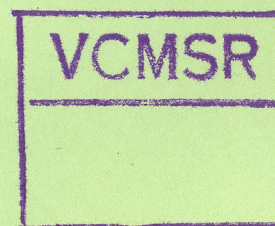




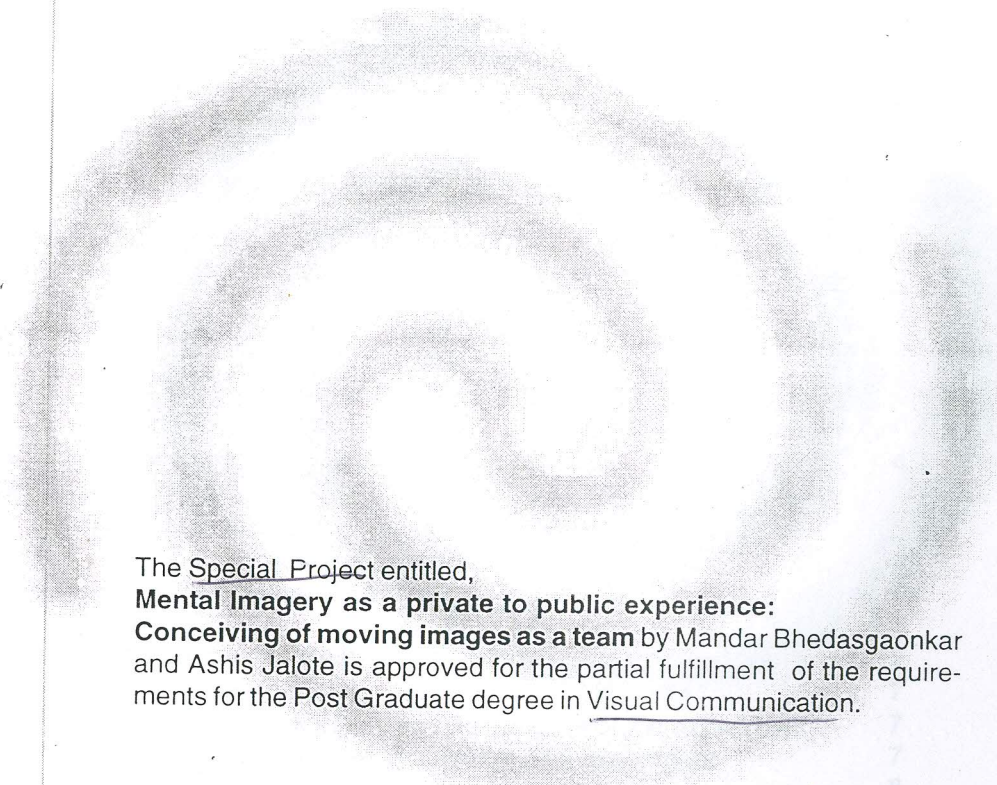
Mental Imagery as a private to public experience:
Conceiving of moving images as a team.

Special Project
Feb 2000



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Guide:
Prof Uday Athvankar



The Special Project entitled,
Mental Imagery as a private to public experience:
Conceiving of moving images as a team by Mandar Bhedasgaonkar
and Ashis Jalote is approved for the partial fulfillment of the require-
ments for the Post Graduate degree in Visual Communication.

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**Acknowledgment:**

Metal Imagery was just a 'term' floating at the surface level of our limited understanding, until we worked on this project with Prof Athvankar to discover its true depth and richness. We process this special project in the form of a paper to be submitted in an conference in Codesign 2000 for which a few experiments were conducted.

We would like express our heartfelt thanks to the eminent subjects, Mr. Amol Palekar and Ms. Shilpa Ranade for finding time to participate in the experiment. Also thanks are due to Mr. Kalwankar and the staff of Educational Technology cell for making the video link setup possible. A special mention to the librarian Shri M.B. Joshi and Shri Upadhaya for their perennial support. Special thanks to Prof Praveen Nahar, for lending his computer.

Mental imagery in Team Design - Premise.

Mental Imagery as a private to public experience.

Images prompted by words/phrases in the conversations were often accompanied by associated imagery. This leads us to several interesting questions. Do these words influence the mental imagery, teamwork and the design process in anyway? If yes, can the influence be analysed to draw some productive inferences?

Is the mental imagery formed in the mind of the designer as his private experience as richly communicated to the partner? Sketching is a very important mode in making this private experience public; but in this case it did not play a important role in communication. Thus it leads to ponder upon the effectiveness of making the private experience of the imagery public and its effect on the team design process. Research is taking place in these areas to establish facts further.

Some already established facts about imagery form strong views about Creativity and imagery. Often one wonders Does creativity depend on Imagery? Can discoveries be made in imagery?

Einstein and many others (see Shepard's 1978) have claimed that their creations began first as images and only later were transformed into words. If imagery has precedence in creative discoveries, why do people sometimes have difficulty 'seeing' information in their visual images that they readily see in perception?

Do our expectations effect what can be discovered in or learned from images? How do creativity, discovery and imagery intersect?

These intriguing questions have long tantalised psychologists and others interested in creativity. Despite the extensive history of creativity discovery and imagery as phenomena in need of explanation, relatively little progress has been made in answering these questions until fairly recently.

Role of Imagery in Team design

The nature of image formation is relevant to any study of thinking, emotion and perception. A short example, and perception. A short example can illustrate the important cognitive issues. A man chased by a lion will retain an image of the lion rather than looking over his shoulder to remind himself why he is running. The image has information derived from perception, which in turn motivates continued action for escape.

Any thought representation that has a sensory quality we call an image. Images can involve the senses of seeing, hearing, smell, taste, touch, and movement: but since focus is on visual images, The uses of the word "image" for mental contents that have a visual sensory quality (unless otherwise indicated) refers to different types of image experience collectively.

A person can describe an image in many ways, including information about contents, vividness, clarity,

color, shading, shapes, movement, foreground and background characteristics, and other spatial relationship. Further more a person can often tell how the image entered his awareness, its duration, associated emotions, the change or dispel it, and the sequential or simultaneous arrangement of series of images. Now however recently theoretical developments coupled with a growing database suggest that it is desirable to bring together relevant research to access theories and to chart some courses for the future.

