

This chapter describes how I set up the *theoretical framework* for this research project. *Practitioners* and *researchers* from different parts of the field were involved to provide fresh perspectives on *designer collections of visual material*.

The chapter is based on a paper accepted at the *Journal of Design Research*. It describes the *rationale, method* and *results* of involving experts with *mindmapping techniques* for their interaction with collections of visual material. In the last sections it gives an overview of the literature included in that framework.

In this chapter I look at our phenomenon critically from a *research method perspective*. The big shift in thinking that resulted was, that designer interaction with their collections does not benefit from optimized “*image database query systems*”. Instead, designers get *new insights* in the *activity of organizing and growing* their collections.

This work was done in early February to March 2001 and resulted in a theoretical framework that was used in the remainder of the project.

ABSTRACT

Participatory Design Techniques have been successfully applied to let users inform and guide designers in their design projects; in this chapter we present how these techniques can be used to let designers inform and guide researchers in setting up a theoretical framework. The approach is specifically useful for multidisciplinary fields, such as design research, where many disciplines from anthropology to design methodology intertwine. The goal of this technique is to find insights that are covered across instead of within disciplines, and to narrow the ingredients down to a manageable amount. The participatory design approach has been proven to be successful in design user studies, by adopting research techniques from ethnography and the social sciences. In this study, the approach has been used as a bootstrapping technique to create a theoretical framework for the problem of designer's interaction with visual materials. In this research designers are looked at in their role as users of design tools. Using these participatory design techniques the author constructs a framework tuned to the phenomenon. The framework combines both the richness of everyday experiences with theoretical constructs presented in literature.

This chapter is largely based on: **Keller, A.I., & Stappers, P.J.** (accepted) *Codesigning a theoretical framework with reflective practitioners. Journal of Design Research.*

2.1 Problem

Many disciplines intertwine when researching the tools designers use for early concept generation. Research in such a multi-disciplinary field is built on both theoretical knowledge and practical experience in tool development (Stokes, 1997). This requires collaboration of disciplines such as cognitive science, social sciences, design methodology, media research, human-computer interaction and computer science. In some aspects these disciplines work well together but in other aspects these disciplines stay close to their own paradigm. For example, in the literature on image collections there is surprisingly little overlap in the image management (the technical angle) and image classification (the library angle) research (Cawkell, 1992).

In this multi-disciplinary setting, what is the theoretical knowledge needed to support a research project? Because a grand unified theory does not exist, we need to take ingredients from different disciplines for each research project. Then again we need to make a relevant selection; it is not possible to cover all the disciplines and every aspect available. By looking at a phenomenon from different viewpoints, but on the level of everyday experiences, a framework can be constructed that facilitates further research and development. In this respect, multidisciplinary application-minded research bears many resemblances to design projects, rather than to formal scientific studies conducted within an established paradigm.

To achieve such a framework one must escape the bias of a particular field; there is a need to stay removed from the different domains before setting up the theoretical framework. Given the fact that every researcher is always in some way hindered by bias from his or her discipline, a method is needed to avoid premature commitment to frameworks or concepts. This problem of fixation is well known in design (Oxman, 1999; Pasman, 2003).

2.2 Possible methods

Several methods exist for establishing a scientific framework for a research problem (Babbie, 2003). A literature search gives you access to the insights found by your predecessors. Often interviews, observation techniques, experiments and statistical analysis are used to expand and deepen on existing insights. Most of these techniques require you to start out with a theoretical framework and build on that. A contrasting approach is practiced in Grounded Theory, where theory is developed inductively from a corpus of data, by studying transcripts and labeling variables and their interrelationships using different types of coding (Glaser & Strauss, 1967). This approach, in which theory emerges from real-world observations, is also applied to literature search in Grounded Theory. In later publications on Grounded Theory (Glaser, 1978) researchers are advised to read widely



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Examples of different ways in which designers keep their collections of visual material.

Part of an inventory by the author.

- 1 Box of cards
- 2 Computer
- 3 Stack of magazines
- 4 Photo wallets
- 5 Cabinet with organized (left) and unorganized (right) drawer

while avoiding the literature most closely related to the research topic before gathering and analysing data. This makes Grounded Theory useful, but difficult to combine with existing theories and literature.

In our approach we use the emergent aspects of working directly with real-world observations, values and opinions as a bootstrapping technique to integrate existing theories into a theoretical framework.

