sharing in teams and the strength of its relation with team performance can vary widely between teams. Learning processes flourish in environments with the delicate balance between attentiveness to work processes, commitment to team goals, willingness to put in effort to reach these goals and trust. Commitment to team goals is an expression of team identification, while trust has been proposed to further both attentiveness and identification. In the next paragraph we explain how team identification operates and why it is proposed and found related to team performance and knowledge sharing.

### **Team Identification and Knowledge Sharing**

Several studies have proposed (Ashfort & Mael, 1989; Brewer & Gardner, 1996; Dukerich et al, 2002; Ellemers et al, 2004) and found (Worchel et al, 1998; Tyler & Blader, 2000; Bartel, 2001) that identification shapes behaviours that advance group

goals and performance of individuals and teams.

When knowledge sharing is seen as a special form of extra role behaviour, it is obvious that team identification is an important antecedent. Employees who identify themselves with their team are more likely to give support to team members, they tend to cooperate more and they define themselves by the characteristics that are observed as typical for their group.

Social identity theory helps to understand social behaviour that is primarily relevant at the collective level (Ellemers et al, 2004). Social identification can be defined as a process that *'refers to the inclination of particular individuals to perceive themselves as representatives of a particular group, which makes them perceive characteristic group features as self-descriptive and leads them to adapt distinctive group norms as guidelines for their own behaviour'* (Ellemers et al, 2004).

Social identification with groups is rather generally explained as a multidimensional concept with an emotional, cognitive and an evaluative component. The emotional component, the most important and dominant component, is often considered as identical to affective commitment. It is the largest drive for people to adapt their behaviour to their group membership (Tajfel, 1978 in: Ellemers et al, 1999). A stronger identification and commitment with their team make people define their work in terms of group goals and group roles.

Organizational identification can be directed towards different aggregation levels, which can reinforce each other but which also may compete for dominance.

Organizational identity in this way is a function of the belongingness to a team, the organization, plant or a professional category. A social identity can be in such case disparate and loosely coupled (Ashforth & Mael, 1989). With this respect a more homogenous identity is expected in teams of teachers in elementary schools. The teams are mostly of a moderate size and coincide more or less with the school.

Teachers will identify themselves much more with the school than with an overarching foundation with a board of governors for a large number of schools.

Until recently, the effect of identification on knowledge sharing has received limited attention in organization research. The low level of attention is remarkable given the profoundly researched relationship between identification and organizational citizenship behaviour (OCB). In their critical review of OCB and related constructs, Podsakoff et al (2000) list altruism, sharing resources, organizational compliance and individual initiative as important aspects of this behaviour. These elements are also



present in knowledge sharing, while this concept, , can be similarly described as voluntary behaviour from which the outcomes are advantageous for the organization. Sharing of knowledge supposes the willingness to contribute to a common goal and to see organizational knowledge as a common good. It includes helping others with their work, sharing information resources, and initiative to come up with suggestions when it is recognised that colleagues need the knowledge that a person has available. As such, knowledge sharing can be considered as a specific kind of organizational citizenship behaviour.

Only a few authors have addressed the relation between identity and knowledge sharing. Nahapiet & Goshal (1998) see identification as a resource that effects the motivation of employees to share their knowledge. Contradictory identities in a team can be a barrier for learning. Van der Vegt & Bunderson (2005) show, furthermore, that team identity is an important positive force in multidisciplinary teams. Teams with high identification show more learning behaviour and better team performance, especially in case of moderate expertise diversity. Taking into account the analogy between knowledge sharing and OCB and the often strong relation between social identification and OCB, a direct positive effect is expected from social identification on knowledge sharing.

