

Creativity at Work:

**Why does participation
in decision making
enhance creativity in
work groups?**
- An integrative review.

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Why does participation in decision making enhance creativity in work groups? - an integrative review.

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1. Introduction

It seems to be an established fact in the organizational psychological literature that participation in decision making leads to creativity and innovation in work groups and organizations. A quite extensive amount of research has claimed that the link exists, although only a somewhat smaller amount of research has established that there is a link between the two constructs of participation in decision making and creativity. But although this link has been clearly documented theories with clearly stated causal explanations of *why* participation in decision making (pdm) would lead to creativity and innovation are extremely rare. The literature has pointed to a large number of mediating variables and possible effects of pdm that could possibly explain the link to creativity, but explicit causal theories and experimental evidence of the validity of such theories remain relatively few. Suggested mediating factors include such different models as enhanced intrinsic motivation (Amabile, 2001; Conti & Amabile, 1999), reduction in resistance to change (De Dreu & West, 2001), pooling of unshared knowledge (Latham, Winters, & Locke, 1994) and better utilization of individual differences in cognitive style (Kirton, 1989), and improved work environment for creativity (e.g., Isaksen, Lauer, Ekvall, & Britz, 2001).

As West (1996) has pointed out, the existing models of work group effectiveness (which includes creativity) are largely descriptive of broad classes of variables which may influence effectiveness, limiting their theoretical status and ability to stimulate scientific research and theoretical development. To counter this tendency West (1996) recommended abandoning an overall theory of work group effectiveness in favour of more focused and context-specific theoretical approaches. This is the approach taken here, as the present review will focus on the causal link between participation and creativity in specific types of work groups. In this integrative review we will look at two general explanatory models of why pdm leads to creativity in work groups and the experimental evidence favouring these models. On the basis of this review and in light of existing research we will then attempt to outline a model of the causal link between pdm and creativity that is theoretically coherent and empirically testable, and which is in line with existing research.

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Hopefully the explicitation of such a model will direct future research towards testing specific causal relationships between pdm and creativity.

Before we can venture into a discussion and review of what exactly the causal links between pdm and creativity may be, we first need to define what we mean by participation, creativity and innovation.

2. Definition of creativity and innovation

Creativity refers to an area of study ranging over creative persons, products, processes and the study of creative context (or 'press') (Rhodes, 1961; Mooney, 1963). With such a diverse field of investigation, one could imagine that consensus on a single definition would be scarce. However, in the last couple of decades, some consensus has appeared in the creativity research community concerning what to study: Creativity occurs when someone creates an original and useful product (Mayer, 1999). This definitorial emphasis on creative products has helped expand the previous understanding of creativity as merely a trait or a single stage in the creative process (e.g., 'insight'), to the understanding that creativity is first and foremost a matter of changing the world (Feldman, Csikszentmihalyi, & Gardner, 1994) by creating novel and useful products. The products being brought into existence needs to be novel and original, as well as appropriate, useful and adaptive. However, the definition also requires 'someone' who carries out the creative act in a series of steps, and of course a context within which the acts occur. This definitorial emphasis on creative products has enabled researchers to study creativity in not only individuals, but also groups and organizations. Although the relation between pdm and creativity in principle could be (and have been, see King, 1990 for a review) studied at all these levels, the level chosen for review and examination here is that of the work group.

When focusing on the work group rather than the creative individual the explanatory models for how creative products come into existence is usually directed towards factors in the environment (called antecedent factors) and in the creative process (e.g., West, 1990). This is not saying that the individual person (e.g, traits and cognitive mechanisms) does not play a part in the explanation (for a review, see Paulus, Brown, & Ortega, 1999), but the main focus when looking at groups cannot be explanations of the lone creative genius, and his sole cognitive workings. Most research in the area has sought such explanations either in the context (e.g., work environment or creative climate), or in the characteristics of the creative process. We will look at both types of explanations below.

Explanations that look at how the *organizational context* or work environment influences creativity typically try to pinpoint a series of mediating variables in the organization that have a strong impact on processes and people, and thereby the production of creative products and innovations. When trying to determine whether pdm enhances the organizational context for creativity, the typical way of doing so would be to try to determine whether pdm facilitates each mediating variable or not. We will look closer at what these mediating variables are in the next sections.

Explanations linking pdm to the *creative process* typically link to the requirements of either known mechanisms or stages in the creative process, in an attempt to determine how pdm would facilitate the process. The creative process is traditionally described as consisting of at least four stages: preparation, incubation, illumination, and verification (e.g., Wallas, 1926; Ghiselin, 1954; Koestler, 1964; Csikszentmihalyi & Sawyer, 1995) although slightly different names have been used. These stages highlight the problem *solving* nature of creativity, which theorists have argued does not do justice to creative processes that pinpoint creative problems in the first place (Getzels & Csikszentmihalyi, 1976). This has led to an increasing emphasis on problem finding behavior in addition to creative problem solving (Jay & Perkins, 1997; Hoover & Feldhusen, 1994; Runco & Chand, 1994).

The traditional description of the creative problem finding and solving process ends with the verification stage, where the product is tested and evaluated, and finalized. However, in real-world organizations creative products needs to be implemented – put into operation – to finalize the process. However, the implementation aspect of creativity includes some processes and requirements we may not intuitively associate with creativity itself, such as a need to communicate the product to the world or domain and persuade others of it's novelty and usefulness (Simonton, 1988), along with social and practical aspects of it's implementation, such as overcoming resistance to change and creating commitment to the new product. The different requirements and processes operating in the creative process and the implementation stages has led to a conceptual separation between *creativity* which involves the above mentioned creative problem finding and – solving stages and *innovation* which involves the successful implementation of creative ideas within an organization (Amabile et al., 1996; De Dreu et al., 2001). This form of innovation, where the implemented product is created by the work group, has been called 'emergent innovation' (e.g., King & Anderson, 1990; West, 1990) to separate it from innovation that is merely imported from the outside or imposed by management. Some authors have argued that creative processes (such as discovery) and the implementing aspects of innovation may require quite different management strategies (Argote, Gruenfeld, & Naquin, 2001) and organizational structures (Holbek, 1988; for similar arguments on organizational learning, see Weick & Westley, 1996). So even though the progression from the creative process into innovation may seem like a natural one, the distinction is conceptually and practically important.