2.3 Approach

To find the categories, keywords and constructs that form the basis of our theoretical framework, we use knowledge elicitation techniques with people that are familiar with our research problem, either through professional or academic experience. These techniques come from the field of participatory design (Sanders, 2002). Participatory design is a relatively young movement that aims to make the end user an active participant in the design process. To achieve this goal, the participatory design techniques use a broad range of methods from anthropological research. Particularly in Generative Tools, these methods are combined with methods and techniques from design (Stappers & Sanders, 2003).

Generative Tools help participants to open up about the phenomenon being researched. By making expressive artifacts such as collages, flowcharts and even models and by presenting and talking about these artifacts, the user shares insights, often not mentioned in interviews, which are rich in content and context. At all times the user is encouraged to take initiative and is seen as the expert in the domain of his or her personal experiences.

Participatory design has been successfully used in several design projects to give a direction for further design process (Laurel, 2003). In this article we propose to use these tools in design research to give directions to theory development.

2.4 Designer collections of visual material

The research project presented in this paper concerns the way designers keep and use their collections of visual material, such as advertisements, magazines and pictures. Some examples of different ways in which these collections can manifest themselves in the designer's environment are shown in figures 1 to 5. Our main research questions are 1) how designers currently use their collections of visual material, and 2) how new media techniques can help the designer in the use of such collections.

Earlier research on the designer workplace (Kolli *et al.*, 1993) have shown that designers surround themselves with rich visual material and use existing images and photos in moodboards and collages for presentation to their clients. Eckert and Stacey found that designers, in their case knitwear

designers, use these collections of visual material as a “*source for inspiration*” in the design process (Eckert & Stacey, 2000). At successful design companies homegrown collections of materials are appreciated, such as the IDEO Techbox, a cabinet filled with technical oddities, to serve as a tool for serendipity and to support lateral thinking (Kelley & Littman, 2001). In computer science, different visualization techniques have been explored to support this kind of serendipity with personal photo collections (Kang & Shneiderman, 2000).

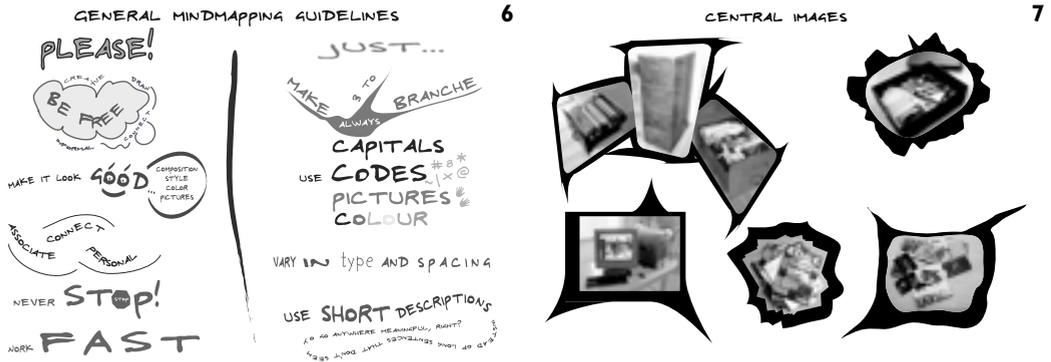
For further research and tool development it was decided that the present case of informal collections of visual material requires a theoretical framework that integrates different fields and approaches. By first taking a helicopter view before narrowing down on relevant theory, we can attempt to be unbiased by our disciplinary blind spots. We identified our own bias as being researchers on user-centred design in an engineering school, which tends to force us to technology-based, solution-oriented approaches. We believe that given the right method and participants we can compensate for this bias.

2.4.1 Method

To get our keywords, constructs and experiences surrounding these collections of visual material we needed to get different people together who both had knowledge of theory and practice on the matter. Furthermore we needed a generative tool that would let them open up about the phenomenon in an associative yet structured manner. We decided to use Mind Mapping for this. Mind Mapping is a technique that combines free association with structuring through composition and categorization (Buzan & Buzan, 1994). A Mind Map is a method for associating, structuring and visualizing in which one starts out with a strong central image or theme, branching out with associations from that. All the statements in a Mind Map are linked to other statements, and color, visuals and drawings are included in these Mind Maps.

The advantage of Mind Mapping over other Generative Tools is that the results are relatively easy to use, and that it results in more structured stories over pure associations (Stappers & Sanders, 2003).

We used the images shown in figures 1 to 5 as a means to prime our participants to the phenomenon. The real-world examples of collections of visual material we chose to let them associate on, keeping a focus on the phenomenon, rather than bringing in pre-existing theories.



