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Idea Exchange and Shared Understanding: Tools Stimulating Thought and Conveying Ideas

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Abstract: The topic of this paper is the use of sketching when exchanging shape visions. Attaining a shared understanding in a collaborative design project is examined. The interaction acts of an industrial design team at a renowned design firm in Stockholm are analyzed, as well as where the idea development session is situated. The interaction in itself could function as the prevalent means of describing and mediating creative idea development in groups. The basic intent of bringing together individuals who hold divergent notions is the creative tension this meeting may bring forth. There seems to be an inevitable gap between designers' ways of forming and expressing opinions concerning aesthetic ideas and their use of verbal language. The concepts 'verbal overshadowing' and 'figurative arguing' are considered, as well as 'the power of the board'. These phenomena influence the session's creative potential. The interpretation of the different types of sketches used by the team is focused on, as a means of understanding the significance of each type and the impact on idea development. Based on this study, several recommendations for establishing effective idea exchange and supporting evolving shared understanding (i.e., a group idea) are presented.

Keywords: Sketching, Descriptive Language, Interpretation, and Group Dynamics

Introduction

DEVELOPING IDEAS IS complex. In creating new design solutions, several aspects and knowledge domains need to be considered. In industrial design, these processes make use of different group set-ups, depending on what is relevant at that particular phase in the idea development.¹ Creative group sessions demand a specific structure and interactants' improvisational attitudes (see below), as well as facilitating and supportive adaptability. Creative idea development using group settings also has to take several problems regarding social interaction and group dynamics into consideration. Examples include groupthink and conformity press.²

Background

This paper presents components of a research project carried out in three authentic, actual idea development sessions at two industrial design firms in Stockholm. One of these sessions is analyzed in this paper. The design firm in this paper stated that it uses brainstorming as a method in its endeavor to design products suited to customers' needs. The number of parti-

¹ Thompson, L. & Choi, S. H. (Eds.) (2006) *Creativity and innovation in organizational teams*. New Jersey: Lawrence Erlbaum.

² Paulus, P. B., & Nijstad, B. A. (Eds.) (2003) *Group creativity: Innovation through collaboration*. New York: Oxford University Press.

Participants, the duration of a session (often about three hours), the formal status of the session, and the use of different creative techniques differs from one design project to another. The analyzed session lasted for about two hours, and was carried out by five individuals. The session was held in a small, traditionally furnished conference room. The participants were a mix of employees of the firm and hired experts or consultants, all depending on the subject field.

Methods

The development of ideas and social interaction in a group setting are complex phenomena. A diagrammatic notational method (Figure 1), a tool for making these kinds of complex processes visual while at the same time supporting the analysis process, has been developed.³

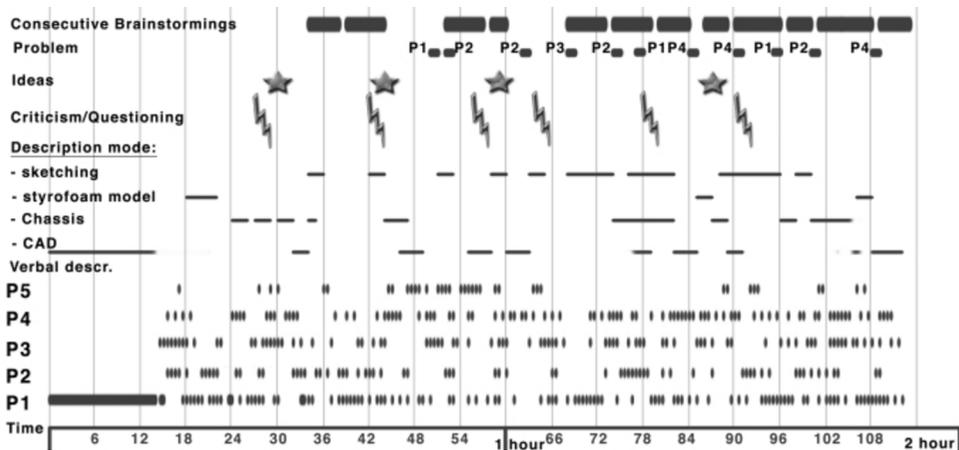


Figure 1: Diagrammatic Notation of Idea Development and Descriptive Language during a Two Hour Session with Five Participants