We still need to define what kind (or rather, what level) of creativity we are talking about. It is possible to discern different levels of creative products by classifying to whom it is novel and useful (e.g., Johannessen, Olsen, & Lumpkin, 2001; Cohen, 1989), whereby creativity reception by other groups becomes an integral part of creativity estimates (Vissers & Dankbaar, 2002). For example, a scientific research group working on creating a novel scientific theory is working on a product that is novel and useful not only to the group itself, but also to the entire research community, the domain and field (Csikszentmihalyi, 1990; Csikszentmihalyi, 1988). Along this line of thinking, a problem solving group (e.g., Quality Circles) working on creating or improving a new product to be implemented and used in daily operations across an entire organization is involved at a lower level of creative endeavour. And finally, an autonomous work group that creates a

new way of carrying out their own work, has created a product that is perhaps novel and useful only to the work group itself, which would place the product at yet a lower level of creativity. There are some important differences in the processes between different levels. In particular the implementation stage may differ quite markedly between a scientific research group trying to convince the scientific research community that their discovery is a legitimate one, and an autonomous work group that implements a novel approach to their own work into their daily procedures. This illustrates that the difference between levels mainly concerns whom the product is likely to 'spread' to; the group itself; other groups; domain and society. With this caution in mind we will narrow the level of creativity used in the present integrative review down to work group innovation (i.e., lower levels of creativity), where the novel and useful product is implemented in the organization. This level of investigation is in line with other researchers in the area, such as West (e.g., De Dreu et al., 2001; West & Anderson, 1996) and Amabile (e.g., 1988; 2001; Amabile et al., 1996). The extent to which this level of creativity generalizes to higher levels (such as scientific research groups making discoveries or product development groups creating breakthrough inventions for the market) will have to be an empirical question.

3. Definition of participation

Having defined creativity and innovation, we also need to define participation, and specify the types and aspects thereof we are talking about in relation to creativity. Heller et al. (1998, p. 15) defined participation as "...a process which allows employees to exert influence over their work and the conditions under which they work". An important distinction in this connection is between direct and representative participation. Direct participation involves the direct involvement of individual employees (e.g., problem solving groups), whereas representative participation involves employee representatives, often selected by unions. For the present purposes we will only deal with direct participation, as that is the kind of participation that involves creativity in work groups. In terms of creativity the important thing is for subjects to be involved directly in decision making processes and discussions. Bearing this in mind, a group of elected representatives which are involved directly in decision making processes will also potentially be more creative *in that group setting* – but the work force who have elected or appointed them is not likely to be. Examples of the kind of participation in work groups we will deal with are autonomous and semi-autonomous work teams (also called decision-making work teams), product development teams, Quality Circles and problem solving groups, and project teams. Obviously the degree of participation in decision making varies quite a bit between these types of groups, and the particular organizational context within which they are placed. Comparing Quality Circles with autonomous groups makes the variability clear: Quality Circles are temporary, often voluntary, parallel participation structures with no formal authority invested in them. QC's must seek to have its ideas and solutions accepted by management by virtue of the quality of the solution forwarded and supporting argument (Cordery, 1996). Autonomous groups, on the other hand are permanent, formally constituted work groups with formal authority that interact directly.

These groups have the capability of implementing innovations into their own work process without obtaining approval from outside.

But despite these differences we shall try to determine how the participative qualities they share influence creativity and innovation in the work groups.

4. The link between participation and creativity

One of the major arguments for introducing participation in work groups has been the argument that participation can lead to enhanced creativity and innovation (Shapiro, 2000; Plunkett, 1990; Kanter, 1983; West, 1990). King (quoted in Anderson, 1992) reviewed many of the studies into the effects of leadership style on innovation, and concluded that the general consensus supports a democratic-participative style as being a facilitator of innovativeness in work groups. In a large-scale study testing 19 different factors, Campion, Medsker & Higgs (1993) found that self management and participation were the most predicative of effective group work (although the effects were still modest).

However, the causal mechanisms causing this facilitating effect can seem hazy and unspecified at times in the literature. Why exactly should increased employee involvement in decision making lead to enhanced creativity and innovation? What is the logic behind this connection?

A number of different hypotheses have been proposed concerning the possible causal link between participation and creativity. It has been proposed that increased degrees of freedom in work (e.g., Amabile, 2001), better utilization of employee diversity and knowledge (e.g., Latham et al., 1994; Jackson, 1996), minority dissent (e.g., De Dreu et al., 2001), and increased social support and organizational encouragement (e.g., Mumford & Gustafson, 1988; West et al., 1996; Kanter, 1983) are mediating factors between participation and creativity. Theories of organizational work environment (Amabile et al., 1996) and the creative climate in organizations (Ekvall, 1971; Ekvall, 1996) have used these, and other mediating factors (such as idea support) to explain why it is that participation apparently enhances the work environment or creative climate in organizations, thus improving the creative and innovative potential.

Unfortunately little empirical evidence for the various theories of group creativity exist (Kurtzberg & Amabile, 2001; Paulus et al., 1999). This also means that most of these mediating factors have not been directly tested in controlled studies where participation was implemented in organizations. Many of the mediating variables are thus only supported in a very small number of studies of participation, or not tested at all in direct relation to participation. Some of the support linking participation to creativity comes from studies using a social psychological or cognitive psychological laboratory approach, where naïve subjects are brought into the lab in ad hoc groups for direct testing of mediating variables. However, such research lacks ecological validity, in that a large number of factors influencing the relation between creativity and participation in real-world organizations are left out, not least the existence of formal and informal social

relations in the past and future, management relations, intra- and intergroup conflict, domain expertise and domain relevant knowledge. These factors may make generalizations beyond the laboratory problematic (Van Dyne & Saavedra, 1996).

Below we will review the empirical support for two general models for how the pdm may cause creativity. The first model concerns how participation may alter the work environment for creativity, and the second concerns how participation may influence the utilization of heterogeneity and diversity in the work group.