- 6 Instructions given to the participants on how to make a Mind Map (adapted from Buzan & Buzan, 1994)
- 7 Central images that were reprinted on cardboard plates showing different ways in which collections of visual material can appear in the designer's workplace

2.4.2 Procedure

Four designers/artists participated in this study. All were reflective practitioners (in the sense of Schön, 1983); they had explicitly worked in practice, research and teaching about design. The participants consisted of three men and one woman, one was a professor with a background in design (initials JH), the second one was a designer and teacher who had started her PhD research (initials MS), the third one a teacher and researcher with a background in graphic design (initials FM) and the fourth one an artist with a background in teaching art and drawing (initials TK). Each was invited for an afternoon session in their own workplace. In the instruction they were asked to think of their interaction with their collections of visual material. They were given instructions on how to make a Mind Map (figure 6) and five central images showing different manifestations of collections (figure 7).

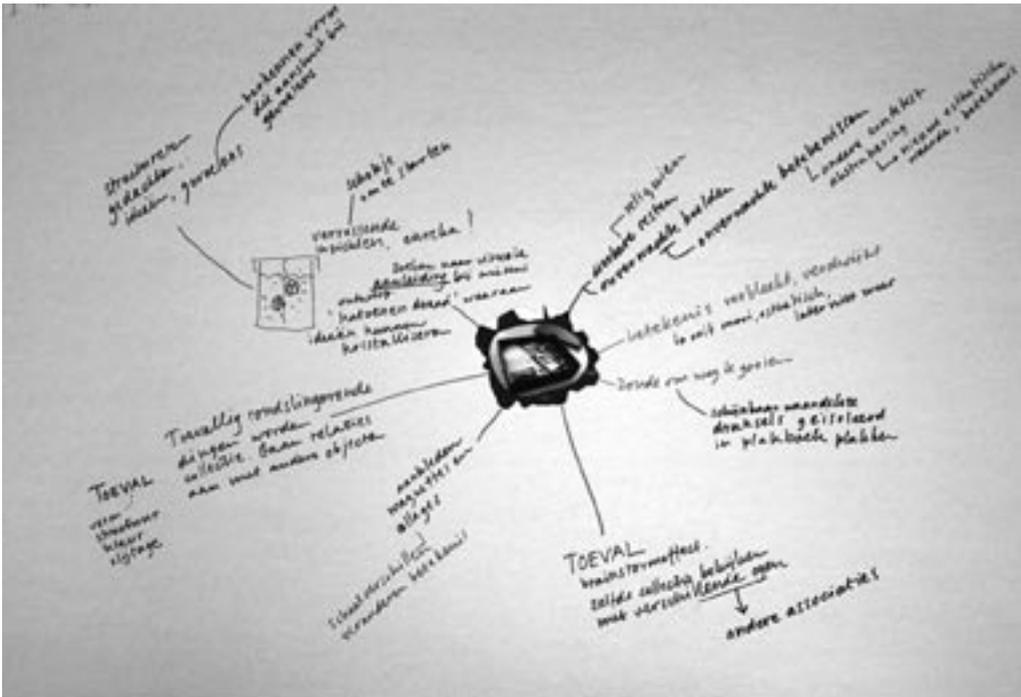
Each participant was asked to select three out of the five cardboard plates and make three Mind Maps, containing the important aspects relating to their interaction with the collection, radiating out from the chosen central image. After this Mind Mapping session, which did not exceed 45 minutes, the participants were asked to present their Mind Maps and explain their train of thoughts (figure 9). Because both this research method and the Mind Map technique were new to all our participants, we finished the sessions with a short evaluation on how the participants experienced the method and technique.



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- 8 Participant FM drawing a Mind Map
- 9 Participant FM presenting the result
- 10 Mind Map by FM (in Dutch). It contains expressive words such as “Eureka!...” and a drawing of the collection as a saturated bath with crystal formation

The Mind Maps that came out of these sessions were analysed by the authors. All the individual Mind Maps were combined into one big Mind Map containing all the aspects mentioned, but reorganized into recurring themes and recurring branches. The combined Mind Map was written out and put together in an outline by the author. The outline in turn was translated, grouped and linked by both the authors.

2.4.3 Results

The sessions lasted approximately 90 to 120 minutes, and making the Mind Map took considerably less time than presenting and explaining them. All of the participants made three different Mind Maps as instructed. Though it was not part of the instructions, we could see a distinct pattern in the order of the three Mind Maps: the first one discussed the phenomenon in general, the second one zoomed in on one aspect from the first Mind Map. Finally the third one was used to cool down; the participants used it to make their final loose remarks or to play around with the Mind Mapping technique itself. Although the Mind Mapping technique was completely new to all of the participants, they all worked fluently and reported it as being “*enjoyable*” or “*interesting*”. The participants all used metaphoric drawings to symbolize their collection or the role of their collections.