The diagram above describes one idea development session under scrutiny. Five participants (P), including the session leader, constituted this session. The session used physical tools for descriptions. Examples included a sketchpad, a model made of Styrofoam, a contestants’ product (chassis), and the participants’ own mock-up in 3D-graphics (CAD). The idea development could be divided into five phases. In the first phase (15 minutes), the session leader presented different scenarios and gave an overview of topical market segments. The second phase lasted for about an hour, with divergent ad-lib conversation. During this second phase, certain questions arose simultaneously, with increasing questioning or even criticism of the participants’ ideas. Shared understandings of different aspects began to emerge during the third phase. In the fourth phase, the session leader start sketching on the sketchpad. In the fifth phase, consecutive short periods of brainstorming took place, between three to six minutes each, and sometimes those short strings of idea development were interwoven.

³ Olsson, B. *Descriptive languages in and for creative practice: Idea development during group sessions*. Doctoral Dissertation 1651-4238; 68. 2008 (Mälardalen University Press, Västerås, Sweden).

Dialogue intensity tends to decrease when sketches are created. At some moments, the session is completely silent.

The whole brainstorming session was captured on digital video for transcription and analysis. A multimodal approach is used to analyze the material captured. In this study, the interpretation of analyzed materials is understood as a variety of sights. Inspiration for this approach comes from Gillian Rose's effort highlighting issues concerning the interpretation of visual materials.⁴

In writing this paper as well as investigating this material, we also reflected on the differences in our respective knowledge backgrounds. We had two different focuses in this material. They can be described in short as dialog and creative interaction in groups and visual materials supporting idea development in groups. We decided to use both, which we felt offered a deeper understanding when analyzing this particular material.

Theoretical Perspectives

This section presents different aspects that we believe are critical to group creativity and non-verbal description language.

On Group Creativity

In our view of creativity, interaction is a central feature. We regard creative outcome as something that emerges out of social interaction, rather than being accomplished through a single individual's cognitive capabilities. As such, studies of group creativity should focus more on the qualities of the interaction than on the external control of the interaction⁵. Furthermore, in our perspective, creativity is an unpredictable and, at the same time, comprehensible process. In line with Glăveanu, we hold that creativity has a strong social basis, as it emerges primarily through dialogical interaction in a relationship. Thus, new questions are raised in dialogical interaction. It is in this meeting that new combinations are found and novelties could be critically evaluated.⁶

On Social Interaction

A fundamental incentive to organizing work tasks in group settings is the positive effect that occurs when people with different acting and thinking styles are allowed to interact. Uniform thinking styles and the striving for consensus are strong contributors to groupthink and its negative influence on group performance.⁷ Since manifoldness and difference are foundationstones in creativity, destructive groupthink needs to be counteracted by allowing each group

⁴ Rose, G. 2007, *Visual methodologies- An introduction to the Interpretation of Visual Materials*, second edition, Sage, London, pp. 30-31.

⁵ Backström, T., and Olsson, B. K. Kaikaku - a complement to emergence based development. Paper presented at The First International Conference on Design Creativity, December, 2010, Kobe, Japan.

⁶ Glăveanu, V. P. 2010, *Paradigms in the study of creativity: Introducing the perspective of cultural psychology*. *New Ideas in Psychology* pp. 28, 79-93.

⁷ Janis, I. L. *Victims of Groupthink*, 1972, Houghton Mifflin, Boston; Wittenbaum, et al. *The Functional perspective as a lens for understanding groups*, *Small Group Research*, 35(17), 2004.

member's deviant ideas and acting-out to meet the resistance social interaction brings about (in other words, having to meet other perspectives and ideas).⁸

On Group Ideas

Dialogue includes both giving and taking between the group members. Members need to actively express their ideas, make others understand their ideas, actively listen, and try to understand others' ideas. For the purpose of making the group interaction eventuate into creative results, all group members have to be present in whatever is going on, aiming their focus on whatever emerges out of the social interaction. The group interaction constantly creates outcomes that gradually develop into a shared understanding of what is created.