5. Theories of work environment/climate

5.1. Introduction

The creative climate of an organization or team has been studied most notably by Teresa M. Amabile and Göran Ekvall. The concept of 'climate' as used here is a very inclusive concept since it is based on psychometric instruments measuring (in the Ekvall tradition) "...the observed and recurring patterns of behaviour, attitudes, and feelings that characterise life in the organization" (e.g., Isaksen et al., 2001, p. 172) or (in the Amabile tradition) "...the work environment perceptions that can influence the creative work carried out in organizations" (Amabile, Conti, Coon, Lazenby, & Herron, 1996, p. 1155). These perceptions are related to organizational behaviour, values and norms and as such the 'climate' metaphor covers perceptions of many aspects of the work environment. It could be criticized for being a too inclusive and fuzzy, but that is not an issue we will explore any further in this article.

To assess the creative climate of organizations, Amabile has developed a questionnaire called 'KEYS' and Ekvall has developed 'The Creative Climate Questionnaire' (CCQ). These questionnaires measure a number of dimensions, which will be compared in the following.

The KEYS-scale includes the dimensions 'Encouragement of Creativity' (at organizational level, supervisory level and in the work group), Autonomy or Freedom, Resources, Pressures (Challenging Work and Workload Pressure respectively) and Organizational Impediments to Creativity (Amabile et al., 1996). The CCQ consists of the following ten dimensions: Challenge, Freedom, Idea Support, Trust/openness, Dynamism/liveliness, Playfulness/humour, Debates, Conflicts, Risk Taking, Idea Time (Ekvall, 1996).

Below the dimensions from KEYS and CCQ will be briefly described, and then an integration of the many dimensions and categories is suggested in an attempt show the extensive conceptual overlap between the two approaches, and to avoid a fragmented presentation of separate dimensions.

5.2. *Dimensions in the creative climate.*

A comparison of the dimensions of KEYS and CCQ reveals a significant conceptual overlap. Here we have attempted to narrow the dimensions down to a smaller number, in order to make some tentative interpretations of the relationship between participation and the creative climate. Three major categories of dimensions can be found when comparing the consensual overlap between the CCQ and KEYS: Freedom/autonomy; support; and resources. These dimensions do not cover all the dimensions listed by Ekvall and Amabile, but they include dimensions which are consensually agreed upon by the two approaches as being significantly related to the creative climate. Some of the dimensions left out of this categorization will be treated later in this review, including debate and conflict.

5.2.1. Freedom and autonomy

A major construct agreed upon by both KEYS and CCQ is freedom or autonomy. To Amabile, autonomy and freedom concerns “the day-to-day-conduct of the work and a sense of ownership and control over their own work and their own ideas” (Amabile et al., 1996, p. 1161). Ekvall agrees that freedom is important. His concept of freedom is defined as “the independence in behaviour exerted by the people in the organization” (Ekvall, 1996, p 149). To Ekvall, freedom is the opposite of passive rule-bound behaviour – i.e. active transcendence of or challenging rules (ibid.). Rule-bound behaviour and lack of autonomy causes the individuals and groups in the organization to ‘walk the same paths’ in problem solving. This mean trying the same problem solving strategies rather than to create new and better ways of understanding and solving the problem. The construct has gained some support from a study by Amabile and Gryskiewicz (1987). In interviews with 120 R&D scientists, 74% mentioned freedom as an important factor to creativity. Freedom can be linked to the construct of risk taking in that the ability to take risk obviously is dependent upon having the freedom to do so. According to Ekvall risk taking behaviour is to use experimentation as a source of information about new ideas rather than conducting a detailed analysis. Keywords in this behaviour is high tolerance of uncertainty and the ability to act quickly on opportunities (Ekvall, 1996). Amabile also supports the important role of encouragement of risk taking at all levels in the creative organization (Amabile et al., 1996). Amabile stresses that one of the reasons freedom and risk-taking is important is that they enable creative exploration to take place. Exploration in a work setting involves searching for problems and solutions and having the freedom to decide over, primarily, the means and ways one wants to carry out a creative exploration (but not necessarily freedom to decide ends or outcomes). This can be contrasted with a non-explorative approach to problem solving (an ‘algorithmic’ approach), which means that the steps and ways to solve the problem follows established rules and procedures – much like calculating by algorithms (Amabile, 1983).

The relationship between freedom and participation is conceptually straightforward, as a major effect of implementing participation in decision making is the increased freedom of a group or team to decide how to carry out it’s work (and in some cases also concerning outcomes). In turn, such freedom enables that the team can explore, experiment and try out new and potentially useful products and ways of working. However, although a clear

conceptual link exists, little empirical research has been carried out to explore the relationship between freedom, creativity and participation.

5.2.2. Support

A second major construct consensually agreed upon by Ekvall and Amabile, is support or encouragement for creativity. According to Amabile et al. (1996), this is the single most frequently mentioned dimension in the literature. Three levels of support are identified by Amabile: Organizational encouragement, supervisory encouragement, and work group encouragement. They consist of, among other things, open interactions, stimulation of diversity among the individuals of the team, mutual openness to and a constructive challenging of each others ideas along with shared commitment to the project (ibid.). It also includes an avoidance of criticism, that can inhibit idea generation or idea sharing, which can lead to non-creative solutions. In stead a fair and supportive evaluation of the generated new ideas is needed, along with rewarding and recognising creative behaviour. It is, though, important that the reward motivates intrinsically rather than extrinsically (or instrumentally) since the latter has been shown to have detrimental effects to creativity in experiments (ibid.). Two dimensions in the CCQ map quite well onto this explanation of encouragement. First, idea support is described as an attentive, encouraging and supportive way to receive new ideas in a constructive and positive spirit. The opposite of such a positive reception, is called 'the reflexive "no"' by Ekvall, which entails pointing out obstacles and putting forth automatic counterarguments (Ekvall, 1996). The second dimension is 'challenge' (termed 'challenge and involvement' in the Situational Outlook Questionnaire - SOQ - which is a later revised model of the CCQ for use in North America) which means the extent to which subjects and teams are given the opportunity to get involved in the daily operations, long-term goals, and visions of the organization. The challenged person is emotionally engaged in the project - he find meaning and joy in the work and invest much energy in the creative project. When there is a lack of challenge in the work, apathy, no interest in the work, indifference and alienation can be the result (Ekvall, 1996). The influence of the 'support' dimension upon creativity has a somewhat firm empirical basis. A good example of this is a study by West and Anderson (1996). They examined work group innovation in management teams in hospitals, and found that the single best predictor of work group innovation was team support.