Analysing the obtained discription of these team designing reveals different patterns of behaviour. These patterns of behaviour arouse an interest in a more detailed and in-deapth analysis of team design behavior (c)1998 *etsever science ltd*. Keywords; design activity, teamwork, reflection in action, protocol analysis research method.

For team designing to be effective we rely on team members to support each other in answering questions that arise and in picking up lines of thought from each other to be build on. This should give an added value compound to individual designing, where the designer creates his/her own private understanding of the design problem and the design solution.

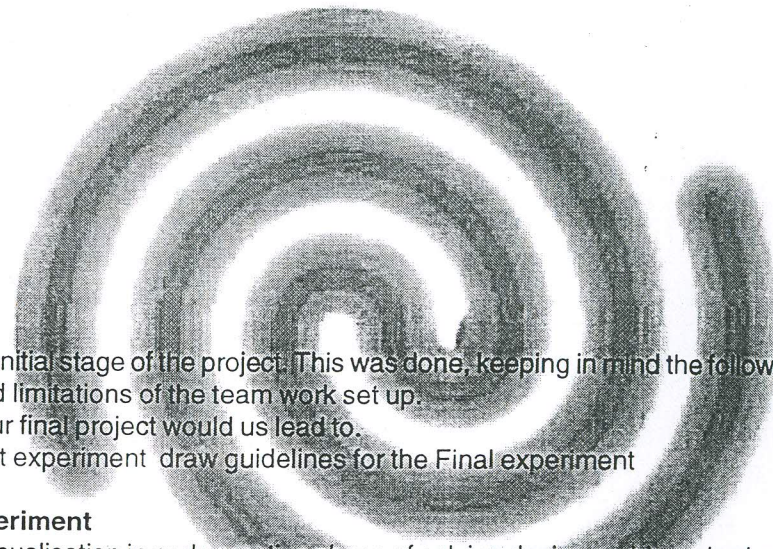
We need to describe and analyse team working on design projects, to see where and why problems occur. *Schions theory* is based on constructionist view of human perception and thought process.

A designer is actively constructing a view of the world based on his/her experience. The descriptions provide us clear view of team design strategies, and as such they could be used in design education. But to improve design theory and education systematically we need to make a transition from pure discription to prescription. We need to further analyse and discuss the general patterns that occur in the discribed teams. Looking in deapth at the data the above statenments might be refined into hypottheseis, that should then be treated in further experiments.

Scope of the project:

Analysing team design efforts

The role of mental imagery and visualisation in early creative phase of solving design problems is already acknowledged. But mental imagery is a personal experience. This project investigates the potential issues created by lack of access to the imagery of the partner, in team design efforts. Aim of the our project is to analyse the proceedings of imagery process in the team design in the chosen parameters and then offer some insight in developing tools and guidelines to improve it.



Pilot Experiment

Purpose:

We conducted a pilot experiment in the initial stage of the project. This was done, keeping in mind the following-

- a) To analyse the true nature and limitations of the team work set up.
- b) To write an abstract of what our final project would us lead to.
- c) Finally on the basis of the pilot experiment draw guidelines for the Final experiment

Background and process of the Experiment

The role of mental imagery and visualisation in early creative phase of solving design problems is already acknowledged. But mental imagery is a personal experience. These two papers investigate the potential issues created by lack of access to the imagery of the partner, in team design efforts.

In the pilot experiment's team of two designers were given a design problem (referred as designers A & B). They worked in usual but physically separated work environments. They could only communicate and view each other's sketching through video conferencing, while the protocol are recorded on a video. They were briefed and were asked to work on the design problem simultaneously as a team. The designers' mental imagery experiences were accessed by interrupting the design process at intervals. They were interviewed them about their own, as well as their perception of their partner's imagery.

Design problem for the pilot experiment.

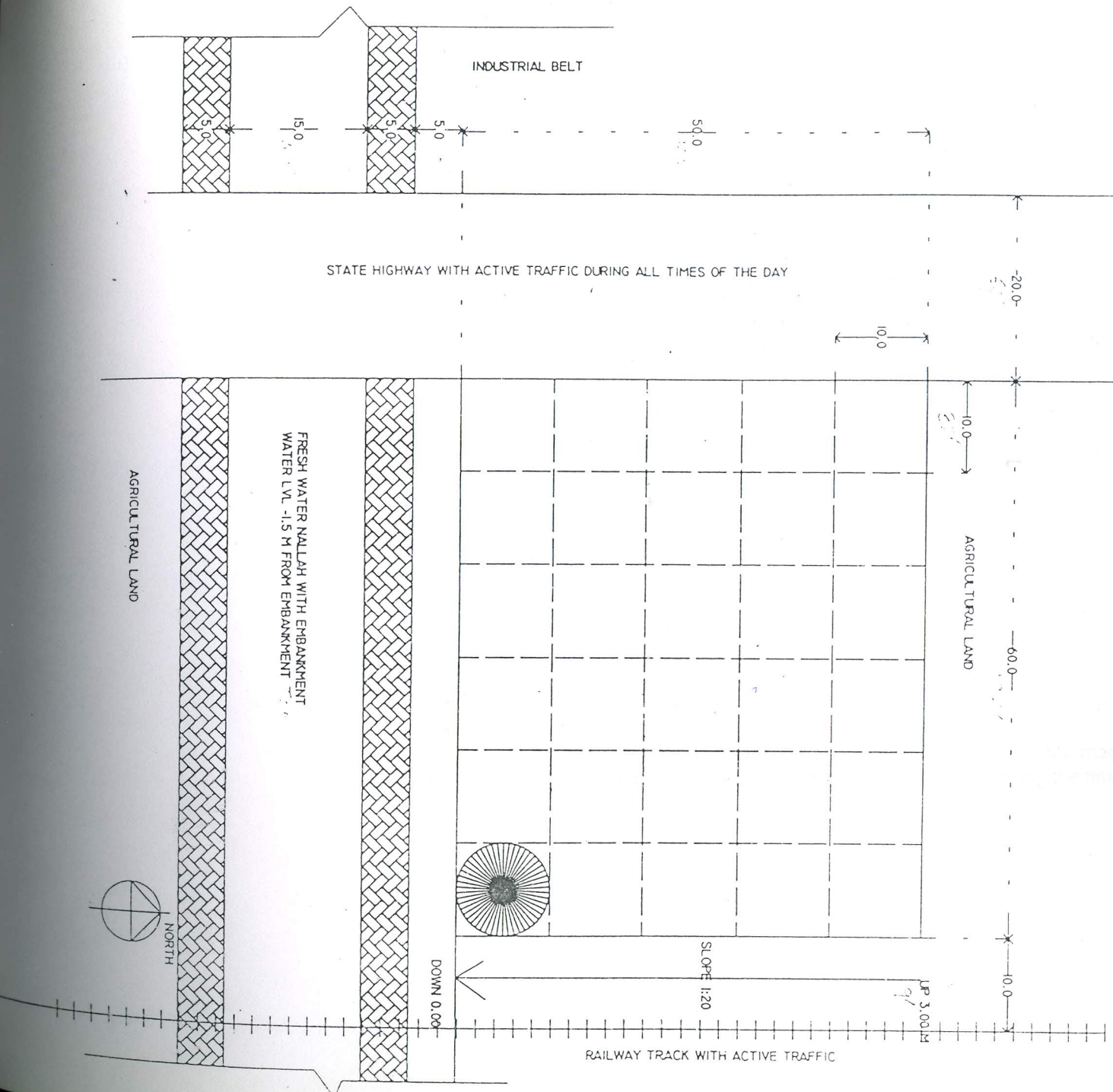
Design a motel on the site located on the "Bombay Goa highway" in Chilplun village. The plot is approximately 3000 sqm. It is a rectangular site a shown in the attached sheet. The highway runs along the West Side of the plot. On the eastern side of the plot a railway track runs parallel to the plot. There are farm lands on the north side of the plot. On the south there is fresh water nallah parallel to the plot. Across the nallah are farmlands. Across the highway on the West side there is an industrial belt.