By the early 20th century, Follett had phrased a perspective that shifted focus from individual to group level. She did so with the assistance of the concepts *circular response* and *group idea*. This perspective places the emergent ideas in between group members. The group idea is not a result of an addition process; rather, it is developed through and in between all group members' mutual interaction.⁹

Acting and reacting is a function of the relationship between the individuals and their environment. Consequently, the relationship is an interaction structure. As such, each group member's acting must be understood in relation to this structure. In this perspective, every initiative contributes to the group's endeavor. If the group member adopts this view or attitude regarding his or her group membership, all acting becomes constituting parts of the group dialogue.¹⁰

⁸ Olsson, B. *Descriptive languages in and for creative practice: Idea development during group sessions*. Doctoral Dissertation 1651-4238; 68. 2008 (Mälardalen University Press, Västerås, Sweden).

⁹ Follett, M. P. 1918, *The new state: Group organization, the solution of popular government*. New York: Longman, Green and Co.

¹⁰ Olsson, B. 2007, *Languages for creative interaction: descriptive language in heterogeneous groups*. Proceedings of The 10th European Conference on Creativity and Innovation, ECCI-X. Copenhagen 14 – 17 October, 2007.

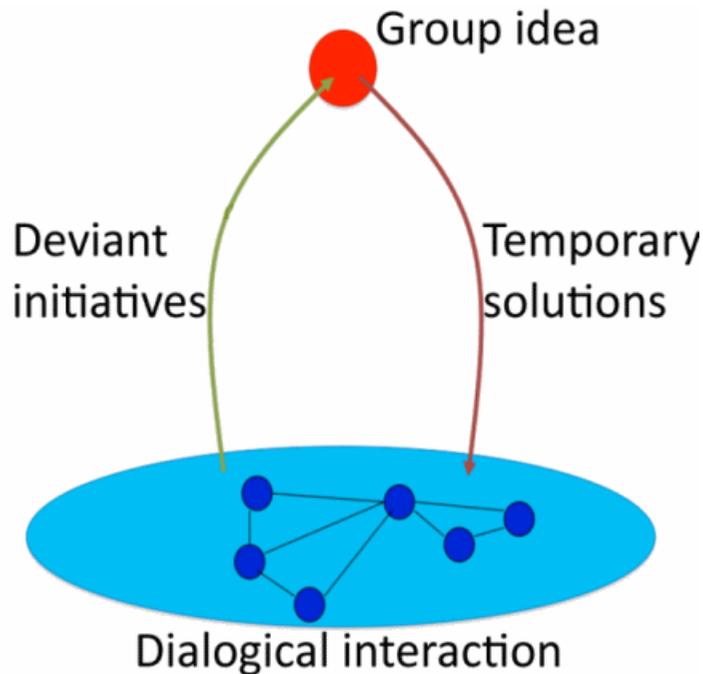


Figure 2: Haken's (1996) model processed in accordance with our view on group creativity.

Figure 2 describes idea development as circular causality where the actors' interactions cause the idea and the evolved temporal solutions entitle the interactions.¹¹ This view implies that creative idea development processes are essentially unplanned since they result in emerging content previously unknown. This characteristic of group dynamics requests interactants to adopt an improvisational attitude. The creative process suggests improvisational attitude for people involved, as a prerequisites for their work, and the importance of sensitivity towards each unique process sooner than controlling the outcomes.

On Temporary Group Interaction

Models of social flow describe human interaction as temporally organized and assert that varying rhythm and cycles underlie different group processes.¹² Reid & Reed¹³ describe

¹¹ Haken, H. *Principles of brain functioning: A synergetic approach to brain activity, behavior and cognition*. Springer, Berlin, 1996.

