

Practicing Art/Science

Experiments in an Emerging Field

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5 Probing the art/science binary

Notes on the experimental achievement of shared perception

Dirk vom Lehn

1 Introduction

Every working act is an experiment in miniature;
man is forever testing, accepting,
and revising his universe.

(Garfinkel 2006: 180)

The distinction between art and science has a long history. Today, perhaps the best-known author to have discussed the consequences of the ‘art/science binary’ (Jones & Galison 1998a) is C.P. Snow who, in his essay *Two Cultures* (2013), argues that the separation of science from the humanities is an obstacle to solving the world’s problems. However, more recent studies have challenged the ‘art/science binary’ (cf. Jones & Galison 1998b; Rheinberger, this volume) and show that art and science cannot be differentiated as clearly as Snow implied. The history of art, for example, illustrates that artists often experiment with techniques and technologies that have emerged in light of scientific developments. David Hockney’s (2001) investigation of Vermeer and other old masters’ use of lenses is an example of a scientific technology that artists have used to create innovative work and novel esthetic experiences for the viewer. In some instances an artist’s works are criticized by both art critics and ‘lay people,’ and the question ‘what is art?’ is often asked.

The nature of art has been questioned, challenged and investigated by philosophers, artists and scientists alike (cf. Goodman 1977; Luhmann 2000; Tolstoy 1996). R. Arnheim and E.H. Gombrich famously investigate the relationship between works of art and the mind. Arnheim (1974) argues that the mind and the world are similarly organized, and that, therefore, the phenomenal properties of works of art are self-evident. Gombrich’s (1982) view differs from Arnheim’s in that he suggests that we can conceive the work of artists as resulting from a series of experiments through which the viewer’s perception is gradually approximated with the artist’s perception of their work (Arnheim 1974; Gombrich 1960, 1982; Verstegen 2004). Both scholars’ work feeds into recent investigations in both cognitive science and

neuroscience, where research strives to discover ‘some sort of universal structure or “deep structure”, underlying all artistic experience’ (Ramachandran & Hirstein 1999: 17). These studies use standardized techniques and technologies, such as eye trackers and fMRI scanners, to find out what a generic or ‘model’ individual human being can see and how the ‘thing’ that the model viewer sees can be explained (Brieber et al. 2014; Ramachandran & Hirstein 1999). What results from the process through which scientists of perception reveal (or attempt to reveal) the ‘esthetic structures’ within research subjects’ brains is an ‘epistemic thing’ (Rheinberger 2006), which can then be further explored via subsequent research and more complex ‘experimental systems’ (ibid.).

In the view of neuroscientists of perception, people are equally predisposed to esthetics, and esthetic structures are ‘wired’ into the human brain. This neuroscientific approach to esthetics differs from the endeavors of artists who strive to instantiate esthetics within works of art through their creative activities. So do other lines of (scientific) research. The work of the art historian Gombrich (1960, 1982, 2002) addressed this gap between discussions in the sciences and the arts. In his research, he demonstrated that artists compare their work with what they meant to create and then use their perception of the piece to improve it. Thus, the creative process can be likened to an experiment through which the artist gradually approximates his work to the ideal in his mind. Therefore, esthetics is not only (or primarily) lodged in the human brain, but evolves through the creative process.

Research in the sciences as well as in art theory and art history makes important contributions to our understanding of the perception of art. However, due to its scientific orientation, this research only helps us explain what esthetics is from the perspective of scientists (neuroscience providing a recent example of such a perspective). Thus, this kind of research neglects the broader area of everyday esthetics and the ascription of an esthetic value to objects other than works of art, as well as in ordinary rather than experimental situations (Kupfer 1983; Light & Smith 2005; Ruggerone & Jenkins 2015). H. Garfinkel (2002) recommends, when one is interested in investigating a particular phenomenon, looking for a ‘perspicuous setting,’ where participants are dealing with just that phenomenon on a regular basis. For the purposes of this chapter, which is concerned with the practice of visual perception, I will turn to the work of optometrists, who, on a routine basis, inspect what and how clearly people can see, and to museum visitors who regularly encounter and examine visual objects, like paintings.

With regard to both settings, I am interested in exploring how participants display to each other that they see the world in the same way, i.e. that they have established an intersubjective perspective of the world. I will first turn to the practices deployed by optometrists to assess the ability of individual patients to see distance clearly. The analysis of a fragment of interaction between an optometrist and a patient recorded during a Distance Vision Test (DVT) investigates how the optometrist measures her patient’s ability to

see clearly in the distance. It serves, firstly, to reveal what intersubjectivity is in the situation of a DVT, and, secondly, as a basis for the analysis of intersubjectivity at exhibitions. Optometric consultations have been selected as a perspicuous setting because it is a domain that appears to be particularly suited to study how people assess what a co-participant sees, and because optometrists are members of a profession whose work is closely related to developments in the optical and vision sciences, a link that might allow us to compare scientific concepts of seeing as applied in professional practice to the practice of seeing in esthetic and cognate environments. Subsequently, I will examine interactions at three exhibits: the first is a 'funhouse mirror,' which shows an upside-down image of the onlooker in the reflection; the second is at an interactive arts-and-craft work; and the third, a painting by Rembrandt. However, and before I turn to the analysis of action and interaction in optometric consultations and in museums, I will briefly provide some further background to the chapter.