Constraints

- 1) Material should be locally available.
- 2) The height of the structure should not exceed g+1

Climate

Hot humid, heavy rains during monsoon.



Spatial requirements

- 1) Reception
- 2) Lobby to convey the culture and essence of the region.
- 3) Double-bedded AC rooms with balcony
- 4) Single bedded AC rooms
- 5) Double -bedded non AC rooms
- 6) Interaction spaces- lawncourts.

Services

- 1) Kitchen with store
- 2) Dining room with bar for all the guests
- 3) All rooms have a toilet attached.
- 4) Parking lot for 20 cars 5 buses
- 5) Toilet facility for general visitors

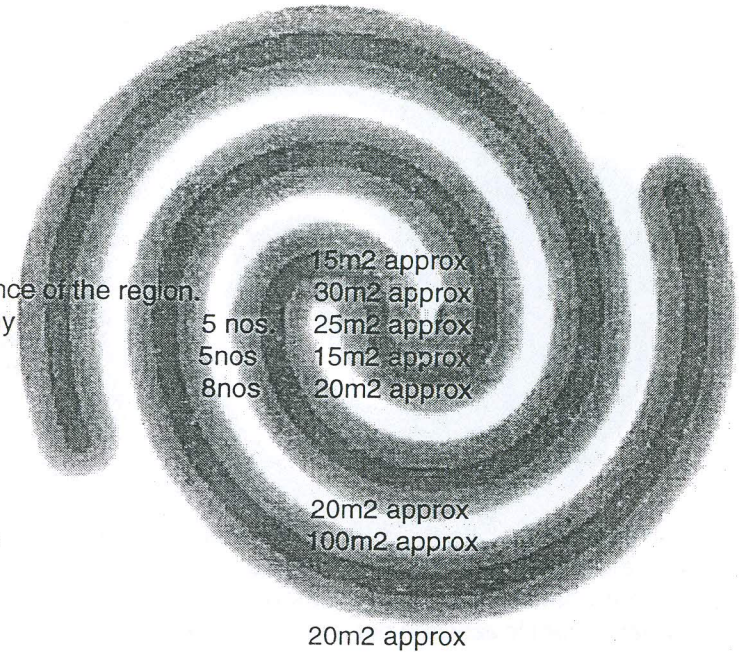
Subjects

Mukta Hiremath
Hrishikesh Deshmukh

The analysis involved

The analysis involved were base on the following

- a) Comparing the descriptions of the current status of the creation as separately described by A and B during interval
- b) Comparing A's imagery experience with B's perceptions of A's imagery and thinking, and vice versa.
- c) Studying the partner's individual images for similarity, along the timeline as the design proceeded.





Abstract

Title : Mental Imagery as a Private to Public Experience
(Conceiving of moving images in a team)

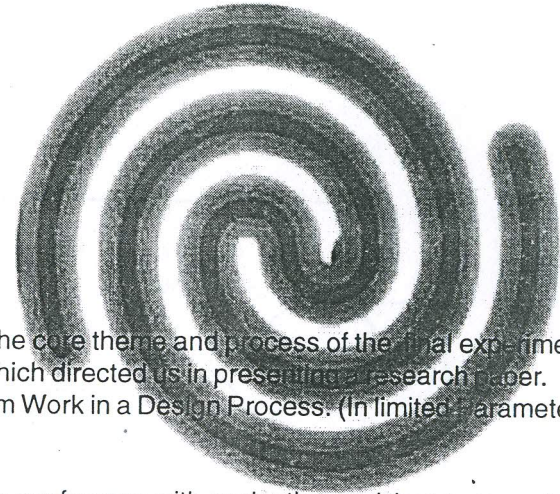
Authors: Mandar Bhedasgaonkar

Ashis Jalote

Prof. Uday A. Athavankar

In the pilot experiment, a team of two visual communication designers was asked to design a video film. Findings show that private imagery experiences remain only partially accessible to the team members, and these inadequacies have serious implications on the synergy of the teamwork. Access to each other's descriptions as well as sketches were in no way adequate to understand the details and the richness of their personal imagery experiences. The vital details such as understanding of the size, scale, proportion and 3-D movement of the objects, background music, and light conditions were seldom communicated making way for ambiguity and assumptions. Both the designers had to share the effort to discuss and sketch, while continuing their mental involvement in creative effort. Besides personalisation of the language- imagery relationship as well as vagueness of the sketches made access to other's imagery more difficult.

This paper will conclude by speculating on possible solutions to bridge the communication gap in the team design process and by discussing implications of these findings on visual design education programs.