¹² Kelly, J. R. Entrainment in individual and group behavior. In J. E. McGrath (Ed.), *The social psychology of time: New perspectives* (pp.89-110). Newbury Park, CA: Sage, 1988; McGrath, J. E., & Kelly, J. R. (1986). *Time and human interaction: Toward a social psychology of time*, Guilford Press, New York; McGrath, J. E., Kelly, J. R., & Machatka, D. E. (1984). The social psychology of time: Entrainment of behavior in social and organizational settings. In Reid, F. J. M., & Reed, S. Cognitive entrainment in engineering design teams. *Small group research vol. 31 no. 3*, pp. 354-382, 2000.

¹³ Reid, F. J. M., & Reed, S. (2000). Cognitive entrainment in engineering design teams. *Small group research vol. 31 no. 3*, pp. 354-382.

how cycles of turn-taking of verbal descriptions are interwoven with periods of reasoning based on either figurative or conceptual arguing. They maintain that the group dialogue's cognitive content conducts the interaction and sets the rate in the shifting pattern between figurative and conceptual modality, respectively. Furthermore, the cognitive content also conducts the incorporation of one or the other modality. The pulsatory shift between cognitive (i.e. conceptual) and behavioral (i.e. figurative) models constitutes the group interaction's temporal character. However, there is a lack of suggestions or recommendations as to how these kinds of group work should be organized and performed in order to be efficient. We strive to take the results from this body of research into consideration, as well as the results from our own studies, when we present our recommendations for efficient idea development and design through group dialogue.

On Group Dialogue

Goldschmidt¹⁴ has studied so-called "think-aloud-protocols" from the analysis of design groups and located regular shifting patterns in designers' interactions. Group interaction shifts between two modalities, a figurative and a conceptual modality. The figurative interaction is essentially composed of descriptive images, sketching, and representative descriptions, such as gesticulation. The conceptual modality is essentially built on verbal interaction and conceptual descriptions. Several statements from the one modality followed by several statements from the other modality constitute a general shifting pattern. For example, an argument built on sketching or gestures is followed up by verbal arguing. It is particularly interesting that the shift between modalities was faster with experienced designers, specifically during periods when new ideas were generated, as Goldschmidt noted.¹⁵

On Figurative Arguing

In their studies of protocols from design sessions, Cross, Christiaans, & Dorst¹⁶ found that one individual often established something the authors termed "megaturns". When a group member contributed a crucial aspect or a part of a solution, he or she foremost used figurative arguing by pointing towards, or holding up, the design object for other group member to see. Meanwhile, they contributed appreciation, support, or criticism. In our observations, this kind of critical moment occurred as a result of intense, silent thinking, or struggling interaction with some aspect of the problem.¹⁷ Also, Reid & Reed agreed that the leading function in group interaction is characterized by this sort of figurative reasoning. Both modalities of group reasoning incorporate turn-taking interaction. However, arguments based on figurative reasoning seem to have exceptional positions as leading functions, in comparison with reasoning based on conceptual arguing.

¹⁴ Goldschmidt, G., The dialectics of sketching. *Creativity Research Journal*, 4, 123-143, 1991; Goldschmidt, G., On visual design thinking: the vis kids of architecture. *Design Studies*, 15, 158-174, 1994.

¹⁵ Goldschmidt, G., On figural conceptualization in architectural design. *Cybernetics and systems research*, Vol 1 & 2, 1992.

¹⁶ Cross, N., Christiaans, H., & Dorst, K., Introduction: the Delft protocols workshop. In N Cross, et al. (Eds.), *Analysing Design Activity*, John Wiley & Son, Chichester, pp. 1-14, 1996.

¹⁷ Olsson, B. Descriptive languages in and for creative practice: Idea development during group sessions. (In Swedish) *Beskrivningsspråk i och för kreativ praxis: Idéutveckling under gruppssession*, Doctoral Dissertation 1651-4238; 68. Mälardalen University Press, Västerås, Sweden, 2008.