The relationship between support/encouragement and participation in decision making is both conceptually and empirically unclear. Work group support and encouragement *may* be improved by implementing participation in decision making (through increased social interaction), but it is certainly not a linear causal relationship, and it will depend upon numerous other factors, such as the characteristics and personality of group members, training and resources provided, etc. It is quite possible that support/encouragement is a mediating factor in the relationship between participation and creativity. One could speculate that support and encouragement is a prerequisite for creativity, and that it therefore has the potential of hindering any positive effect participation may have on creativity, if it is in short demand in an group or organisation. However, this is somewhat

speculative, as the relationship between participation, support and creativity lacks empirical examination.

5.2.3. Resources

A final dimension of the creative climate consensually agreed upon by Amabile and Ekvall, is the need for resources. Adequate resources is thought to have two effects on creativity. First a practical one, that without any resources, any new projects will be too difficult to implement. Second, the allocation of resources can be perceived as a moral support to the project – that the project is worth working on (Amabile et al., 1996). In business, time is a resource that is frequently in short supply. Allocating enough time to projects is important to stimulate creativity. Indeed, 'Idea time' is a separate dimension in Ekvall's CCQ. Time to think about new ideas, to elaborate existing ideas, to discuss and experiment with ideas and impulses is very important, especially because creativity cannot be planned, scheduled and controlled (Ekvall, 1996). In relation to participation in decision making, two points need to be made in relation to resources. First, participation in decision making will allow a team greater control over how they utilize the resources they have been allocated (time, money etc.). Insofar as they have the sufficient knowledge and expertise, the resources may be used more effectively. However, and this is point number two, if the resources are scarce – for example if the organization implements participation in decision making with the purpose of cutting costs (e.g., by eliminating middle management staff), the reduction of resources may have a detrimental effect on creativity. Therefore, sufficient resources needs to be allocated to a team before participation in decision making can be expected to improve creativity.

Having reviewed the creative climate, and its possible relationship o participation, we will now look at a different line of research.

6. Theories of dissent, diversity and heterogeneity

Several theories have argued that the road from participation to creativity leads through taking advantage of a diverse or dissenting work force. An extensive amount of research has shown that minority dissent and group diversity can in fact be creativity enhancing, and a way to counter some of the possible negative consequences of group decision-making (e.g., the 'groupthink' phenomenon, (Janis, 1967), and tendency to conformity and seeking compliance (e.g., Baron, Kerr, & Miller, 1992)).

The argument revolves around taking advantage of individual differences in order to create new knowledge; people are to a great extent different: they have different knowledge, experiences, expertise, skills, traits, roles they take on in groups, and ways of doing things. Rather than viewing this diversity as a possible source of conflict and inefficient production (which it can be, see Jackson, 1996; De Dreu & De Vries, 1997), it is viewed as a source of unshared knowledge and characteristics that can be utilized in creativity and innovation.

Groups can be diverse in a number of ways (e.g., age, sex, skills, experience, values). A useful way of categorizing these kinds of diversity is as either *task-related* (e.g., department and unit membership, formal credentials, education level, physical skills and abilities, job experience) or *relations oriented* (gender, race, ethnicity, age, national origin, social status, attitudes, values, personality) diversity (Jackson, 1996).

At a group level the argument that avoiding too much conformity and utilizing individual differences will lead to creativity and innovation is typically examined by looking at interaction patterns in the group³. E.g., do the group attempt to reach a common consensus by ignoring minorities – or is the opposite the case? Minority dissent in groups is an important area of research in this connection. Minority dissent occurs when a minority in a group publicly opposes the beliefs, attitudes, ideas, procedures, or policies assumed by the majority of the group (e.g., De Dreu et al., 2001; Nemeth & Kwan, 1987; Nemeth, 1986). De Dreu & West (2001) found that minority dissent predicted innovation in teams only when the teams had high levels of participation in decision making as well. It was concluded that minority dissent stimulates creativity and divergent thought, which, through participation, manifest as innovation.

A long list of studies have found that diversity in groups increases performance on creative decision-making tasks (see Jackson, 1996 for a brief review) and innovation (West et al., 1996; Campion, Medsker, & Higgs, 1993). Although there have been inconsistent findings, these can probably be attributed to the fact the studies used relations-oriented diversity, rather than task-related diversity. As Jehn et al. (1999, p. 742) has argued: “These inconsistent findings should not be all that surprising. No theory suggest that a workgroup’s diversity on outward personal characteristics such as race and gender should have benefits except to the extent that diversity creates other diversity in the workgroup, such as diversity of information or perspective. [...]. Even when workgroups do possess that ‘other’ diversity (e.g., information or perspective), performance benefits should be expected only to the extent that workgroup members successfully manage the difficulties of interacting effectively with dissimilar others [...]”.

The fact that task-related diversity seems to be clearly related to creativity and innovation poses two questions for the present review: Why would group diversity and minority dissent lead to creativity?; and what (if any) part does participation play in that connection?

There are two different kinds of explanation of why task-related diversity would lead to creativity and innovation. The first could be termed the *knowledge complementarity hypothesis*. It simply states that pooling knowledge and skills from diverse fields related to the area of interest will increase group performance (e.g., Latham et al., 1994). This line of

³ The argument can be carried out at an organizational level as well. Here the argument becomes one of avoiding too much centralization and formalisation in organizations, in order to bring out the creative potential hidden in individual differences (e.g., Ekvall, 1996).

argumentation is not without precedent in creativity literature, but some researchers have also argued for the opposite relationship between creativity and knowledge (i.e., that more knowledge inhibits creativity). The problem is that creativity is a very special form of performance that creates *novel* products, and the argument that the generation of a product is knowledge-based opens up for the discussion of whether a knowledge-based product can be 'creative'. If creativity is viewed as radical novelty without any links to the past, knowledge-driven processes can easily be seen to concern something else than creativity. However, as modern creativity theories are increasingly acknowledging (e.g., Perkins, 1988; Ward, Smith, & Vaid, 1997; Weisberg, 1986), creativity does not come into being out of nothing ('ex nihilo'), but is grounded in knowledge of the world and its possibilities. Therefore knowledge is a necessary component of creativity, and also one of which more is better in creativity. This is not to say that activating certain information or knowledge components cannot temporarily inhibit the production of novelty, as cognitive theories of functional fixedness (Duncker, 1945) and mental ruts (Smith, 1995a; Smith, 1995b; Smith & Blankenship, 1991; Smith & Vela, 1991; Smith, Ward, & Schumacher, 1993) have argued. It is simply stating that having knowledge in and of itself is a vital and necessary component of creativity.