Final Experiment

Purpose:

On the basis of the pilot experiment we extracted the core theme and process of the final experiment. Also we clearly defined the channel of our investigation which directed us in presenting a research paper. This would contain the possibilities and limitations of Team Work in a Design Process. (In limited parameters)

Set up and process of the Experiment

The experiment required both the designers to video conference with each other and then communicate to design. Thus keeping in mind the basic requirements of video conferencing a set up was created. There were two separate unit set up for the two designers to work in. Identity was not to be disclosed therefore proper measure were taken for the same. Each unit had a work environment with a working table with a monitor and a mike with camera focused table (to keep the identity undisclosed). This entire problem solving session will be recorded on a separate video tapes.

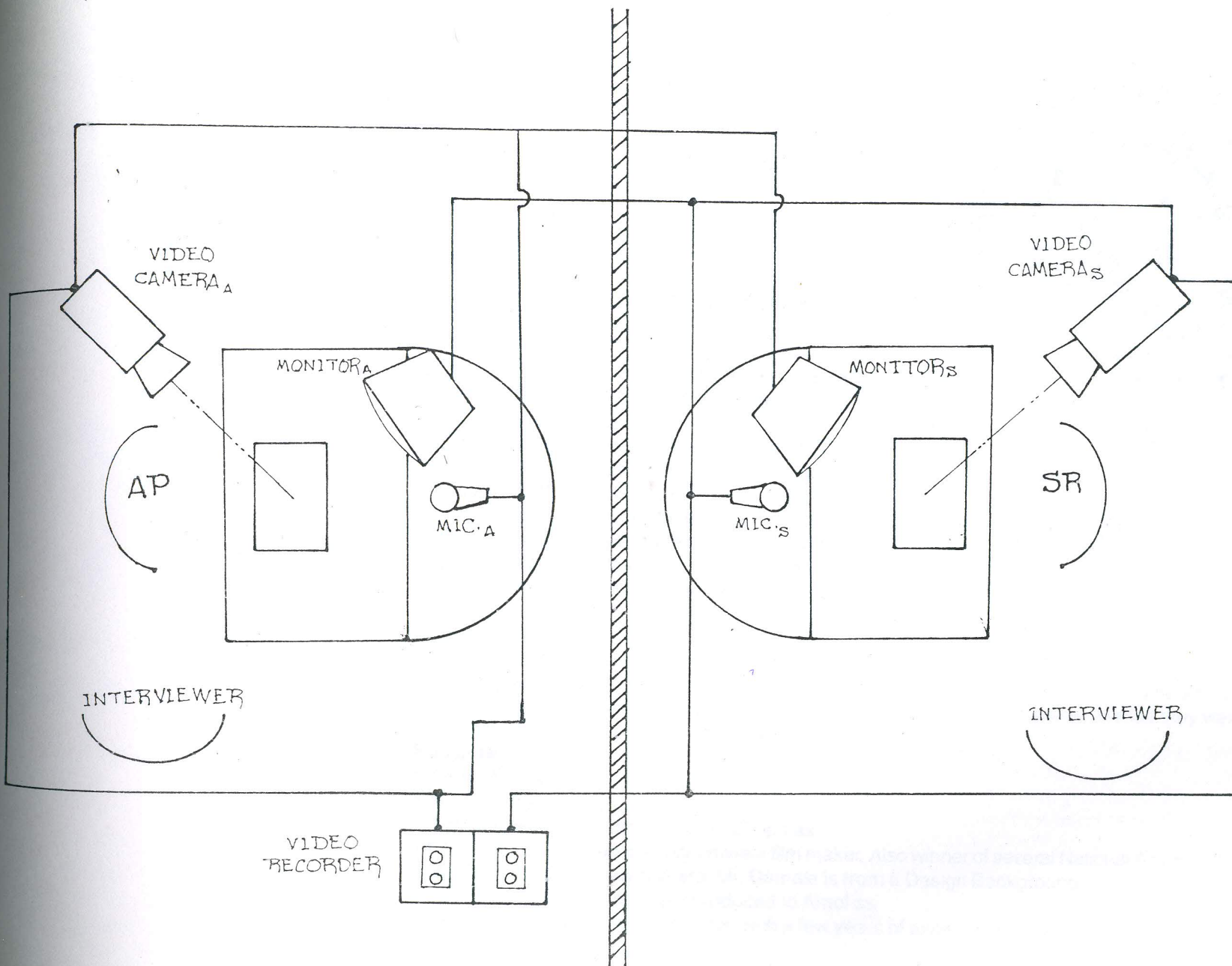
Equipment in each unit

- 1) Bitacam cameras on moving stand, with inbuilt mike facility.
- 2) Mikes
- 3) Digital clocks
- 4) Monitors with speakers
- 5) Connection cables and separate recorders for both the units.
- 6) Stationary

There were a few pauses given in the entire problem solving process to question the designers about their mental imagery retrospection. After analysing the pilot experiment the shortcomings were rectified in the final set up.

Problem: Analysis was a slightly weak due to lack of time stamp in the video tape of the pilot experiment. Thus it made it very difficult to analyse the protocol to the minutely (minute by minute)

Measure: We added a digital clock to set up. This was placed on each work table so that it could be viewed in the video.



SCHEMATIC DIAGRAM OF EXPERIMENT SET-UP



Design Problem:

To make a short public awareness film, to be screened on a TV channel on Prime Time.

Subject: Female Infanticide.

Quite often these days ultrasound centers are crowded with young parents eager to know prenatal sex detection. If the sex is determined as a girl, ...in many cases the foetus is aborted immediately. Despite the efforts of the Government and voluntary organizations, female infanticide (FI) had not declined. Instead it had spread from the existing pockets to the contiguous areas. According to Commissioner for Maternal and Child Health and Welfare this forms an 'FI belt'. The Government is concerned about this and had started initiating steps to curb the practice.

According to the current data, Tamilnadu, North / Northwest India (Haryana, Punjab, Western UP, Rajasthan, ravine areas of Madhya Pradesh etc.) has long had the highest female death rates. With the result the number of girls per 1000 population are far fewer than the boys.

The experiment expects the team to evolve the idea and story board/ script through a joint discussion.

The Team Introduction:

The true identity of the designers was not disclosed to each other, because this could affect their working style. i.e. if they were known to each other they would then react and perform in an different tone all together. Therefore it was one of the restrictions which we found necessary to imposed. Hence they were introduced by fake names, retaining their true qualifications.