The keywords and phrases used by the participants contained extensive lists of aspects pertaining visual material in their design work. Also they used stories and descriptions of experiences to explain their interaction with collections of visual material. Finally, many of the second Mind Maps contained dreams or aspirations on their ideal collection, both in content and in interaction (figure 10). All of them used strong metaphors in their Mind Maps, for example, browsing the collection was described as “*a walk in the woods*”, and the collection as a source for inspiration was described as “*a saturated salt solution*”.

Apart from the observations from the Mind Maps noted above and in table 1, the explanations by the participants provided rich metaphors and narratives related to designer collections. Two of the participants compared the evolution of the collection to plant life, specifically woods and branches. The participant MS, who had just started her research, had two very interesting analogies:

“I see the way I grow my collection as to nursing a small branch. It needs strong roots, which you can’t see and you can’t really do anything about it, but what emerges above needs to be trimmed, nurtured and fed.”

“Looking at ... or visiting my collection is like taking a walk in the woods. You usually take the same path and you see the same things, which is nice, but the really interesting things are what has changed since you took the walk and the little detours you find and explore yourself.”

The artist TK used the same nature and travel analogies, but in different and shorter terms. He talked about “*sedimentation, humus*” and “*a journey of exploration through known areas*”.

Table I. Topics touched

Main topics	General aspects	Conclusions on the topic
Description of collection	<p><i>Media types:</i> photo, drawings, magazine, newspaper clippings, whole 3D product, part of 3D product, sample material.</p> <p><i>Attributes:</i> composition, detail, meaning, form, structure, emotion, multiple sizes, multiple formats, multiple places.</p> <p><i>Modality:</i> 0D (text as visual material), 2D, 3D, Video, Virtual objects (thoughts and memories).</p> <p><i>Storage:</i> computer, wall, shelf, filing cabinet, shoe box.</p> <p><i>Ownership:</i> personal, shared, a typical designer collection.</p>	<p>They all spoke of a highly diverse collection, both content, material and storage.</p> <p>The reasons for keeping things are not always in the pictures themselves.</p> <p>All of the participants spoke of collections that are in some way typical to a designer (being loosely structured, chaotic).</p>
Use of collection	<p><i>Process:</i> adding, maintaining, organizing (structuring, branching, sorting), selecting, fitting into categories, cross referencing, loosing things, temporary placeholders, growing, throwing away.</p> <p><i>Method:</i> testing ideas (benchmarking or fitting), presenting, evaluating.</p> <p><i>Creativity:</i> combining, surprising, discovering, living with information, triggering associations, constructing/forming categories, interpreting.</p> <p><i>Other uses:</i> 'just looking', playing with it, daydreaming.</p> <p><i>When:</i> short spare time, when in bad mood, with a prepared mind, in the back of your mind.</p>	<p>None of the participants spoke of labelling, but a lot about organizing and reorganizing.</p> <p>Creativity and collection gave a lot of different results. All of these keywords had to do with some way of categorization, but in different terminology. None of the participant used the same words.</p> <p>Collections are not used at planned moments and often the participants refer to non-use (remember/available).</p>
Value of collection	<p><i>Stability:</i> new aesthetic values emerge or disappear, forgetting, unburdening, estrangement.</p> <p><i>Insights:</i> new relationships, differentiating scales, looking with other eyes.</p> <p><i>Personal:</i> apparently worthless, open to interpretation, not understood by others.</p> <p><i>Symbolism:</i> monument, representation, relic, a dream.</p>	<p>A collection itself is not stable, neither is the way the designer values it. New relationships and insights is what makes having a collection worth the effort.</p> <p>A "finished" collection is both something to aim for as it is useless.</p>
Goal of collection	<p><i>Remembering:</i> documenting, archiving, mental imaging, memory.</p> <p><i>Sharing:</i> communicating (experiences or feelings), with oneself, with clients, colleagues, extreme objects/pictures.</p> <p><i>Urge:</i> a nice activity, nice thing to won, making beautiful things, a pity to throw things away.</p>	<p>The obvious reason for keeping things in a collection is to find them back again, but that is not the main goal mentioned.</p> <p>The urge of collecting and the fear of throwing things away is mentioned as a more important reason.</p>

The graphic designer FM used a strong metaphor when explaining the drawing on his Mind Map in figure 10. The drawing represents his collection as being a "saturated salt-water bath". The way to get new ideas from your collection is described as:

"If you need a new insight you stick your problem into the collection like this little metal stick and you give the bath a tiny shock. Crystals will form on the metal stick. It is a tiny shock of insight."