*Hypothesis 1: Team identification will be positively related to knowledge sharing within teams*

### **Trust, Identification and Knowledge Sharing**

Trust is commonly understood as a starting mechanism in support of cooperation between actors (Gambetta, 1988). Following the highly cited definition of Rousseau et al. (1998, p. 395), in this study trust is defined as ‘a *psychological state comprising the intention to accept vulnerability based on positive expectations of the intentions or the behavior of another.*’ Trust begins where rational prediction ends (e.g. Luhmann, 1979; Gambetta, 1988), enabling actors to take a leap of faith beyond that which reason alone would warrant (Simmel, 1950; Bradach & Eccles, 1989; Lewis & Weigert, 1985). Building on these authors, it is argued that this leap of faith implies suspension of doubt about the possibility that another’s action will be based on self-interest (that is ‘I’-rationality), assuming that the other will reciprocate the ‘we’-rationality that is signaled by trust (Weibel, 2004; Möllering, 2005). By expecting

reciprocation of the 'we rationality' that is signaled by trust, the leap of faith can be taken.

Dirks (1999) follows a similar reasoning, that in low trust situations work motivation of individuals is transformed into effort to reach individual goals, while in high trust situations motivation stirs effort directed at team goal realization. Sabel (1993), inspired by social dilemma theory, similarly argues that if trust is low or absent in a team, no one will risk moving first and all team members will sacrifice the gains from cooperation in increasing individual effectiveness. These authors thus argue that if trust increases, sense making in terms of 'I' and individual interests, is replaced by sense making in terms of 'we' and collective interests, thus promoting team goal directedness.

Other authors have also alluded to differences in meaning giving and behaviors of actors in low trust and higher trust situations. Next to 'I' versus 'we'-focused meaning giving, a shift in meaning giving from a focus on risks to a focus on opportunities is mentioned in the literature. Based on a cognitive resources framework, Mayer and Gavin (2005) argue that in situations of low trust in managers, individuals are immersed in risk perceptions, and spend much energy in non-productive issues such as vigilantly watching the manager, defensive behaviors, self-protection (Ashfort & Lee, 1990; Deming, 1994) and worries. As a consequence, their ability to focus on the tasks at hand diminishes. If trust grows, cognitive resources will be more fully used to focus on the tasks, because risk is less salient, and self-protective cognitions and actions are diminished (Mayer and Gavin, 2005). Therefore, we contend that trust promotes both the salience of collective goals and diminishes the salience of risks in favor of opportunity salience.

A third, related difference is how organizational members process and interpret information in low and high trust situations. This difference in information and influence sharing also includes knowledge sharing.. March and Olsen (1975) propose that trust leads to interaction seeking, to willingness to share views, preferences and central concerns with trusted others and to attribution of benevolent events to them. In situations of low trust or distrust, interaction is avoided, actors are unwilling to share views, preferences and control concerns, and detrimental events are attributed to the not trusted or distrusted others.

In line with this reasoning, Zand (1972) proposed and found that in low trust situations group members are less involved in team processes, share less information and ideas, show lack of openness and avoid influence of others. In higher trust situations, team members are more open to discussion, communicate more openly, develop more innovative solutions and solve their problems more effectively as a group (Zand, 1972). Other authors, in support of these arguments, proposed or found low trust to be related to avoidance of influence (McKnight and Chervany, 2001, Sheppard & Tuchinsky, 1996), disbelief and information distortion (Bromiley & Cummings, 1995; Sheppard & Tuchinsky, 1996), and attribution of negative motives (Kramer, 1996).

These theoretical ideas and research findings support a positive relation between the level of trust within teams, whether trust in colleagues or trust in team leader, team identification and the degree of knowledge sharing. The characteristics of higher trust, that is thinking in terms of ‘we’, attentiveness based on opportunity salience and willingness to share, are all factors that have been found to promote learning processes in teams, including knowledge sharing. We thus contend that team identification mediates the relation between trust and knowledge sharing.