Subjects

Mr Amol Palekar

Mrs Shilpa Ranade

Mr Amol Palekar was introduced to Shilpa as

1# Mr. Ramesh Damale is a very eminent film maker, Also winner of several National Awards. Has been involved with film making for many a years. Mr. Damale is from a Design Background.

2# Mrs. Archana Kulkarni was introduced to Amol as

She is a young budding Film Director, with a few years of experience in this field. Has won awards for her films having a strong design background.



Analysis

The protocol was video recorded. The interviews of the two designers in the pauses were also recorded. There was enormous amount of data generated regarding the mental imagery as well as on the team design process. Some interesting observations were also made.

This data was analysed by viewing the video tapes. A special tabular format was prepared to assist in the analysis. (As shown in the annexure) The proceedings were recorded as per time stamp. The important statements (Key Words) of the two designers were noted along with the imagery associated with the statement. During the time of the pauses the 'Keypoints' were used to pose questions to the designers asking them to recapitulate their imagery at the point where they mentioned the particular word. The partner's imagery associated was also noted against it. This helped in comparing the imagery experiences of the two designers as well as their understanding of the partner's imagery.

This analysis opened new doors in the field of mental imagery and its role in the team design effort. We worked on very broad categories and analysed them to prepare the scratch data. This was then refined further to present it in the form of a paper.

The following points were noted in the analysis

The images were seen as events and not as static images.

Word Imagery Relationship

The analysis clearly showed the relationship between the words or phrases used in the conversation and the imagery. The words or phrases in the conversation many a times prompted imagery to the designers, but imagery experience for the partners was never same. The difference varied from slightly to substantially depending upon the type of words/phrases.

Stereo type and team communication issues

Occasionally, the references to the mental imagery in the narrations were inadequate and it led to ambiguity. Typically the partner reacted to this ambiguity by bringing elements from his/her own image bank (i.e. previously stored experiences) to complete the picture. This imagery was largely dependant upon one's own cultural background.

Development of the idea and transformation of the images

It was observed that the team members were deeply involved in the design process and many a times they referred to the incidences in their own life and placed themselves as the characters. This was seen mostly in the initial stage and in the later stages they replaced the characters with the hypothetical characters



Total time span: 00:00:00 to 02:14:22
 134 minutes Experiment time (Inclusive of Pause time)
 71 minutes Pause time

Protocol	Time(min)
Stage 1	24
Pause 1	31
Stage 2	22
Pause 2	18
Stage 3	13
Pause 3	20
Stage 4	03
Pause 4	03

according to the context and reference.

The analysis also threw light on the continuity of images in the process. It was seen that some of the images formed in the initial stages persisted till the end of the design session unless they were changed by the partner.

An interesting observation in this experiment was that the designers imagined the soundtrack also. This was a unique feature of the imagery of the film designers. Also in the later stages, as the scheme of the film crystallized, they started seeing the images as if through the camera. It is interesting to see the development of relationship between the partners. During the process both the partners formed a bond between each other. This helped in establishing a good team spirit.

The past experience of a designer plays very important role in his imagery experience as well as in taking technical decisions for the film making. Some very surprising facts regarding the imagery such as vividness of the images, emotions in the imagery and role of fantasy in the imagery were revealed.

These analysis were then further refined to draw the guidelines and conclusions for our research paper.

Chart used for analysis

TIME	DURING DESIGN		REPORT				REMARKS
	AP	SR	AP		SR		
	STATEMENT/SKETCH	STATEMENT/SKETCH	OWN IMAGERY	PARTNER'S IMAGERY	OWN IMAGERY	PARTNER'S IMAGERY	
00:51:52	Talking to celebrities Having only one daughter		Pandit Nehru & his daughter Indira Gandhi		Shah Rukh Khan featuring in Pulse PolioCampaign		



Mental imagery as a private to public experience

Conceiving of moving images as a team

Authors: Mandar Bhedasgaonkar

Ashis Jalote

Prof Uday Athavankar

1.0 Co-design: Sharing imagery?

Typical attributes of imagery, such as spontaneity, nonlinear nature, deceptive qualities and the possibilities of voluntary control, point to the enormous potential of imagery in the development of ideas. There are of course few references but they deal mainly with imagery experience of individual designers and show how private experience like mental imagery plays an important role in the early creative pursuits. Even though most of the designers personally experience images during problem solving, the current literature in this field is rather limited. Besides this material does not deal with the modern trends like team design efforts.

Modern design is increasingly being viewed as a team effort, and the team members often use their individual expertise in interacting across the globe to generate new ideas. This trend has raised some interesting questions.

If a private experience like mental imagery is so significant in problem solving, how can a team ever function? Would they be forced to share their imagery experiences with their team members?

The problem is even more complex when distances and cultures separate the teams! Making a small team of two eminent filmmaker's attempts to explore the unfamiliar territory of the role of mental imagery in team efforts.

The exploration of the role of imagery in creative process has extended beyond the investigations in literature, artistic achievements and scientific discoveries. These studies have thrown light on how creative process can benefit from imagery. Robert McKim was first to view it from the point of design tasks and saw mental imagery as a component of visual thinking. (McKim, 1972). He realised that the creative efforts in design need learning to voluntarily control and manipulate the mental images. In visual arts area, Arnheim pointed out its role as a vehicle of thought in visual arts. (Arnheim, 1969)

There are two unique characteristics of mental imagery that one must understand. First, experiencing of the mental images is so well integrated with the thinking process that most people are not even aware of it. Second, it remains a



private experience inaccessible to fellow partners. In spite of the significant role that mental imagery plays the inaccessibility of these private experience turns to be a major deterrent in its systematic investigation.

Experimental explorations of imagery and creativity are not new to research literature in cognitive science and design. The research focus shifted to mental imagery studies when Shepard and later Kosslyn made important contributions to the understanding of the nature and properties of imagery. Their work showed that images, like other mental events, are real psychological entities that can be studied, measured and theorised about. (Shepard & Merzler 1971, and Kosslyn 1980)

The current focus is gradually shifting to the study of synergetic relationships between creativity and imagery. Some of the work done by cognitive scientists has provided ample inspiration to the design researchers in this field. (See compilation by Roskos-Ewoldsen et. al., 1993). Two specific areas from this work seem to have influenced design research. The first deals with the mental synthesis of component parts, where subjects are asked to mentally combine given parts to create useful objects. The second deals with discoveries inspired by figure reversal and reinterpretations.