This appreciation of knowledge has led to an increased recognition of analogical transfer as a part of creativity. Finding analogous solutions to problems (e.g., by being inspired) in other domains is an inherently creative process, that can create novel and useful products (Gick & Holyoak, 1980; Holyoak & Thagard, 1995; Holyoak & Thagard, 1997). It is not less creative just because the source analog is derived from another domain. The same basic argument goes for knowledge in groups; diverse knowledge increases the likelihood of creativity through distant analogies across domains.

The second kind of explanation of why diversity would lead to creativity concerns *social interaction* in the group. Studies of minority dissent suggests that a dissenting opinion in a group will give rise to sense-making attempts of why someone would think that way. This in turn leads to the dissemination, exploration and taking into account of diverse perspectives and new ways of looking at things (Vissers et al., 2002).

Of course these two kinds of explanation could be said to be closely related; one focussing on diverse knowledge pooling - the other the social interaction effects of pooled diverse knowledge.

The question is now: how is task-related diversity related to participation? West (1990; West et al., 1996) argued that whereas diversity primarily increases the quality of creativity and innovations, participation in decision making primarily increases the quantity of innovations, through easing implementation. In two studies De Dreu & West (2001) found that an interaction effect of pdm and minority dissent was predicative of work group innovation. Furthermore, participation alone was only a significant predictor in one of the studies. This *could* be interpreted as support for the above hypothesis that participation is necessary for the utilization of the diverse opinions brought out through minority dissent (although other interpretations are certainly possible). In other words, pdm is not thought to be related to the early stages of the creative process except under

very special circumstances (e.g., the continued sharing and attending to one another's ideas) (West, 2002). This notion lends support from laboratory research on brainstorming and idea generation which has consistently shown that nominal groups (aggregated scores for individuals working alone) outperform groups where individuals brainstorm together (Diehl & Stroebe, 1987; Paulus, Larey, & Dzindolet, 2001). This has led researchers such as West (2002) to conclude that one should be wary of assuming a direct link between participation and creativity. However, it should be noted that some studies have found that participation alone in some cases have been found to predict creativity or work group innovation (e.g., West et al., 1996; De Dreu et al., 2001, study 1).

A number of researchers have pointed out that group processes resting on diversity must be managed carefully. Shapiro (2000) noted that if different employees are not involved equally, the program can struggle. He called for a different management approach to dealing with diversity in organizations. Stasser & Titus (1987) argued that much of discussion in groups is devoted to already-shared information. Only under certain circumstances do the discussions revolve around the unshared knowledge of the participants. Argote, Gruenfeld & Naquin (2001) reviewed the literature on what may influence whether unshared information will be shared in group processes, and found that "...information is most likely to be shared in groups when: (a) group members are not burdened with exceptionally high information load, (b) diversity of opinion exists in the group, (c) group members are perceived as having special expertise, (d) groups are relatively small in size, and (e) tasks are perceived as having a demonstrably correct answer such as making a diagnosis." (Argote et al., 2001, p. 381).

Even though researchers examining team diversity have questioned whether pdm enhances the early stages of the creative process, most researchers view pdm as an important component for increasing innovation implementation. Participation in decision making leads to greater commitment to group decisions (e.g., Steel & Lloyd, 1988), and lower resistance to change, which in turn, increases the likelihood of innovations being implemented. The sharing of information, increased social interrelatedness, and influence on the process characteristic of pdm leads to greater commitment to and investment in group decisions (King, Anderson, & West, 1991; Kanter, 1983).

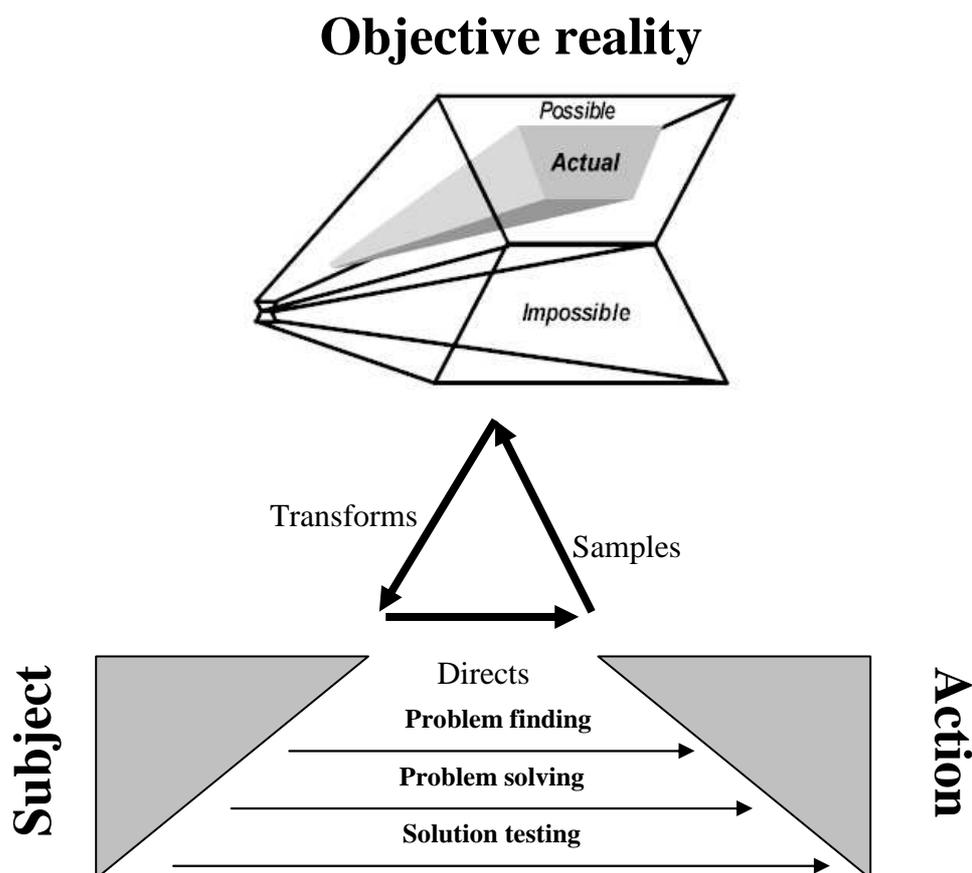
In conclusion, diversity in groups seems to lead reliably to group creativity and innovation. But the diversity must be task-related, and must be managed well. Participation in decision making is necessary for implementing the creative ideas generated in groups of diverse participants. However, there is some doubt about whether pdm in and of itself leads to enhanced creativity in group discussions.