*Hypothesis 2: Trust in colleagues will be positively related to knowledge sharing*

*Hypothesis 3: Trust in team leaders will be positively related to knowledge sharing*

*Hypothesis 2a: The relation between trust in colleagues and knowledge sharing is mediated by team identification.*

*Hypothesis 3a: The relation between trust in team leaders and knowledge sharing is mediated by team identification.*

### **Trust in Colleagues, Knowledge Sharing and Team Performance**

If the proposed differences in meaning giving and behaviors between low and high trust situations are applied to teams, it can be expected that as trust in colleagues increases, team members are more likely to adopt a ‘we-rationality’ within the group, tend to seek interaction with other team members and willingly share seeing, liking and central concerns with them. Meaning giving in terms of group goals and

opportunities for success will be salient. Directedness towards team and organizational goals can have a two-fold positive effect on team performance. First, adopting team goals provides a cognitive focus which promotes *individual efforts* of team members towards realizing these goals, a factor that is proposed and found to promote team performance (Dirks, 1999). Second, team goals provide a cognitive focus on *the interrelatedness*, the collective character of individual efforts of several actors, which is argued to reduce process losses and to enhance performance (Saavedra et al., 1993 in Langfred, 2004). These effects have also found to be promoted by sharing, of influence and knowledge sharing which were argued before to flow from trust (Zand, 1972). The third beneficial effect of trust proposed, opportunity salience, has been related to performance as well. Mayer & Gavin (2005) argued and found that salience of risks promotes defensive behaviors, which have a detrimental effect on the ability to focus on the tasks (Mayer & Gavin, 2005).

However, results on the relation between trust in team members and team performance are not very robust (Dirks, 1999, Langfred, 2004). While in some studies positive relations between trust in co-team members and team performance were found (Klimoski and Karol, 1976, Smith & Barclay, 1997; Schippers, 2003, Costa, 2003; Erdem et al., 2003; Colquit et al., 2005), other studies found trust in team members unrelated to team performance (Aubert and Kelsey, 2003, Porter and Lilly, 1996; Dirks, 2000) or even negatively related (Langfred, 2004).

Yet, since most studies found a positive effect, we hypothesize a positive relation between trust in colleagues and performance, which is mediated by knowledge sharing.

*Hypothesis 4: Trust in colleagues will be positively related to team performance.*

Several studies have proposed or found that knowledge sharing is dependent on trustful relations within teams while in a few studies positive performance consequences of knowledge sharing were found. Edmondson (1999) found in interdisciplinary action teams that speaking up, by showing concern and asking questions, has positive effects on learning to deal with new technologies. Weick & Roberts (1993) use the concept of heed for careful, critical, purposeful behaviour, which is seen as an important quality for good and failure-free performance of groups, an effect tested and found by Bijlsma et al (2005; 2008). A watchful and involved

attitude towards team members on which knowledge sharing and its effects flourish, needs a climate of supportiveness, belongingness and trust. Von Krogh (1998) too stresses the importance of trust and supportiveness and postulates that people in a high-care environment, where they trust each other and are willing to help their colleagues, try to reach a 'maximum leverage on others knowledge', while in a low-care environment, the willingness to share knowledge is dependent on the exchange value of it. Osterloh & Frey (2000) like Von Krogh (1998) point to the importance of good social relations for sharing knowledge within teams. We therefore formulated the following hypotheses:

*Hypothesis 4a: The relation between trust in colleagues and team performance will be fully or partly mediated by knowledge sharing.*

### **Trust in Supervisors, Knowledge Sharing and Team Performance**

If the proposed differences in meaning giving between low and high trust situations are applied to the team member-team leader relation, it can be expected that where trust in the supervisor is high, team members are more likely to adopt a 'we-rationality' with team leaders, tend to seek interaction with them and willingly share their seeing, liking and central concerns. Meaning giving in terms of shared goals and opportunities for success will be salient. Since realizing high team performance is a central concern to team leaders, trust in these managers can be expected to contribute to team members' directedness at team goals, as defined by the organization and to behaviors that contribute to attainment of the team's goals. Following this argument, trust in team leaders can redress possible performance detriments of high trust in colleagues, which were discussed earlier. If the 'we-rationality' adopted in trusting other team members results in adopting team goals that are not congruent with the team goals as defined by the organization, team performance may actually suffer. High trust in managers can promote the goal-congruence needed for high team performance. Next to team goal directedness and goal congruence, the positive effects of knowledge and influence sharing and of opportunity salience, which were discussed as performance benefits of trust in team members, can also be seen as performance benefits of trust in managers, adding to the performance of the team-

manager unit.