There are a few attempts, which indirectly catch the imagery experiences during the early phases of design problem solving process. (Athavankar 1997, Singh 1999) These have yielded some useful information on the role of mental imagery in the act of design. However, these studies are restricted to experiences of individual designers. While they do offer help in the development of experimental procedure, there is very little that these studies offer in answering questions that we have raised at the beginning of, this section.

This paper attempts to address the issues dealing with sharing of private experiences like mental imagery by simulating the creative process, where two film makers work at distant locations but are connected by a video-link. The paper explores 'issues' that the sharing or not sharing of private experience would rise in team design effort. We will turn to the team issues after we briefly review the work on mental imagery.

2.0 Experiment: Capturing the inaccessible

The team consisted of two matured professionals as subjects. Mr. Amol Palekar (referred as AP) is a very eminent, well-known filmmaker. He is also a winner of several National awards. He has been involved with film making for many a years and has a design background. The second subject, Ms. Shilpa Ranade (referred as SR) is a young, budding filmmaker, with a few years of experience in this field. She has also won awards for her films and has a strong design background.

2.1 Design problem

The subjects were asked to make a short public awareness film on female infanticide, to be screened on the national TV channel during prime time and, if time permits, develop a story-board together for a film. A written brief was given

simultaneously to both the team members.

The subjects were ushered into two different rooms and their identity was not revealed to each other. They were given assumed names. The simulation of distant interaction was implemented as follows. Each room had a worktop with normal stationary required for sketching. The video-link ensured that the sketches as well as conversations were available to both the members on their respective monitors. The camera angle ensured that the person's identity was not revealed. They were told that the study deals with the team process, but the focus of the experiment on the imagery was not revealed to them.

2.2 Accessing mental imagery

As mentioned earlier, a private experience like mental imagery remains inaccessible to outsiders and could be only accessed through immediate retrospective reports given by the subjects. In the earlier studies on individual designer, Singh (Singh, 1998) has used retrospective report, based on showing the video replay to the subject at the end of the session, as a strategy to access imagery experiences. But to avoid the subjects from relying too much on memory of the session, intermediate pauses were introduced for retrospection, mostly at the competition of important arguments. But to ensure structured comments, the two experimenters noted the clues such as key words and phrases from the conversation and used them to elicit retrospective reports from the two subjects.

On the face of it, use of intermediate pauses may appear as unusual interruptions, but the earlier pilot studies showed that such brief pauses were not a major hindrance in the continuity of the process. In the entire 134 minutes session four pauses were used, obviously the last one being at the end of the session. (The total time of the problem solving session is 64 minutes plus the time included for the pauses) The narrations of subjects during the pauses were video recorded.

The intermediate pauses gave information rich report due to the recency effects in the memory. There was another important advantage, because the subjects had no idea of what they would do subsequently, they had no opportunity to use 'relevance' of the imagery experience as a filter in their retrospective reports.

3.0 Probing into the mind's eye experiences

The findings of the experiment offer interesting insights into the imagery experiences that these two designers went through. They also throw light on the problems as well as opportunities in sharing images that the team interaction offers. We have attempted to group these observations into five broad categories.

3.1 Word imagery partnership

Images prompted by words/phrases in the conversations were often accompanied by associated imagery. This leads us to several interesting questions. Do these words influence the mental imagery, teamwork and the design process in anyway? If yes, can the influence be analysed to draw some productive inferences?

Two aspects seem to have mattered in these relationships. First, deals with the role of the team member, as a speaker or a listener. Second, the nature of the word used. The abstract words gave a different experience when compared to concrete words/phrases. Since the analysis depends largely on retrospective reports, a systematic study of differences between the imagery experiences of abstract and concrete word is not attempted here. It would be sufficient to state that as expected, there was a greater variation in the imagery experiences, when the abstract words were used. There are a few interesting variations in the word-image relationships, which are worth noting. Let us consider some of these variations.

Case 1- There are several instances where the speaker experienced certain imagery, while his words prompted the partner, leading him to experience a slightly or substantially different imagery. For example,

[00:13:50] AP: He recalled his experience in Russia and said, "15 years ago when I visited Russia ...I remember seeing the women doing all the work and managing everything."

AP was reminded of his trip to Russia, where he saw women wearing work-pants working as truck drivers and managing almost everything. AP also saw himself on the glittering street early in the morning when operation cleanup, was on the move. In AP's report during the pause, these women were operating water tankers and cleaning up the streets with big brown scrubbers. They were tough and hard and their faces were as hard as that of any Indian heroes. But these women were not carrying any bravado on their faces.

To SR, the word Russia evoked images of her visit to Tashkent in which she viewed faces of women, which were strained and tensed. These women were wearing uniforms working in the duty-free shops. Strangely SR's images were viewed from standing at the airport and this entire area was quite dark.

Images of people seen in these reports are quite similar to the images AP had seen, except that SR's images were restricted to the Airport. But they did defer in their context and settings. Would the team work effectively if the contextual experiences were not shared? We will return to this argument later.

Another interesting example triggered by an abstract word from the protocols is when they were discussing a new approach to the theme

[00:56:52] AP: While discussing a new approach says, "Celebrities can be made to talk about it".

Here, AP had imagined celebrities like India's first Prime Minister Pundit Nehru and his daughter Indira Gandhi as celebrities. On the other hand SR had a typical image of popular film star Shah Rukh Khan as the celebrity and it also brought to her images of 'Pulse Polio Campaign' in which he had featured. Speaker's words may not capture the associated mental imagery experience. So, the resultant images in the partners' mind often vary. Though the imagery interpreta-

tions, particularly of abstract words, were interesting and potentially useful for the development of the theme, these images remained very private, unshared personal experiences for both of them.

Case 2- Protocols show instances where the speaker experienced rich imagery when he spoke, but the words failed to prompt similar response in the partner. In the example we have picked up from the initial part of the protocol, there was an argument between the team members on alternative approaches to the theme. During this discussion, both the designers used many abstract words or phrases. Interestingly, only the speaker experienced a very rich imagery when he spoke, but the partner did not experience anything. For instance,

[00:18:42] AP: When he continued the argument based on the example of Russia and said, "It is a fact that girls are fewer than boys and hence by the rule of 'Demand & Supply' they have to be valued."