On Verbal Overshadowing

Schooler¹⁸ has introduced the concept ‘verbal overshadowing’. He has found that as long as we remember something visually, for example a face, it is seldom difficult to find that thing in a larger amount, such as a crowd of people. This he calls ‘verbal overshadowing’. However, if first requested to describe this particular face verbally, the mental image tends to be diffused or disintegrated. An explanation for this phenomenon is that memory content transferred from the right cerebral hemisphere to the left is distorted by the movement. The effect of verbal overshadowing demonstrates how the process of describing non-verbal stimuli (a face, a flavor, or music, for instance) hinders the subsequent reconnaissance. Schooler has studied test subjects with higher perceptual expertise or capacity than verbal capacity. The recognition of faces is an example of high perceptual capacity.

On Visual Materials

Theories concerning visual representation are used to analyze visual materials used in this session. First and foremost is Rudolf Arnheim’s theories relating to perceptual processes are considered in this paper.¹⁹ Furthermore, theories addressing considerations related to computer-aided sketches have fundamental impact on understanding the force of each specific type in an analyzed design session. In her research, Kathryn Henderson has evaluated the role of electronically generated and on paper sketches used in design processes, specifically in a design engineering context.²⁰ In matter of spoken or written instructions combined with pictures, research presented in *Bildens tysta budskap* (In Swedish) by Yvonne Eriksson is concerned.²¹

Summary of Theoretical Perspectives

Group creativity based on social interaction, which embraces difference and diversity in thought and action. If the group is trained in improvisational approach to negative consequences such as groupthink and conformity pressure to be countered. An effective idea development session needs of emerging ideas, i.e. group ideas, made visible and described. Research has shown that creative group interaction is establishing temporary shifting patterns between figurative and conceptual descriptions. However, other research identifies risks to the rapid adoption of the verbal descriptions.

Analysis

In the analysis of the group’s idea development and social interaction, we have focused on types of sketches, artifacts supporting the idea development, and group dialogue.

¹⁸ Schooler, J.W. Verbalization produces a transfer inappropriate processing shift. *Applied Cognitive Psychology* 16: 989-997, 2002.

¹⁹ Arnheim, R., *Visual Thinking*, University of California Press, Berkeley, 1997.

²⁰ Henderson, K., *On line on paper- Visual Representations, Visual Culture, and Computer Graphics in Design Engineering*, Massachusetts Institute of Technology, Cambridge, 1999.

²¹ Eriksson, Y., *Bildens tysta budskap* (In Swedish), Nordstedts Akademiska Förlag, Stockholm, 2009.

Type of Sketch

The team used four different types of artifacts in this session. Of them, three are different types of sketches and models. One is a comparable “chassis” from a concurrent firm producing similar products. The design team is exposed to each of these four types at an early stage. Each kind has its own impact in the form-generating process, as well as in the decisions that take place in the design team during the meeting. Initially, these images, together with verbal introduction, “supply the designer with the preliminary nucleus from which the actual structure develops.”²² What is even more notable is the relationship to abstract thinking: “all abstract thinking relies on some perceptual referent.”²³ Therefore, “even [the] most abstract theme is tied from the beginning to concrete images.”²⁴

The Significance of Each Type

First, there is a plain scale model, made in Styrofoam (figure 4 and 5). It is kept white since it is the material’s original color. On the surface, simple lines are drawn proposing outlines and sections of the object. The lens position is also situated in this way. This model is mostly used for the tactile examination of proportions and is, therefore, frequently passed forward in the group during the session. It occurs that this model is picked up by a member of the team while addressing primarily proportions, to state and argue particularly form suggestions and pitch the disposition of the volume. Furthermore, this model seems to have an important impact on recalling, in a tactile sense, proportions and scale.

²² Arnheim, R. *The split and the structured: twenty-eight essays*, University of California Press, Berkeley, 1996.

²³ Arnheim, R., *Visual Thinking*, University of California Press, Berkeley, 1997.