Empirical support for a positive effect of trust in managers on team performance is, however, scarce. And despite repeated emphasis on the importance of team leaders for the functioning of teams (Webber, 2002, Dirks and Ferrin, 2002; Gillespie and Mann, 2004), even fewer studies have paid attention to the relationship between trust in managers and team performance so far (Dirks, 2000; Bijlsma-Frankema et al., 2008). The study of Dirks (2000) of basketball teams compared the effects of intra-team trust and trust in the coach. He found a direct effect of trust in the coach on team performance, but not of intra-team trust. Dirks concludes that trust in supervisors makes team members might suspend their personal motives and channel their energy towards ‘the roles specified by the leader’ and ‘to work toward the performance-related objectives and strategies set by the leader’ (2000, p. 1005). In the study of Bijlsma-Frankema et al. (2008) involving knowledge intensive teams, in which performance benefits of trust in co-team members and trust in supervisors were compared, both types of trust were related to team performance. Trust in supervisors had a direct effect on team performance, while the effect of trust in co-team members was mediated by heedful interrelating (Weick & Roberts, 1993), a variable which implies subordination to team goals (as defined by the organization).

The positive relations between trust in supervisors and team performance found in these studies are indirectly supported by studies that show other positive consequences of trust in managers, such as individual performance (Early, 1968; Robinson, 1996; Rich, 1997), low intention to quit (Rich, 1997) and organizational citizenship behavior (Deluga, 1995; Podsakoff et al., 1996). Dirks and Ferrin (2002) also found these consequences in a meta-analysis of trust in leadership. We further contend that, similar to trust in colleagues, knowledge sharing will also mediate the trust in team leader-performance relation. The following hypotheses were formulated:

*Hypothesis 5: Trust in team leaders will be positively related to team performance.*

*Hypothesis 5a: The relation between trust in team leaders and team performance will be fully or partly mediated by knowledge sharing.*

## **Diversity and knowledge sharing**

Social identification and knowledge sharing are expected to have a positive relation. An element that complicates this relation is the composition of teams. Homogenous teams tend to have higher levels of team commitment. People with a common background, the same education or with identical values understand each other better and it is easier for them to identify with one another. Differences in people's cognitive schemas, information environments and distinctive values can cause difficulties in mutual understanding and coordination of efforts (Milliken & Martins, 1996). At the same time there is some evidence that diversity in teams helps to improve the process of knowledge creation, knowledge sharing and innovation. Heterogeneous teams have more knowledge at their disposal and members can challenge each other with diverging views, resulting in higher quality solutions. The paradoxical insights of the effect of diversity make it necessary to unravel the relation between team composition, team identification and knowledge sharing.

Teams can be heterogeneous in many ways. Originally, diversity was approached as a phenomenon of categorisation according to observable properties, like gender, national or ethnic background, age or other forms of social category membership. Such differences matter in cooperative relations. Characteristic similarity of persons is regarded as an important element for the origination of trust, while diversity keeps people at a distance and declines the tendency to positive social interaction (Creed & Miles, 1996). Knowledge sharing, team learning and innovativeness in groups of members with different nationalities are found to be lower in teams in multinational companies (Cummings (2004; Zellmer-Bruhn & Gibson, 2006; Gibson & Gibbs, 2006). Categorization is related to potentially harmful effects like intergroup biases and psychological unsafe environments. These phenomena may work as barriers for cooperation and knowledge sharing.