These words were accompanied by an image of a typical local rationing shop with long queues representing the scarcity of commodities, but no reference to this occurred in his narration, nor did his statement prompt any imagery to SR. Such event is unusual at all. For instance,

[00:08:42] SR: "One film cannot make any change"

At this time, SR had imagined cigarette packets printed with the ill effects of smoking. It was seen that the partner did not have access to this imagery.

So far we have listed few instances where the speaker had some mental imagery experiences but were never conveyed to the partner. This could happen probably because the speaker found his own experience not relevant and did not see the reason to include them in their narration's. What are the implications of such individual judgements to the teamwork, where sharing seems to be an important issue? The point could be argued from both sides. The pressure to consciously speak about your imagery experiences could actually hamper the speaker's flow of thoughts and could adversely affect his participation. The retrospective reports suggest that not to mention some of the private experiences is quite usual. On the other hand, even if the speakers perceived these images as not so relevant, all of them had potential seeds for new directions and partner could have taken off from these images. Indeed the protocols do suggest such synergetic effects are not too uncommon, a topic that we will deal with in the third case.

Case 3- There are instances of the words which triggered rich images in the partner's mind without prompting the speaker to experience any imagery. For instance,

[00:21:54] During the conversation on the issue of female being the weaker sex, AP used an interesting phrase "Darwin's Theory". This did not trigger any imagery in AP's mind.

However it produced rich and somewhat strange imagery experiences in his partner's mind. SR, his partner, saw the cave women sitting in the cave in front of the fire. She had a baby in her lap while she was cooking and a few other children were playing around. Surprisingly, she reported seeing these images as caricatures rather as the images of the real world event. This example shows an interesting and positive aspect of the team conversation, which has a tendency to broaden

the imagery canvas of the partners. The role of mental imagery experience on the communication is worth dwelling on, a point that we turn to now.

3.2 Stereotypes and team communication issues

Occasionally, the references to the mental imagery in the narrations were inadequate and it led to ambiguity. Typically the partner reacted to this ambiguity by bringing elements from his/her own image bank (i.e. previously stored experiences) to complete the picture. **[Annexure1]**

[01:44:40] AP: Described and sketched the central character in the film as a North Indian rural woman, in her thirties wearing a dupatta covering her head. He further described her as frail, and carrying a strained look on her face. The pain that reflected on her face came from the past dilemma that she had borne in life so far.

Reacting to this, SR immediately imagined the women to be from Punjab, although this woman could have come from anywhere in North India. She seems to have assigned the location on her own and is most likely to reflect her mental stereotype of North Indian women. There is another interesting example, which explains this further. AP referred to the characters in the film as middle or lower middle class man and his daughter. [01:46:39] Taking a clue from this, SR conjured up a daughter's image based on the stereotypes that she was familiar with, but did not detail it out in her conversation. Later while summing up the final idea of the film [02:11:17], when she referred to "A middle class girl... may be from Mumbai", she had an image of a girl with plaited long hair. This stereotype image seems to have come from her own understanding of cultural environment in-Maharashtra. It is not uncommon to find images based on such stereotypes of places and characters, which seem to come from the cultural backgrounds of the team members. If stereotypes have an important role in communication, could this lead to communication breakdown in global teams, where the members do not share common cultural background?

3.3 Transformation of ideas and images

In the initial stages of the problem solving process, there were arguments on various approaches for the film. Towards the end of the process these differences got resolved. The ideas evolved through discussions, gradually converged on to a refined concept for the film. The analysis of the design process from initial stages to the end reveals that there was a gradual transformation of imagery as well as the relationships between the team members. We now plan to focus on some of the important points in this transformation, particularly from the point of view of imagery and teamwork.

3.3.1 From personification to characters

Film has a temporal structure. So, the imagery did not occur as static events but as a sequence of images or events. In the early stages, many of these events were rooted in personal life of the team members. These events helped in offering ideas

of theme development as well as in resolving issues.

[00:57:36] AP, in continuation of his idea about talking to celebrities (As mentioned earlier in { 1.2.2 }) having daughter as the single child said, "I remember when my own daughter asked me "was I ever disappointed in having daughter as my only child?"

A careful look at the protocols shows that these initial ideas were largely based on personification. Large part of the conversation often referred to his personal experiences with his daughter [00:57:36]. Later during the pause he reported that he saw him and his daughter in familiar settings. As the discussion proceeded, these images were replaced by well-characterised middle/lower-middle class man and his daughter. The initial personal identification with film story was highly imagery driven and this also helped the team to broaden the imagery canvas. It could have been because, unlike the films based on a book or a story, only a theme was given and the team was supposed to develop it further on their own.

3.3.2 Persistence of images

In the discussions during the second pause, SR reported that she had modelled the central character of the film by forming an image of her partner as a middle class man. SR had intuitively formed AP's image, probably guessing from his accent. (Which was the only accessible source of information) She reported that she had imagined this man to be a light eyed, light skinned Maharashtrian man in his early 40's, wearing a bush-shirt and trousers. Even though towards the end [02:11:26] SR recognised AP accidentally, the earlier image lingered in her mind and she continued with it while summing up the film at the end of the session.

3.3.3 Imagery and film grammar

Both the designers simultaneously indulged in the visualisation of soundtrack somewhere during the third stage, as the idea of the film started crystallising. When AP referred to a father conversing with his daughter [01:36:36], SR imagined the sounds of father and daughter talking and laughing. She also heard happy sounds and tinkling of bells. But the soundtrack experience was never communicated to each other. Initially the discussion was directed more towards bouncing of ideas and logical arguments, but gradually focus shifted to the basic film grammar. So, the sound tracks and the camera angles appear in the discussions. Probably because the concept of the film was almost crystallised, the team had started viewing the events as if seen through camera as well as hearing the sound track, leading to a discussion on this very topic. This is obvious in the protocols, when SR discussed a lady character, looking straight into the camera and talking her heart out.

3.4 Experience always intrudes

We have reported several examples where the designers dug into their past experiences, either for an effective approach

for the film or for evaluation of the idea. e.g., [00:23:50] AP recalled his visit to Russia 15 years back, (As already explained in 3.1) or when AP saw himself with his daughter. Interestingly, some of these memories dealt with earlier experiences of filmmaking, which influenced their evaluation of the current proposals. Much of this was actually imagery driven.