7. A theory of participation in decision making and creativity in work groups

Above we have seen that participation in decision making has been linked to creativity and/or innovation through freedom and the ability to explore, support, task-related

diversity, and commitment. What is needed is a theory that could tie these loose mediating variables together in a theory of the relationship between pdm and creativity in work groups. Simply stating a list of mediating variables does not constitute a theory. We will now outline an ecological cognitive theory of creativity, and attempt to show that it has the capability of explaining many of the mediating variables that has been found between pdm and creativity.

The theory is called 'the creative cycle' (Christensen, 2002), and it explains creativity as a cyclical process between cognition and reality, mediated by creative action. In that respect it follows in the tradition of ecological cognitive theory (Neisser, 1976; Barsalou, 1999) and Activity Theory (Vygotskij, 1995). However, such a framework has typically been used to explain cognitive phenomena such as perception and learning (i.e., where the individual does not to any significant extent alter the world) rather than creativity (where that is necessarily the case). When it comes to processes where the subjects alters the real-world (i.e., brings possibilities of the world into being) some remarks are merited as to what constitutes cognition, activity and ontology. The creative cycle appears as follows:



The model is briefly reviewed here – for a more thorough explanation, refer to Christensen (2002). Basically creativity is viewed as a directed and active search in the real-world. In this connection the real-world is not limited to what is presently and objectively (i.e., positively) existing in the world (i.e., objects and past events), but is extended to the objective although not-existing possibilities and impossibilities of this world. In that sense,

creative search action can be said to be *sampling* these possibilities and impossibilities, even though the very same processes are generative, in the sense that they involve recombining cognitive elements, such as entities, events, and categories. Such an explanation of creativity as search in a space of possibilities and impossibilities follow in the tradition of information processing theories of problem solving (Newell & Simon, 1972; Perkins, 1981; Boden, 1990; Ohlsson, 1992; Knoblich, Ohlsson, Haider, & Rhenius, 1999). But these theories generally view the search space as being merely an internal mental problem space, rather than the possibilities and impossibilities of the real-world – thereby creating a purely constructivist theory. The present explanation places possibilities and impossibilities as real-world qualities, thereby creating a synthesis between realist and constructivist theories of creativity, mediated by creative search activity.

There are various kinds of creative search activity, including problem finding, problem solving, and solution testing activities. Activity is not limited to 'external' behavioural search activities (i.e., behaviour that actualizes – brings possibilities into being), but include cognitive simulations of variations of the real-world as well.

The model has been used to explain individual creativity, but has not been yet been used to explain creativity in groups. As such it has been used to explain characteristics of the creative process, but not as an explanation of the implementation stages of innovation. However, in connection with pdm these factors need to be taken into account as well.

7.1. Participation in decision making in the creative cycle

If creativity is an active search in a space of possibilities for problems and solutions, then the question becomes: how can participation in decision making contribute to this process. Below I will look at three ways, all supported by the theoretical and empirical literature, in which pdm can help creativity in work group innovation in such a model.

7.1.1. Participation in decision making helps utilize diversity through integration

According to the creative cycle, having knowledge (and skills) of the world, and it's objective possibilities and impossibilities will help the creative process, as more possible variations of the world can be simulated and attempted, in the search for novel and useful products. Having task-related diversity in work teams is one way to improve the quality of the knowledge and skills which are used to search for creative solutions. However, task-related diversity in teams needs to be integrated; solutions and unshared knowledge needs to be discussed and evaluated; knowledge needs to be distributed through social interaction and communication. This need for integration in order for diversity to fulfil it's potential for enhancing the quality of creative solutions can come from participation in decision making. At least under certain circumstances pdm can lead to more discussion and information sharing of unshared information.

Therefore, when task-related diversity needs to be shared between individuals in a group, pdm can perform an integrative role, where the social interrelatedness of the group

increases, along with the exchange of information. Without integration, task-related diversity is not shared and utilized. This explanation places a heavy emphasis upon the social integrative function of pdm⁴ (communication and interpersonal relationships), and focuses less on the decision making abilities of the group (see e.g., West, 2002). Social integration must not be misunderstood to mean anything along the lines of 'friendship' or other positive connotations of close social interrelatedness, but is purely a measure of the degree of sharing information and skills in the group. This may entail constructive conflict as well, as research on minority dissent has shown (e.g., De Dreu et al., 2001). The IDE (Industrial Democracy in Europe research group) study found that higher levels of participation was related to higher frequencies of disagreement. Wilpert (1998) explains this with the increased articulation of different actors and parties interests in the participatory decision making process. This articulation of interests also increases the chances that *different* interests are brought up in discussion, resulting in more conflict among stakeholders. This conflict need, however, not be in opposition to creativity. Nighingale (in Wilpert, 1998) has established that a relation between participation and active problem solving strategies that is not about use of force or ignoring the conflict. All together participative organizations experience more disagreement as well as better problem solving. This suggests that the participative organization experiences more 'functional' (what is here referred to as task-related) conflicts. But one must be aware that diversity must be managed well to avoid the potential negative effects of personal (non-task-related) conflicts. Open discussions will in many (if not most) cases result from implementing participation in decision making. IDE has developed a taxonomy over influence (table 1). This taxonomy is used to define the extend of participation, from no participation at all (level 1) to full autonomy (level 6) (Heller, 1998). Open debates becomes an almost integral aspect of participation at the higher levels of participation (level 4 and 5). At the other end of the scale, open debates are unlikely to occur, or will at least be 'inauthentic', as it will avoid genuine influence-sharing.