²⁴ *Ibid.*



Figure 4: Initially, the Scale Model is Passed Around by the Team in the Session. Simultaneously, a 3D Model is Presented and Rotated to Explain Inside Constructions and Techniques

The second artifact is the mould-casted chassis (figure 4 and 6). This object is brought to the meeting for two reasons: to provide the team with information regarding the production methods and to explain the chosen material efforts. The material discussed is either casted aluminum or comparable alloy. This artifact leads the team into a discussion of surface and appearance in terms of the material chosen. The elegance of the surface is highlighted, as well as the exclusiveness in its “feeling” of gravity. The material characteristics themselves and the casting methods have an impact on future shape discussions.

The third type of object is a 3D model, exposed on screen by a projector connected with a computer (figure 4). The 3D model is maneuvered by the project leader in the team. It is rotated in order to clarify, point out, and explain inside constructions and techniques. This technical concern is part of the formal decision regarding the possible outline of the final product.

The fourth type of sketch is used by the project leader (the creative director) continuously during the session. These drawings are conducted on big paper sheets located on the wall (figure 5). They consist of principal words. At first, only words appear on the sheets. They make up a sort of key word set that supports or decides the outline. Later on, the project leader starts making quick sketches at the same time as he talks, in order to establish a general shape idea. The personal drawing skill itself and the set of words on the “board” seem to have an impact on the team.



Figure 5: The Project Leader is Holding the Scale Model in his Hands. The Team’s Attention is Drawn to the 3D Model in front. Simple Sketches can be seen on the Sheets in the Background. The Paper Sheets also Present Key Words

As stated in the introduction, the session was held in a small, traditionally furnished conference room. It is what takes place in that room that is noteworthy. The team’s project leader maintains more or less a standing position during the entire session. He either stands at the front of the room or in a position to point out or draw on the white sheets on the long side of the room (figure 6). Simultaneously leading the dialog, holding a standing position in the room, and making quick sketches, the power of the board becomes obvious in this session.

A great role in stating the outline of the coming product takes place when the team is exposed to photographic images of similar products selected by the session leader (figure 6). These pictures have an impact on the discussion in terms of shaping an iconic statement. Together with the pictures, spoken language is used to point out directions and acknowledge specifically interesting themes.²⁵ One or two in the team state “Apple like” or rather “Sony like” in terms of announcing a certain exclusivity. Again, the position in the room and the use of gestures confirm the two modes: picture and language.²⁶ Much of what is expressed in this part of the session has already been discussed earlier. However, it is confirmed. The team pronounces similar words, points out similar pictures, and borrows expressions from each other to show consensus.

²⁵ Florin U., *Från idé till gestaltsförslag : fallstudie från Projekt Konstpaus* (In Swedish), Mälardalen University Press, Västerås, Sweden, Licentiate Thesis No. 126, p 32, 2010.

²⁶ Sälgö, R., *Lärande i praktiken* (In Swedish), Stockholm: Prisma, p 83, 2000.



Figure 6: The Team is Exposed to Selected Photographic Images of Similar Products. The Implication of this is to State the “Image” of the Product

Group Dialogue

The dialogue under our scrutiny alternates between relaxed, laid back small-talk about peripheral subjects, complete silence, and intense and eager dialogue. In those periods of the dialogue, several participants flesh out their own ideas. When doing so, tension gradually increases. There are several mutually competing solutions living side by side.

The analysis of the group’s idea development indicates intervals of intense verbal interaction, often including the physical object. In these periods of the verbal interaction, the object functions as a distributor of speakers and as a concener of the discussion. Brereton et al.²⁷ confirm this pattern of group interaction. They found that design discussions develop partly by focusing on the task (how to solve a specific problem) and partly through transitions between different aspects or problem areas when the group interaction seems unstructured and unfocused.

In our studies of idea development in groups, figurative arguing was not as dominant as in the Goldschmidt or Reid & Reed²⁸ reports. However, our observations of groups of industrial designers’ idea development confirm shifting patterns between two modalities according to Goldschmidt.

²⁷ Brereton, M. F. Cannon, D. M., Mabogunje, A., & Leifer, L. J. Collaboration in Design Teams: How Social Interaction Shapes the Product. In: *Analysing Design Activity*, John Wiley and Sons, Chichester, UK 1996.