A more specific view of diversity is offered by those who look for the elements of diversity that influence the functioning of workers. Functional, informational and expertise diversity are examples of more cognitive oriented forms of diversity, which are found in multidisciplinary composed teams. These cognitive forms of diversity enhance knowledge variety, so that team members serve as important resources for their colleagues. They are caused by variety in experiences, educational background or functions or differences in knowledge, skills and capabilities, resulting from experience or education as perceived expertise diversity. The research outcomes, considering the relations between expertise diversity and knowledge sharing are

contradictory. (Jehn et al; 1999; Van der Veght & Van de Vliert, 2005). Experts, for instance, tend to seek more support by their peers in other teams than within their team by colleagues with another disciplinary background (Cummings, 2004). A potential vulnerability of multidisciplinary groups is the negative categorizing of different others who don't understand essential issues, because of the distorting perspective of their disciplinary background. Slightly positive effects of the interaction between expertise diversity and team identification on team learning behaviour are confirmed by Van der Veght & Van de Vliert, 2005). A higher level of social identification appears to neutralize the negative side effects of expertise diversity.

In another approach people are distinguished according to differences in their values. Value diversity refers to the variety in assumptions and ideas about tasks, work approach and goals Jehn et al (1999). Jehn found value diversity to be negatively related to work performance, group efficiency and positively related to task conflicts. A study of Chou et al (2008) points in the same direction, and shows positive relations between shared work values and team member performance.

Considering the frequent negative research outcomes when other than task-related forms of diversity are at stake, it can be assumed that value diversity too has a negative effect on knowledge sharing. Yet this is not without debate. Nootboom (2000) states that to a certain degree of cognitive distance between knowledge domains is needed as a condition for learning. A large distance causes problems of understanding since there is a lack of overlap in cognitive frames. In case of a small cognitive distance, the similarity in knowledge ends up in little need to learn from each other or little to gain in learning. Nootboom suggests an optimal area for organizational learning in which there is sufficient understanding to communicate and sufficient diversity to discover new insights and complementary knowledge. Although the expression of cognitive distance suggests a relation with diversity of knowledge, Nootboom explicitly extends the concept towards the domain of emotions and values.

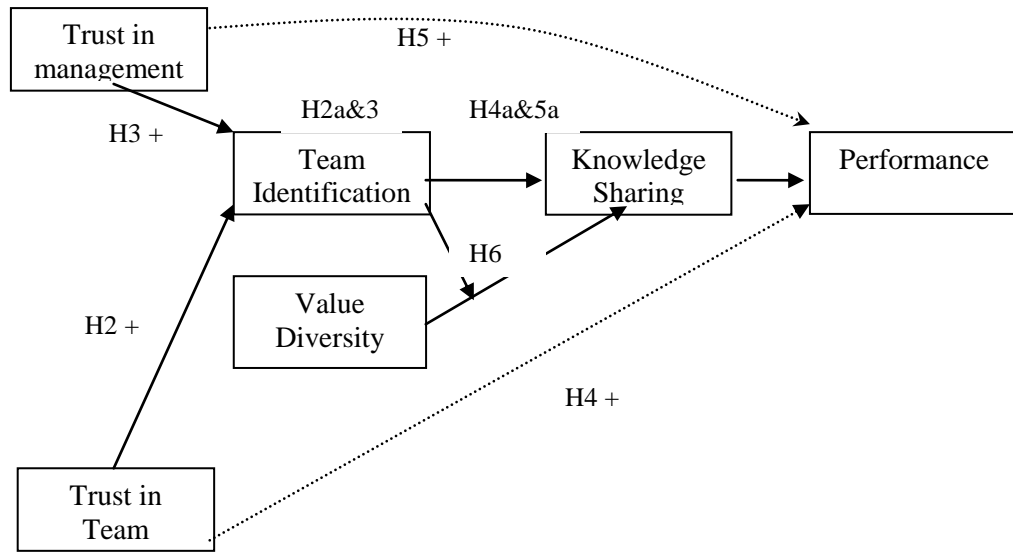
The relationship between diversity and knowledge sharing is perhaps not as bleak as direct effects studies have suggested so far. At second sight several studies which included interaction effects demonstrate more differentiated findings. Van Knippenberg et al (2004), for instance, show that harmful effects of social category diversity are dimmed by factors as high task motivation and higher task complexity.