1. I am not involved at all
2. I am informed about the matter beforehand
3. I can give my opinion
4. My opinion is taken into account
5. I take part with equal weight
6. I decide on my own

Table 1: The IDE-taxonomy, from Heller (1998)

The role of participation in this connection is, thus, to increase exchange of unshared task-related information through integrative processes. One could call this a 'theory of cognitive exchange'. It is clear that open discussions, task-related conflicts, support for innovation, and increased social interrelatedness all help this integration.

As mentioned, integrative processes in the work group may not be a direct consequence of pdm. The ability to participate in decision making *can* lead to increased social interaction, open discussions, and support for innovation. But poor intra-group management of this newfound ability (e.g., due to lack of training and guidance) can hinder these effects in

⁴ This is similar to what was examined by West & Anderson (1996). They used a scale to measure 'participation in the team', which included questions relating to the social interrelatedness and communication in the team – rather than questions of their capability to make decisions.

taking place, as can lack of resources (e.g., cases where pdm is implemented in order to cut costs).

The cognitive-exchange theory predicts that given high work group integration (which *can*, at least under certain circumstances, be improved by pdm), a significant amount of task-related diversity in the group will lead to a high quality (but not necessarily a high quantity) of innovations.

7.1.2. Participation in decision making increases freedom and creative search activity

When the creative process is viewed as an active search for novel and useful products in the possibilities and impossibilities of the real-world, an important question becomes what constrains this search. Creativity becomes a matter of exploring, experimenting, and searching the possibilities of the world, but since we do not have direct access to these possibilities, we need to generate and simulate variations of the real-world, in an attempt to throw light upon them. This cognitive simulation process is constrained by a number of things; the purpose of the search, the cognitive elements you have available, the search strategy you are employing, and constraints in the environment (see Christensen, 2002, for a more complete discussion of these types of constraints).

An additional constraint applies in work team settings. It is hypothesized that subjects in a work setting will only attack creative problems when they have the freedom to do so. 'Freedom' in this context means that they have the authority and control to attack the problem, and to implement any solution they may come up with. Freedom also implies that subjects are able to move around a search space (i.e., it is considered a legitimate part of their work), in order to find creative problems and solutions. It is an empirical question whether employee freedom is causally related to creative search activity in this way and some support for this hypothesis has been documented by Amabile & Grysiewicz (1987) who found that 'freedom' was considered the most important work environmental variable for creativity in interviews with 120 R&D scientists. Several researchers have similarly noted that freedom seem to be essential for creativity (Johnson-Laird, 1988; Ekvall, 1996; Amabile, 2001). Amabile (e.g., Amabile, 2001) has argued that it is primarily freedom of *how* the work is carried out (i.e., of process) that is important in creativity, rather than of what the creative process is directed towards.

How is freedom related to pdm? By allowing employees to participate in decision making, problem solving and other areas traditionally viewed as 'managerial tasks' new possibilities open up. One could say that pdm comes with the ability to change things. Guidelines and procedures are no longer merely something laid down by management, but rather subject to discussion and change. And it is quite possible, and even expected, for employees to experiment, discuss and explore both old and new approaches to their work. The resulting learning, problem solving and developing potential is one of the most sought after aspects of implementing participation in organizations. By allowing the

individual to participate in, and exert his own influence on, his own daily work life to a greater extent, new actions become possible, and freedom increases.

A consequence of this capability for decision-making is the awareness that implementation of novel approaches into their own work process no longer requires management approval (as long as they can be kept within existing resources, and structural requirements, such as organizational regulations for work procedures).

Being given the freedom and responsibility of a greater part of their daily work life, comes with the awareness that any problems that arise are theirs to solve. This includes any problems they can pinpoint themselves. Increased capability for decision making can thus lead to increased innovation, and the tendency to notice, create and put into use novel and useful products and procedures that would have been left alone, had the capability not been there. In this way the freedom to implement solutions sparks off problem finding activities, where the subject notices problems in his daily work life, and then attempts to solve them creatively. This implies the tacit dimension of problem finding in pdm. As individuals move around in their work spaces, the freedom to change routines and structures will lead to noticing problems, and ways of doing things better.

It should be noted here that the particulars of the organisation of the pdm group has important implications for the ability to implement solutions. For example, Quality Circles established to find solutions to problems, may end their creative process with a solution that have to be implemented across groups in the organization - a situation demanding managerial and co-worker support, and requiring persuasion. But at least as far as autonomous groups that create with the purpose of implementation into their own daily work life is concerned, the above consequences seem valid.

Behind the theory that freedom will increase creative search activity is an assumption that could be summarized as follows: When individuals are given freedom and control under reasonable conditions they will attempt to utilize expertise and knowledge to improve their own situation. This goes for creativity and learning alike. 'Reasonable conditions' include resources (such as time and money), but also organizational and team support in general. It is important to note that since 'freedom' is linked to the objective search space (the possibilities of the real-world), you are not merely altering the 'mind-sets' of the employees by giving them freedom. Rather you are actually providing them with the opportunity for exploring and experimenting with real-world possibilities in the search for novel and useful products. This, in turn, requires that the freedom and control needs to be genuine freedom and control, and not a management fad or play of words. These cautions signal that there are many ways of implementing pdm that may not actually enhance employee freedom and thus enhance creative search activity. For example, if autonomous work teams are implemented in order to reduce middle management costs, and thus followed by a reduction of resources to the individual team, enhanced creative search activity should not necessarily be expected to increase.

The theory could be referred to as the 'freedom for creative search' hypothesis. The theory predicts that increasing individual freedom and control will increase creative search activity (both problem solving, problem finding and implementation). This could be tested by looking at how much time is spent on solving problems and finding problems respectively (e.g., through exploration, and experimentation), and the number of creative problems and solutions that are handled by the group. It could be argued that 'creative search activity' in certain respects resembles some of the factors that creative climate theories list as *mediating* variables. 'Dynamism/liveliness' and 'Playfulness/humor' could be argued to be aspects of creative search activity, rather than being mediator variables that causes creativity. Due to the methodology of the theories of the creative climate, they can only document correlational, and not causal, relations between the mediating factors and creativity measures. The argument here is that perhaps these measures are actually not mediating factors, but rather a kind of effect measure of creativity.