For instance, AP put forward his stand [01:48:26] that the subject should not directly look into the camera at any point of time hence avoiding flaunting looks. This observation was due to his previous experience of making an advertising film. In another example [01:39:32], when SR Described the image of an urban working woman who had gone through abortion, SR said ".... She is standing lonely at a bus-stop...."[01:39:32]. AP tried to compare it with his earlier use of similar shot to see how effective it could be. Thus, it can be seen that the team members tended to fall back on their past experiences as reference from which they could evaluate their partners as well as their own ideas.

3.5 Vividitiy, fantasy and emotions

Unlike perception, mental images have very different and somewhat strange qualities such as vividity, fantasy and emotions. It is difficult to comment on these reports, but all the same they are worth documenting here. SR reported seeing vague or blurred images during discussions, occurring like passing thoughts, though there are no references to this in the protocols,

[00:08:52] While arguing on the issue of defining a target audience for the film SR said, "One film cannot make a difference".

Later during pause, she reported seeing not so vivid flashes of 'No smoking' campaign in Canada, where the cigarette packets were printed with the ill effects of smoking. Such experiences are not unusual in mental imagery.

Imagery and fantasy are closely related and this does reflect in some of the imagery experiences of the filmmakers. E.g., During the first session AP used the term "Brahminical structure" [00:24:40]. He reported later during the pause that he had imagined a male Brahmin as a superman as if someone next to God, huge in size and all the other people looked like tiny little insects before him. This seems to be a manifestation of his fantasy.

In the initial stages of the discussions of the film two directions were explored, factual and emotional. The imagery experiences of both the designers portray high emotional traits. AP tilted the final choice toward emotional rather than a factual film. Perhaps this is what prompted them to dig into their own life experiences and use them to develop the ideas further.

4.0 Conclusions

Our observations on imagery come mainly from reports during pauses and wherever possible they are cross-referred to the protocols of the session. The focus is on the imagery experiences, though the discussion occasionally drifts to the

other aspects of the teamwork. We had started with questions on the role of imagery in the early creative efforts. We do not claim to have clear answers to all of them, but the results do offer some pointers. It is quite clear that imagery was central to the development of the initial approach at an individual as well as at a team level. During the later parts, imagery was also important to the development of the film grammar. For filmmakers, the imagery is not seen as static but is more perceived as a sequence of images, sometimes with a soundtrack.

It must be noted that number of these images remained as private unshared experiences between the team-mates. We will return to the implications of this point later. The words in the conversation also appeared to be central to the imagery experiences of the listening partner and often prompted him to conjure up new Images. As a result, it broadened the imagery canvas of the team-mate, more so when abstract words were used. This appears to be the most important and positive contribution that imagery makes in the team process.

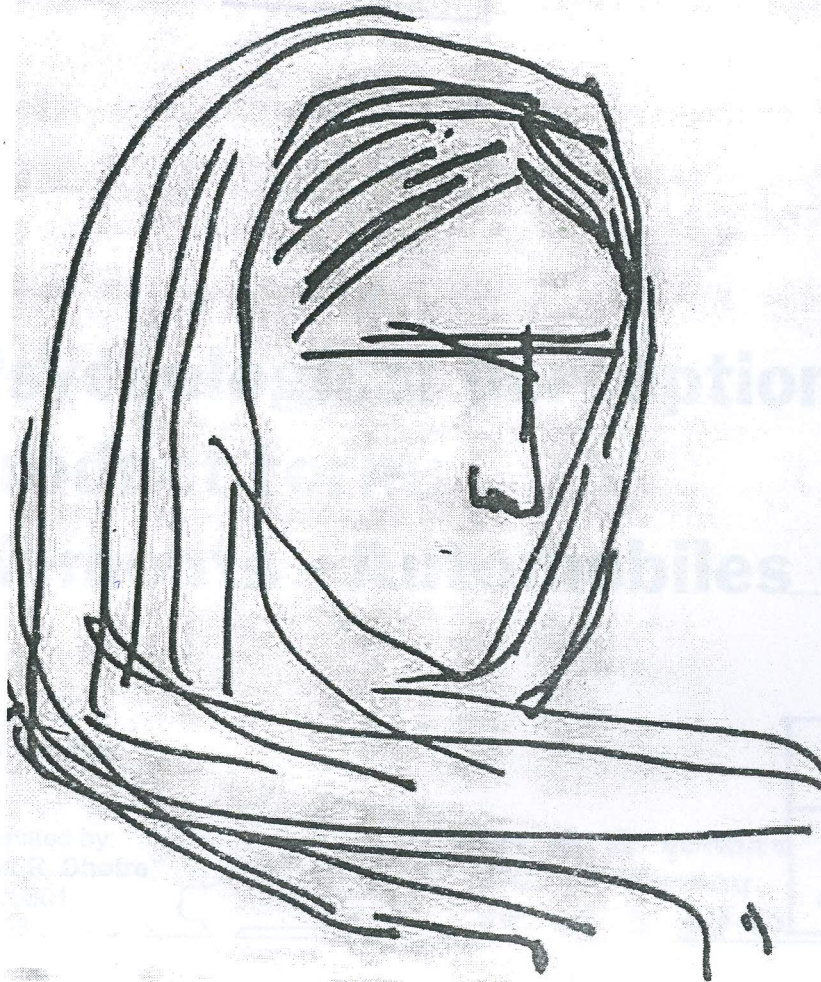
Imagery is a private and often a culture specific personal experience. The team efforts had some positive points, but could have worked in this case because the members had similar cultural backgrounds. As we saw earlier, sharing ideas sharing ideas to a certain extent requires sharing cultural stereotypes. Would the cross cultural team succeed? It is difficult to offer any conclusion on the issue.

The team members often do not report all the rich imagery experiences in the conversation. This not only prevented sharing of ideas but also deprived the partner from taking clues and developing new directions in thinking. The fantasy-based issues tend to remain completely unreported. Several reasons are possible. First, they may not be aware of the imagery as it is considered a natural experience. Second, perhaps, they may not consider the experience important enough to share or third even when the attempt is made, the words could have fallen short of capturing the richness of the images. Teamwork has to perhaps live with this major disadvantage. It would be too premature to come to the conclusion that the partners should narrate their imagery experiences. The images flow naturally with the thought process. It is not clear if the burden of description of imagery experiences on the speaker will slow down his natural flow of ideas and even hamper the development of the thought.

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Annexure 1

The lady as drawn by the Amol Palekar to explain the concept to Shilpa