Belief about the value of diversity in teams is another factor that influences the performance of teams. Teams or subgroups with a negative attitude towards a diverse composition are less inclined to explore what other members can contribute to the performance of their team. There is some evidence that beliefs in diversity is a moderating factor between informational diversity and performance, at least in heterogeneous groups (Homan et al, 2007). Van der Vegt & Bunderson (2005) discovered moreover that in teams with low collective identification, expertise diversity is negatively related to team learning and performance. If team identification however is high, the relationship is positive. The findings of these studies are in line with outcomes of studies that show effects of diversity to be compensated by a positive team climate. Higher psychological safety in the communication climate of international virtual teams helps to elucidate differences in norms, culture and nationalities, conflicts are better resolved and members feel more comfortable to speak up and ask for clarifications (Gibson & Gibbs, 2006). In the study of Chou et al (2008) interpersonal trust is found as an important psychological mechanism that influences the relation between values on one side and performance and satisfaction with cooperation on the other side. These relations are fully mediated by trust. More specific the weight of shared work values on team member performance became insignificant, when trustworthiness was introduced in a next step.

In sum, the potential negative influence of value diversity on knowledge sharing does not seem to be inevitable in case people show a sufficient identification with their team. It is likely that social identification is a moderating factor between value diversity and knowledge sharing. We expect the effect of diversity on knowledge sharing to be neutralized in case of high team identification:

*Hyp. 6: Team identification and value diversity interact in such a way that when identification is high value diversity has no effect on knowledge sharing, while when identification is low value diversity will have a negative effect on knowledge sharing.*



**Fig. 1: Research model**

### Methodology

The aim of this research is to explore the antecedents of knowledge sharing in teams and to verify the relations between the variables described. Previous research has yielded validated instruments to measure these variables, which makes it possible to carry out a quantitative cross-sectional study. The research has been carried out in Dutch primary schools. The schools are from different kinds of denomination and are scattered all over the country with a slight underrepresentation of Roman Catholic schools and of the southern part of the country. Age and gender are in line with the population features. School size is somewhat larger, probably because of a higher percentage of schools from large cities. The population data of the Dutch Office for Statistics and of the Ministry of Education are used for these comparisons (CBS, 2008; Min OCW, 2008).

About 70 schools were invited to participate, while 35 of them met this request: 375 teachers filled in a questionnaire (response rate 41%) and 32 of the 35 headmasters did so with their own questionnaire. Of the teachers 85% is female and half of the sample is working less than 4 days a week. The median age is 46 and the median experience in education is 18 years.

The questionnaire counted 69 questions, mostly statements with Likert scales. For knowledge sharing eleven items were used from Van den Hooff & De Leeuw van Weenen (2004), 5 items referring to knowledge collecting and 6 to knowledge donating. For social identification the adjusted scale of Mael et al has been used because of better adaptation to team identification (Van Knippenberg, 2000). Value diversity has been measured by the instrument of Jehn et al (1999). The scale consists of 6 items. For perceived team performance a scale with 5 items of Bontis et al (2002) has been taken. Trust in team and trust in management were derived from Cook & Wall (1980). The scales contain 5 and 7 items. The validity of the variables has been verified by factor analyses, followed by reliability analyses. For the knowledge sharing a clear two-factor solution has been found, distinguishing collecting and donating knowledge (Maximum Likelihood, with oblique rotation method). One item loaded on both factors and was removed. All scores were between .50 and .97. The reliability of the variables ranges from 0.80 to 0.92, which is considered as good (Table 1).