Freedom can be increased by participation in decision making, given the availability of reasonable resources and support. This in turn increases the quantity (but not necessarily quality) of creative products generated. The amount of these creative products that are implemented (and thus lead to more work group innovations) will depend on factors such as the quality of the products, work team support, commitment to group decisions, and the availability of resources.

The theory predicts that insofar as participation in decision making leads to more freedom and control for a group, this will positively benefit the creative processes in the group. Some researchers have, on the basis of brainstorming research argued against a linear relationship between pdm and creativity (e.g., De Dreu et al., 2001; West, 2002). Laboratory research on brainstorming has shown that individuals working together are outperformed by nominal groups working alone (e.g., Paulus et al., 1999). It is, however, problematic to generalize from the comparison of individuals and groups in brainstorming sessions, to the creative process in general. As argued above, such experiments may not be representative of either real-world work groups or creative processes in general. The present model points out that creativity is much more than brainstorming sessions. It is about exploring and experimenting with the real-world, and bringing possibilities into being. When creativity is considered a search for problems and solutions, freedom becomes a creativity enhancer, that can create more search activity, as well as a larger search space. Participating in decision making can generate freedom, and thus creative search activity and a greater quantity of creative products, even though the quality may depend on other things as well (such as the integration and exchange of knowledge).

7.1.3. Participation in decision making increases commitment and responsibility to group decisions and implementations.

The creative cycle was created to deal with creativity, and does not concern the implementing stages of innovation. However, in relation to work group creativity, an important part of the process involves the implementation of innovation in the work

group. Some researchers have argued that a primary benefit of pdm in relation to creativity is that pdm enhances commitment and responsibility to team decisions, and reduces resistance to change (King et al., 1991; West et al., 1996). These notions builds on classical research in social and industrial psychology (see West & Anderson, 1996, for a brief review). This finding has led researchers to argue that a primary function of pdm in relation to creativity is to ensure that creative products are successfully implemented (e.g., West, 2002). In this respect, pdm does not influence creative processes, but rather ensures that creative products are successfully implemented, and possibly that *more* creative products are implemented.

7.2. Hypotheses derived from participation in the creative cycle

Above we have sketched three different ways participation may influence creativity: through cognitive-exchange, through freedom for creative activity, and through commitment to group decisions. These explanatory models can all be grounded in the overall theory of the creative process called the 'creative cycle'. What should be clear from the above discussions is that the three explanatory models each influence creativity in different ways. In that respect they each lead to different kinds of 'outcome variables'. The cognitive-exchange theory holds that integration and task-related diversity together leads to an increased quality of creative products (but not necessarily quantity of creative products, or an increase of the quality of implemented innovations). 'Freedom for creative search' states that increased freedom leads to increased search activity, as well as an enlarged problem space to search. This, in turn, leads to an increase in the quantity of creative products (but not necessarily increased quality - or increased quantity of innovations). And finally, commitment to group decisions leads to an increase in the quantity of implemented innovations (but not necessarily an increase in creative search activity, of the number or quality of creative products generated).

The primary finding from this integrative review is thus that there are three different ways participation in decision making may influence the creative process, and each of these explanations will have a different impact on different outcome variables (creative search activity, creative products and implemented innovations). See blow for a sketch.

Participation in decision making				Outcome				
Freedom	Integration	Diversity	Commitment /support	Search activity	Creative product		Innovations	
					Quality	Quantity	Quality	Quantity
+				+		+		
	+	+			+			
	+	-			-			
	-	+			-			
			+					+
+	+	+	+	+	+	+	+	+

An open question concerns possible interaction effects between the three different ways participation in decision making may influence creativity. This type of explanation opens up for making further hypotheses of what would happen if various constellations of mediating factors were to occur. A simple hypothesis would for example be that only when commitment to group processes exist will an increase in freedom lead to an increase in the quantity of implemented innovations. However, this is not the place to completely outline all possible interaction effects between these variables. Future research will have to make predictions of specific interaction effects, and test their validity. For now we will settle with the overall hypothesis, that when all three types of mediating factors are present (freedom, integration, task-related diversity, commitment to group processes) only then all of the outcome variables will positively affected (creative search activity, quality and quantity of creative products, quality and quantity of implemented innovations). If one or more of the mediating factors does not result from participation in decision making, one or more of the outcome variables will not be positively affected.

8. Conclusions and future research

Organizational psychological literature has established that participation in decision making is positively related to creativity in work groups. Several causal explanations for this relationship have been offered. The present integrative review looked at two such explanations (factors influencing the creative climate, and the relationship with work group diversity and dissent). When the findings from these areas of investigation were combined and placed into an ecological cognitive theoretical framework for the explanation of creativity ('the creative cycle'), a coherent theory of the relationship between participation and creativity could be put forth. This coherent framework lists three different ways participation in decision making can influence aspects of the creative process and outcomes. First, *cognitive exchange* theory predicts that given high work group integration (which *can*, at least under certain circumstances, be improved by pdm), a significant amount of task-related diversity in the group will lead to a high quality (but not necessarily a high quantity) of innovations. Second, *freedom for creative search* predicts

that insofar as participation in decision making leads to more freedom and control for a group, this will positively benefit the creative processes in the group. This occurs as the objective and legitimate search space for the group is enlarged, and the creative search activity (exploration and experimentation; problem finding, problem solving, solution testing activity) of the individuals are positively affected. This, in turn, will lead to a greater quantity (but not necessarily quality) of creative products. Third, *commitment to decision making* predicts that insofar as participation leads to greater commitment to group decisions, a greater quantity of work group innovations can be expected, as more of the creative products are implemented.

A major prediction from the present review is that each of the three low level theories predicts the positive aspects of different outcome variables, all associated with creativity. Only when all three (integration and diversity, freedom, and commitment) are present in a given organizational implementation of participation in decision making, can it be expected that creative search activity, and the quality and quantity of creative products and innovations are all positively affected. Future research will have to determine what kind of interaction effects are to be expected given different combinations of the presence of diversity and integration, freedom, and commitment.

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