The description of the collection also contained an interesting paradox. A perfectly organized finished collection was what most participants were aiming for or dreaming of (“*where everything is part of the dream*”, TK). The image of the organized filing cabinet (left part of figure 5 and 7) was seen as a good example of that. On the other hand, that same neatly organized filing cabinet by the same participants was seen as an example of a bad thing. It was a “*dead monument*”, containing negative things like “*bureaucracy*” or “*x-files*” (TK); it was not a “*typically designer*” (JH) collection.

2.4.4 Constructing theoretical framework

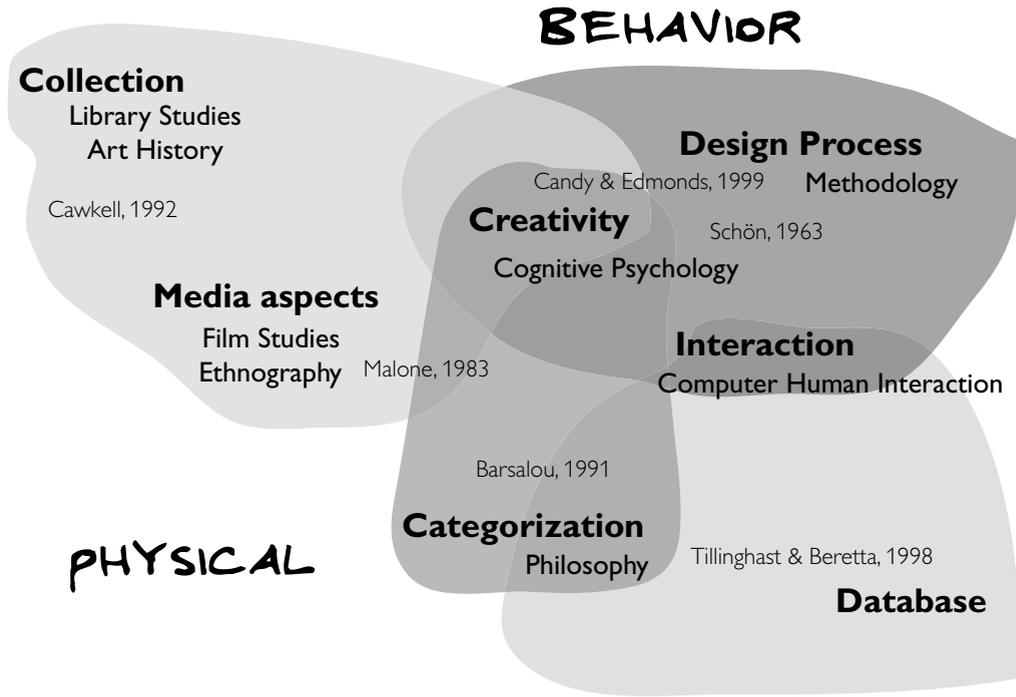
The keywords and conclusions of the Mind Maps shown in table 1 were used as the basis for a further literature search. The richer metaphors and narratives from the presentations were not used directly in formulating the questions for our literature search, but played an important role to put its finding in context.

The general aspects from table 1 were used to widen the literature search and the conclusions on the topic were used as filters to narrow down on the literature.

The main goal of this exercise was to escape the bias of our own discipline, therefore we first looked at the results that differed from what we expected. Contrary to our expectations none of the participants mentioned textual or verbal labeling in their Mind Maps or presentations; searching with queries and alphabetical sorting were not mentioned at all. All our literature found so far was pointing at an approach of keywords and labels for organization. Apparently this approach does not fit with the experience of interacting with personal collections of visual material by designers. This discrepancy is supported by two other conclusions from the results: 1) the goal of the collection was not to find back images, but for remembering, sharing and for the urge of collecting and 2) a “*finished*” (or non-personal) collection was controversially spoken of in negative terms, not fitted for designers. The existing literature on image management tools did not support this kind of approach to collections.

The description of the collection as mentioned in table 1 primarily pointed at media aspects: modality of elements in the collection, where and how it was stored, the attributes beyond what was on the pictures themselves and ownership. These are typically aspects that media studies have critically looked at. The issues of form and storage for organization have been explored in ethnographic studies on, for example, how people organize their desks (Malone, 1983).