²⁸ Reid, F. J. M., & Reed, S., Cognitive entrainment in engineering design teams. *Small group research vol. 31 no. 3*, pp. 354-382, 2000.

The Power of the Board

In our observations and interviews, the following is confirmed: the interactant holding the pen tends to control the design discussion. Group members describe figurative arguing in the group's idea development in terms of 'the power of the board'. Parker²⁹ maintains that megaturns arise because of implicit rules for group interaction. These rules guide the distribution of speaker change in such a way that pairs of speakers take up "the stage" during a time period while the rest of the group members listen. Sometimes one listener begins to speak, causing the speaking pair to "lose the stage". This shifting pattern in group interaction, with megaturns and figurative arguing, is a key component in models that describe the structure of group interaction³⁰.

Summary of Analysis

Consequently, on one hand, group interaction and idea development evolve through shifting patterns of intense verbal interaction based on conceptual arguing where the designers exchange short verbal descriptions or comments. On the other hand, group interaction and idea development evolves through comparatively more exhaustive descriptions based on figurative arguing, such as sketching and gesturing. Group dialogue based on figurative reasoning seems to have a leading function in design discussions.

Discussion

In our observations of groups of industrial designers' social interaction, verbal descriptions are paramount. However, there are brief periods of figurative arguing. When a group member sketches, the rate of the shifting pattern between modalities becomes considerably slower than during the periods of conceptual arguing. In these kind of verbal group interaction, new ideas seem to arise from short periods of total silence rather than during periods of intensive interaction. Group interaction characterized by verbal discussion with short periods of complete silence might be perceived as the group's creative phase, comparable to the incubation state. However, periods of silence characterized by figurative reasoning silence could also be perceived as the members' distance or departure from shared ideas.

The results from our research bring the concept of timing up to date since it is given a specific meaning in relation to the group interaction pulsation in shifting patterns. It is not indifferent for the emerging group idea when a specific initiative is performed or a statement introduced on the group's thinking stage. The same initiative could be given a different meaning or importance on the group idea development depending on when it is introduced in relation to the shifting interaction pattern.

²⁹ Parker, K. C. H., Speaking turns in small group interaction: A context-sensitive event sequence model. *Journal of Personality and Social Psychology*, 54, pp. 965-971, 1988.

³⁰ Dabbs, J. M., & Ruback, R. B., Dimensions of group process: Amount and structure of vocal interaction. *Advances in Experimental Social Psychology*, 20, 123-169, 1987; Parker, K. C. H., Speaking turns in small group interaction: A context-sensitive event sequence model. *Journal of Personality and Social Psychology*, 54(6), 965-971, 1988; Stasser, G., & Taylor, L. A., Speaking turns in face-to-face discussions. *Journal of Personality and Social Psychology*, 60, 675-684, 1991; tasser, G., & Vaughan, S. I., Models of participation during face-to-face unstructured discussion. in *Understanding Group Behavior: Consensual Action by Small Groups*, Vol. 1, E. H. Witte and J. H. Davis, (Eds.), Lawrence Erlbaum Associates, Mahwah, NJ, pp. 165-192, 1996.

Another significant event takes place in the explored design discussion (i.e., when idea development goes forward) when passing around a model or an artifact in the group during the session: a higher level of debate is observed at the same time.

Findings

We have been able to define the significance of different used sketch types (techniques) and the use of these artifacts in this design session. Particularly noteworthy is the impact of models for tactile examination. The scale model frequently was passed around when addressing size and recalling, in a tactile sense, proportions and scale. The experience of the chosen material and the sense of gravity were addressed in order to highlight exclusivity related to the feel of the material. This tactile, experience-based significance would not have appeared if the team had only had pictures of the chosen material to address.