In this paper the analysis is limited to the individual data of teachers. Later, when more data are collected, the study will be extended to a multilevel study in which the school data and the headmaster's questionnaires are taken into account.

## **Results**

As a first step the correlations of the key variables are presented (tab. 1). The analysis shows significant associations between all variables involved in the research model. The directions of the correlations are in line with the expectations. *Value diversity* correlates negative with the other variables. *Performance* shows rather high correlations with all other variables. Since all correlations are significant, there is no restriction for regression and mediation analyses. Since all correlations are lower than .80, there is little fear for multicollinearity.

	<i>Reliability</i>	<i>Trust in Management</i>	<i>Trust in Team</i>	<i>Team Identification</i>	<i>Value Diversity</i>	<i>Knowledge Sharing</i>
<b>Trust in Management</b>	.92					
<b>Trust in Team</b>	.84	.55**				
<b>Team Identification</b>	.82	.40**	.45**			
<b>Value Diversity</b>	.89	-.39**	-.63**	-.44**		
<b>Knowledge Sharing</b>	.87	.34**	.48**	.46**	-.44**	
<b>Performance</b>	.84	.61**	.66**	.50**	-.60**	.50**

**Table 1:** reliability and correlation (\*\* significant at the 0.01 level, 2-tailed).

### *Test of hypotheses*

A multiple regression analysis has been carried out to test the first three hypotheses. The outcomes support initially that *team identification* is positively related to *knowledge sharing* within teams (hyp.1). However model 3 shows a strong interaction effect with *value diversity* that suppresses *team identification*. The hypotheses 2 and 3 state a relation between two kinds of trust and knowledge sharing. The relation with *trust in teams* is significant, while *trust in management* has no significant effect on *knowledge sharing*. The mediation between trust and *knowledge sharing* is clearly exposed for *trust in team*: the original beta is reduced after adding identification from .41 to .26. The effect, although much smaller, is still significant. A partial mediation in other words. Except the indirect effect through *team identification*, *trust in team* has also a direct effect on *knowledge sharing* (hyp. 2a). *Team identification* is not mediating the effect of *Trust in management*, since this variable does not show any significant effect on *knowledge sharing* (hyp. 3a)..

Model		Unstandardized Coefficients		Sig.
		B	Std. Error	
1 R <sup>2</sup> =.25	(Constant)	2,09	,174	,000
	Trust in Team	,406	,050	,000
	Trust in Management	,055	,037	,138
2 R <sup>2</sup> =.32	(Constant)	2,27	,318	,000
	Trust in Team	,255	,057	,000
	Trust in Management	,010	,036	,775
	Value Diversity	-,103	,041	,012
3 R <sup>2</sup> =.34	(Constant)	2,30	,315	,000
	Trust in Team	,249	,056	,000
	Trust in Management	,012	,036	,730
	Value Diversity	,372	,176	,035
	Identification with Team	,490	,110	,000
	Interaction Value Diversity / Identification with Team	-,743	,267	,006

Table 2: MRA Dependent Variable: Knowledge Sharing

What about the moderation that is expected from *social identification* on the relation between *value diversity* and *knowledge sharing* (hyp. 6)? The analysis shows a large and significant interaction effect. When we distinguish between two groups identifying high and low with their team, the following effect appears (fig. 2).