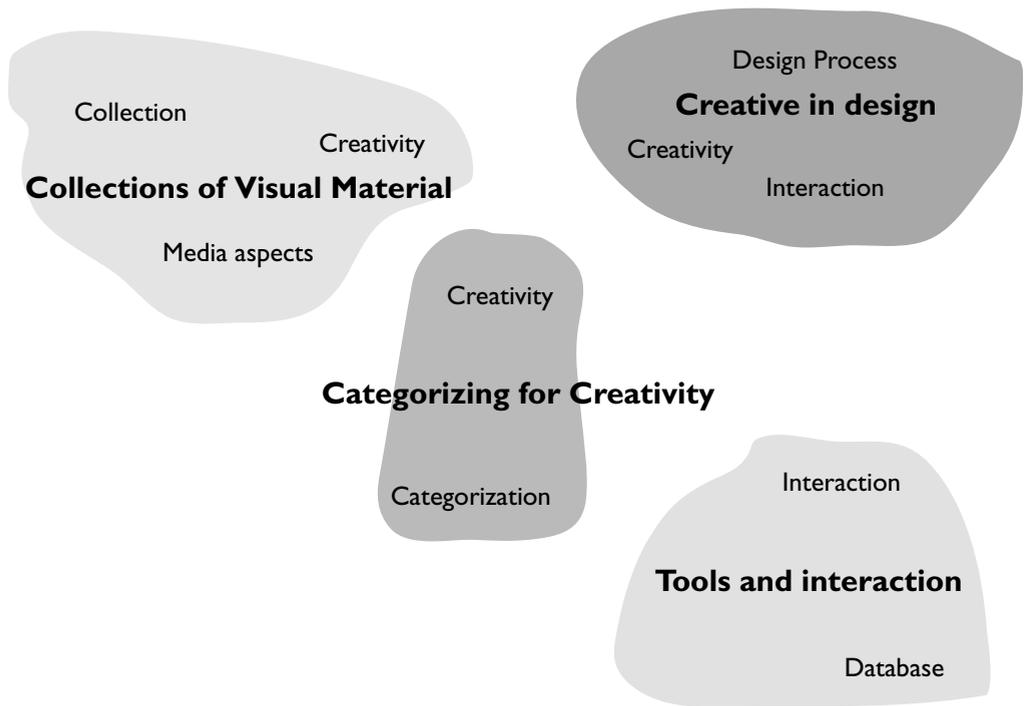
The participants described their use of the collection related to creativity, design process and interaction. The participants characterized their use of the



11 An overview of the literature field that was constructed from table 1 and the literature search. Disciplines are shown as clouds with key themes and references among them; we can see overlap and lack thereof in the different disciplines

collection as not being part of a formal procedure or structural design process. The use of technology and interfaces to support this kind of peripheral activities (see table 1: living with information, short spare time, in the back of your mind) has been explored as a new path for interaction design (Norman, 1998; Weiser & Brown, 1996).

The way in which the participants mentioned creativity and their collection had to do with trying to match different concepts together (see table 1: combining, discovering, triggering associations). This description of creativity comes close to what Schön describes as a “*displacement of concepts*” (Schön, 1963) in which new ideas come from trying to fit concepts onto each other through the use of metaphors. The process described by Schön bears resemblances to the metaphor of the “*saturated salt bath*” by participant FM. Another important and related aspect on creativity had to do with the categorization itself (see table 1: forming categories, fitting into categories, interpreting). New insights can come from making new categories, based on the material available at hand (Barsalou, 1991).



12 Exploded view of the theoretical framework presented in figure 11

The literature mentioned above showed overlap in some areas, especially in the different approaches towards creativity and categorization. For further research, such a complex set of intertwined literature references needed to be transferred into a usable visualization or organization. To do this we developed a cartographic overview of different themes, disciplines and exemplary literature shown in figure 11. The figure provides an helicopter view of the theoretical framework and was used in the remainder of this research as a reminder or placeholder for new literature or insights. The central themes are Creativity and Categorization. Around these themes we find important other themes such as Media Aspects, Design process and Interaction. Our starting point, the collections themselves and computer tools and databases to support them are now only peripheral aspects.

2.5 Theoretical considerations

After this study presented in the previous sections, we did a broad literature review. The general aspects mentioned in table 1 were used as the primary search criteria for a literature search in our library. The theoretical framework illustrated in figure 11 was used as a means to structure these results.

The framework covers many disciplines, therefore it is impossible to do a complete literature review on all these fields. From our design perspective we decided to stay broad and integrate different fields to serve our problem.

We didn't stop our literature review after this initial search. In the years after this initial literature review, we used our theoretical framework to structure and organize other literature that bore relevance to this project.

Our framework became a tool for organizing and collecting other literature and theories.