From this case, we notice a pattern that confirms the use of models or sketches as instructions or orientations of shape. In addition, that use also functions as a force just before spoken activity takes place in the team. Together with the artifacts, pictures, models, and chassis, spoken language points out directions and acknowledges specific, interesting themes. Also, the impact this team's project leader has on the idea development is obvious. In explaining the impact of this particular session leader, the combination of mandate and skills is to be emphasized. The skills in making quick drawings and the self-confident leading of the session hugely influenced the other group members. Design development on the whole is a bit inhibited by the team leader's posture (in other words, he stands while the others sit during the entire session). The relationships in the room are made clear, not verbally but through body language.

Furthermore, the ability to appropriate timing in relation to the emerging group idea has proved important for the exchange of ideas efficiency. We believe that the training of members of the group's improvisational approach is the facilitator's most important tasks in group-based idea development.

In this study, we have strived for better understanding of the factors that interact in the construction of group ideas and what conditions that support the emergence. We intend that it may recommend action to be undertaken and the skills that need to be trained to create more effective exchange of ideas and a clearer shared understanding.

Recommendations

Finally, based on the findings of this study and our previous research we have compiled the following recommendations which aim to establish creative interaction, exchange of ideas and effective group-based idea development:

- Use several sketches simultaneously in a creative session to stimulate divergent dialogue and to counteract groupthink.
- Use different type of models and sketches that stimulate different modalities and support different senses.
- Make sure that all participants sketch, to counteract the power of the board syndrome.
- Use different kinds of physical objects (a prototype, for example) to minimize the verbal overshadowing effect.

- Encourage participants to use figurative arguing when describing and shaping their ideas, in order to counteract any verbal overshadowing effect and to support the realization of megaturns.
- Await introducing images until late in the idea developing session to minimize any fixation on one particular solution.
- Encourage constructive criticism from the beginning of the idea development session (for example, by emphasizing that all kinds of ideas are welcome).
- Train the participants' abilities in both sketching and describing ideas in more than one description mode.
- Train the participants to adopt an improvisational attitude in relevant phases of the idea development process.
- All participants, including the session leader, need to trust that group member interaction will generate qualified and sustainable solutions (i.e., group ideas).
- Be aware of positions in the room. A standing position signals leadership.

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About the Authors

Dr. Bengt Köping Olsson

Bengt Köping Olsson has the background of an engineer and a degree in psychology. He has a Master of Fine Arts in piano and has been teaching piano and also worked as a musician on a freelance basis for several years. In 2008 he earned a PhD degree in Innovation and design and is now working as a lecturer. In his research project Bengt Köping Olsson is trying to come to grips with creative activity in an intense group effort, such as when musicians improvise or when a group of industrial designers brainstorm to solve a client's problem. One might say that what he is studying is the handover of the creative spark from one person to the next, inspiration at best accelerating.

Ulrika Florin

Ulrika Florin's research is focusing both artistic problems and on themes linked to society. Her project leading experience and involvement in great projects such as "The Art Break Project" has given her opportunity to study processes, among artists and academics together. "The Art Break Project" (Projekt Konstpaus) is a development project partially financed by the European Union (EU). The project team consisted of several artists, and academics such as archaeologists, cultural geographers, biologists and geologists. The main objective of the project team is to provide the basis for the construction of a culturally inspired walking and bicycle path designed with artistic character influenced primarily by the municipality's extensive nature/cultural heritage. Ulrika Florin held her MFA, Master in fine art- in three-dimensional design, 1992 at Konstfack, University College of art craft and design in Stockholm. Since then Florin is a practicing artist with the public space as her specialty. Within 2006, Florin started her PhD Candidate position at Mälardalen University in Eskilstuna. Florin is focusing design processes and interpretation as well as visual perception. Her research project is a part of the research group "Design inspire innovation" a division of the multidisciplinary milieu IPR (Innovation and Product Realization) at Mälardalen University, that works together from a broad spectra view with questions concerning visual materials. The interaction act that take place in creating, as well as reading, sketches is now Florin's main focus in her research. In 2010 she presented her Licentiate Theses, *Från idé till gestaltningsförslag: fallstudie från Projekt Konstpaus*, Mälardalen University Press 126. Currently Florin is working as Lecturer at Mälardalen University conducting her PhD Studies and produce artistic works.

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