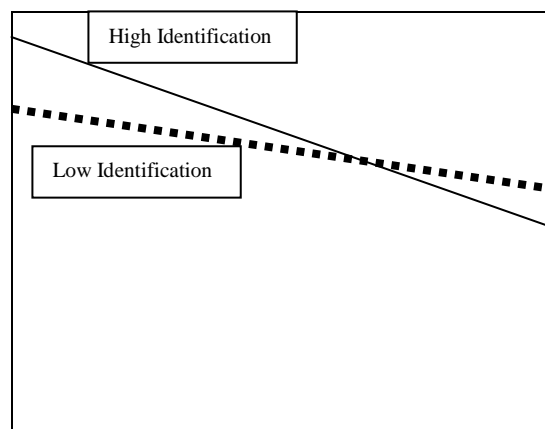


Fig. 2: x = knowledge sharing; y = value diversity

As expected, both the low identification function (4,2-0,15x) and the high identification function (4,8-0,33x) have a significant negative beta. The more *value diversity* in a team, the less their members are inclined to share their knowledge. Contrary to the expectations this effect is stronger in the high identification group, since it was stated in hypothesis 6 that a higher identification with the team, would neutralize the negative consequences of value diversity. No sufficient support is found for the hypothesis. In a situation of low *value diversity*, *knowledge sharing* is higher in a high identification group, but in case of large value diversity, the high identification group is even somewhat lower in sharing their knowledge.

Model		Unstandardized Coefficients		Sig.
		B	Std. Error	
1	(Constant)	1,50	,159	,000
	Trust in Team	,65	,039	,000
2	(Constant)	,98	,187	,000
	Trust in Team	,55	,043	,000
	Knowledge Sharing	,24	,048	,000

Table 3: Dependent Variable: Perceived Performance

In hypotheses 4 and 5 *knowledge sharing* is expected to mediate between the two kinds of *trust* and *performance*. The mediation is supposed to be partially since there are sufficient indications of a direct relation between *trust* and *performance*. The conditions for a mediation analysis are met (Baron & Kenny, 1986): in both cases a significant correlations between the variables concerned, have been demonstrated (table 1). Both *trust in team* and *trust in management*, the analyses show a slight decline when *knowledge sharing* is added in the second model (table 4 & 5). The data give evidence for both hypotheses.

Model		Unstandardized Coefficients		Sig.
		B	Std. Error	
1	(Constant)	2,42	,123	,000
	$R^2 = .37$ Trust in Management	,44	,031	,000
2	(Constant)	1,27	,181	,000
	$R^2 = .47$ Trust in Management	,36	,030	,000
	Knowledge Sharing	,37	,046	,000

Table 4. Dependent Variable: Perceived Performance

### Findings and discussion

The provisional results of this research demonstrate mixed outcomes. The relations between *trust in team*, *identification* and *knowledge sharing* are in line with the expectations of hypotheses 1, 2 and 2a: *trust in team* is directly and positively related to *identification* and *knowledge sharing*, while *identification* with their team also acts as a mediator between *trust in team* and *knowledge sharing*. The relations between *trust in colleagues*, *knowledge sharing* and *performance* point to the same direction. According to hypotheses 4 and 4a a direct and a moderate indirect effect through *knowledge sharing* have been found.

For *trust in management* the outcomes are differentiate. No effect on *knowledge sharing* and no mediation has been noted, as was predicted in hypothesis 3 and 3a, but for 5 and 5a support has been found.

The positive relations between *trust in colleagues*, *identification* and *knowledge sharing* give full support to the idea that a ‘we’ rationality has been adopted that leads to common goals. In the studies mentioned in the theory section (Webber, 2002, Dirks, 2000; Dirks & Ferrin, 2002, Gillespie & Mann, 2004) empirical support for effects on *performance* was scarce. In this study some effects were found, but not on *knowledge sharing*. Of course school teams of teachers are quite different from the basketball teams, studied by Dirks (2000). School teams are much more self organizing and less monitored than teams in ball games. The teams are also less interrelated than teams where the personal performance has no meaning without the team performance. These considerations are reasons for a further look at the specific team features in this research.

The other outcome that needs further attention is the relation between identification, value diversity and knowledge sharing. As expected there was a negative effect from diversity on knowledge sharing, however the predicted interaction could not be demonstrated (hyp. 6). Instead high identification groups seem to be more vulnerable for the disrupting effects of value diversity than people who identify themselves less with their team. An analysis on team level is needed to give more insight in this phenomenon.

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