The remaining of this chapter will give an overview of the theories found in the literature that relate to designers collecting visual material. To do this, the different areas of the theoretical framework have been untangled into four distinct areas, presented in figure 12.

The four areas in figure 12 will be presented in the remainder of this section, starting from the perspective of the Design Process with aspects of design methodology and interaction design and its relation to creativity. After this creativity itself will be further examined and especially in relationship to categorization literature. The next field covered is the theory on collections themselves and specifically the role of media aspects in it. The overview ends with a brief look at tools and specifically computer interaction.

2.5.1 Collections for creativity

Being creative means giving rise to new outcomes, which is seen by peers as new and relevant (Csikszentmihalyi, 1996). This immediately suggests that creativity can't be seen separate from the context and social setting. Neither the context nor the person have complete control over process, which is why creativity is sometimes seen as an activity by a person and in other cases as something that happens to a person.

In design, creativity relies on visual thinking (McKim, 1980). The importance of images and even other senses are also deemed important outside the realm of design: *"The words or the language ... do not seem to play any role in my mechanism of thought. The physical entities which seem to serve as elements of thought are certain signs and more or less clear images which can be 'voluntarily' reproduced and combined ... the above mentioned elements are, in my case, of visual and some muscular type."* (Einstein, 1979).

Candy and Edmonds take into account that new solutions come *"from working with physical artefacts and tools"* taking away the notion of the *"disembodied mind"* (Candy & Edmonds, 1999). The artefacts and tools designers use, such as sketching, are very visual and create an internal visual dialogue (Tversky, 1999).

Such a dialogue can also be created using collages as a means to structure and create typologies on different levels (Muller, 2001). The representation

of these typologies themselves has already been shown to have a beneficial effect on creative design (Pasman *et al.*, 1999). The activity of making these organizations offers even more potential for creative thinking (Pasman, 2003).

2.5.2 Collections and categorizing for creativity

Designers create collages to organize visual material and find new insights in the order that comes from that. The collages however are explicitly ambiguous and expressive, meaning that the categorizations are vague and ill-defined. In the classical view categories are arbitrary, having defining or critical attributes and intension (set of attributes) determine the extension of a category. The categories described here come from the natural view in which categories have an internal structure, centred around prototypes or stereotypes and instances of the categories exist in the periphery (Gardner, 1987). This natural view is what collages specifically support, even going so far to support making categorizations that would be seen as childlike mistakes in the developmental psychology of Piaget (Daehler & Bukatko, 1985).

Barsalou provides some clear example of how categorization in itself can be seen as a creative activity (Barsalou, 1991). In goal-derived categories the example is given of the category “*things to pack for a holiday*”. Though this is a simple description of a new category many aspects influence the outcome of this category (this is why so many mistakes are made in packing for a holiday). Imagine yourself packing for a holiday, you will probably first think some obvious thing such as clothes (a category) and by opening up your closet you will encounter elements and judge them for their appropriateness. Then, by laying them out on floor, table or bed you get an overview, which in turn sparks new ideas of things to pack. This example can go on and on, but bears many resemblances to the collage making task, manipulating existing knowledge to allow for new concepts and creating ad hoc categories that have stability in a moment but can become irrelevant when goals change.

The design methodologist Schön provides an interesting perspective on creative thinking in the Displacement of Concepts (Schön, 1963). By mapping one concept onto another, a new situation is created. Creative thinking involves trying to fit these different concepts on their attributes and associations. It is the friction and instability in these association clusters that brings new insights. This requires allowing for mistakes, which is a well-known requirement for creative behaviour (though mistakes do not guarantee creative outcomes).

In other words, metaphors can work, if you use them creatively or following Pablo Picasso’s famous quote “*Bad artists copy, good artists steal, great artists transform*”.

2.5.3 Collections of visual material

Eckert and Stacey describe how designers of knitwear actively search for inspiration by looking for, organizing and discussing shapes, patterns, motifs and colour combinations in other designs (Eckert & Stacey, 2000). A nice example of a very physical collection of materials collected for inspiration is the *Tech Box* by the successful design agency IDEO (Kelley & Littman, 2001). The *Tech Box* is a rolling cart containing many different innovative technological solutions, collected for inspiration. The *Tech Box* started out as a personal collection by an employee, but is now a formal part of the company's working method. The risk of shared collections is that only the extreme examples survive, leaving out the common objects, that might also allow for insights.

The media aspects of collections have, specifically, impact in finding back objects. Designers personalize their work environments such as walls and tables with all kinds of objects (Kolli *et al.*, 1993). These organizations also apply to clerical office workers (Lansdale, 1991; Malone, 1983), but with designers the elements are more diverse in appearance and nature.

Most research into image collections don't take into account these physical aspects. Cawkell cleverly notes the difference in literature in the term "image" (dry, technical) and "picture" (warmer, artistic) in which images are automatically assumed to be digital (Cawkell, 1992).

2.5.4 Tools and interaction

The influence of tools and interaction with our tools is often underestimated in practice. In the words of Marshall McLuhan "*We shape our tools, and then our tools shape us.*" (McLuhan, 1964).

Most computer tools don't support the conceptual phase of design because they expect the user to know what they want in advance (Stappers & Hennessey, 1999). Moreover computer tools currently don't support the expressive gestures and bodily interaction that is such an important aspect of creativity (Hummels, 2000). The ambiguity in sketches is an important tool for designers to bring out their ideas fluently and expressively (Gross & Do, 1996).

In our work, the main implications for and experiences with *sketchy* design tools are divided in aesthetics, interaction and usability (Keller *et al.*, 2000; Stappers *et al.*, 2000). The *aesthetics* of the rough concept sketch are a guiding principle in these tools. Where many computer tools offer an array of possibilities with their own aesthetics, tools for the conceptual phase should offer no other aesthetics other than the user's. The aspect of *interaction* refers to being sensitive to the input of the user with their richness of gestures in strokes and timing. For example, most computer interfaces do not take into account the mouse movement without selections, the location of selection within an object or the length of a selection. These interactions have meaning

and can be used as clues by computer tools. With *usability* we imply both a very focused functionality within tools, yet a high degree of freedom in how this functionality can be used. Accepting the fact that interfaces simply get in the way of our intentions, it is possible to hand over a limited set of functionalities to the user and allow for improvisation by the user beyond the original limits. An example of a tool that incorporates all three aspects of aesthetics, interaction and usability, allowing for an exploration of these aspects is given in the next chapter on the TRI Setup.

2.6 Discussion of the method

The method used in our case gave us a tremendous amount of material in a relatively short time. These materials consisted both of structured, concise aspects, written down in keywords on the Mind Maps, and on rich metaphors and experiences presented by the participants. By allowing our participants to choose their starting points and themes the initiative was continuously placed with the participants. Making more than one Mind Map made our participants go both broad into general issues pertaining the phenomenon, and deeper into specific aspects they chose themselves. In hindsight a third Mind Map might not have been necessary, but in their evaluation all but one of the participants (MS) said they did appreciate this. Our participants said they did enjoy the sessions themselves and found the Mind Mapping technique a powerful way of getting their ideas out of their system. One participant (TK) even referred to the session as a “*pressure cooker*” for his thoughts.

We initially selected Mind Mapping as our generative tool because we expected to get complete, comprehensive lists of aspects and specific references to literature. Neither of these results happened as expected; our participants did incorporate their own research problem in their presentation, but no specific references or projects were mentioned.

A structured interview would probably have resulted in more specific literature references compared to the result on the Mind Maps, but our method encouraged our participants to phrase their theoretical knowledge into the language of everyday experiences. The result of the mindmapping study could not be directly used to select or point at existing literature, but it did work as a bootstrapping technique to find the relevant aspects, themes and keywords.

The big advantage of Mind Maps over other generative tools was the relative ease in which we could structure and condense our results. The participants have provided both a set of keywords and a structure, which could efficiently be organized and compared to the presentations. In all, our sessions took only 8 hours with 36 hours of preparation. Structuring

and analysis took us 72 hours, and translating the outcomes to a theoretical framework and finding the relevant literature took us 80 hours. In total, we have been working for less than five weeks to get a framework that allowed us to continue our research on a solid basis. A traditional goal-directed literature search might have resulted in a more in-depth overview of literature in one or more disciplines, but we would not have been able to get both the breadth and the overlapping disciplines integrated in our literature field and it would have taken much more time.

2.7 Conclusion

We used participatory design techniques as a means to widen our scope on literature, yet to narrow down our research to a manageable framework. Using this method we were able to gain some insight on the phenomenon of how designers interact with their collection of visual material without getting caught in the bias of one discipline. Also, it changed our preconcepts: where we first looked into existing solutions for image management we now took in account that these tools might not be aimed at the goals of designers.

We have stayed close to the disciplines of design and human computer interaction, as this is our own discipline. Yet, without this study we wouldn't have been able to critically look at what defines a collection of visual material for designers and what aspects of use we should look at. This study took us from a focus on technical solutions for a possibly non-existent problem to a set of fundamental viewpoints on creativity in categorization and media aspects.

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