2 Intersubjectivity: from cognitive assumption to contingent achievement

Intersubjectivity is one of the key themes in Garfinkel's (1967) ethnomethodology. In his work related to intersubjectivity, he draws on Alfred Schütz (1967a, 1967b), who analyzed intersubjectivity in terms of what he called 'reciprocity of perspectives.' For Schütz, 'reciprocity of perspectives' is based on two idealizations: 1 the assumption that by exchanging standpoints participants can see the world in the same way as the co-participant, and 2 that all participants orient themselves to the particular situation in the same way. In a manuscript that remained unpublished until 2006, Garfinkel developed a 'sociological attitude' to conceptualize intersubjectivity as something which is interactionally and practically achieved, moment by moment. He conceives the achieving of intersubjectivity as an 'experiment in miniature' (Garfinkel 2006: 180), and argues that through interaction participants momentarily establish a sense of co-alignment, i.e. an intersubjective understanding, about the situation at hand, by virtue of producing 'working acts' that are sequentially intertwined with each other. In this sense, each working act tests the hypothesis or expectation about the co-participants' orientation to the situation; and, in turn, the co-participants' response, their 'working act,' provides a way for them to display their alignment with their participant's orientation, and, at the same time, tests the participant's orientation to the situation, and so forth. Thus, the participants achieve intersubjectivity moment by moment, without a shared world being maintained, because with each action the situation is transformed.

In this view, intersubjectivity is not stable and sustained for the duration of a situation as might be implied by Thomas's (1967) 'definition of the situation.' In museums, people often stand side by side and look at an exhibit. Following Thomas and also Schütz, we could argue that in such

situations people assume that they all see the exhibit in the same way. This argument, however, would obscure the actions underlying such assumptions about co-participants' orientation towards the exhibit and situation at hand. In turn, the aim of this chapter is to lift the veil that obscures the practical constitution of their 'moments of intersubjectivity' by examining, in detail, fragments of interactions in optometric consultations and at exhibits in museums. As we shall see, these are moments when the participants display they have constituted a visual object that they both orient themselves towards in an appropriate way, according to the situation. More specifically, I will examine video-recorded fragments of interactions to explore: 1 how visual co-orientation is achieved in the ordinary circumstances of optometric consultations and museum visits; 2 how the observations made in these two settings may inform our understanding of the differences in the interactional production of an intersubjective perceptual experience in two institutional settings; and 3 how these differences may influence our understanding of the relationship between art and science. Accordingly, the chapter will address a practical problem that participants routinely encounter and deal with in everyday interaction: How can we be sure what co-participants are seeing? Are they seeing what we are looking at in the same way we are seeing it? In turn, these questions invite us to take a closer look at their experimental achievement of shared perception.

3 Achieving optometric intersubjectivity

People occasionally face situations where their ability to accomplish an activity is assessed; for example, people might be subjected to tests of their knowledge and skills. These tests are often undertaken in designated locations where participants are removed from usual day-to-day activities and placed within a test situation, despite the fact that the ability that is being tested is mundanely carried out in everyday situations where people act and interact with others. Driving tests, as well as tests of pupils' mathematical knowledge and skills, are examples of such forms of assessment. Another situation in which a participant's ability to accomplish an activity is tested is the DVT, usually conducted as part of an optometric consultation, which assesses the ability of a participant to see clearly in the distance. In this part of the chapter, I will examine the situation in which the DVT is undertaken in optometric consultations.

On arrival at an optometric practice, people register their attendance with a receptionist and wait with others in the reception area or waiting room to be called into a consultation room. The consultation room is of relatively small proportions, often not larger than 6 meters by 6 meters. At one end of the room hangs a wall chart, or alternatively a mirror onto which charts and other objects are projected during the course of the consultation. At the other end of the room stands a consultation chair. The chair is a large and heavy piece of equipment, which stands firmly in position. With a person

sitting in it, the chair can be moved, hydraulically, up and down, to adjust its elevation with regard to the participant's height in line with the location of the chart or mirror on the opposite wall (see Figure 5.1)..

When the patient is called into the consultation room, she is greeted by the optometrist. While the patient removes overcoat or jacket and is asked to sit in the chair, the optometrist closes the door and then sits on a swivel chair near a desktop computer. The encounter of the two participants begins with a greeting and an informal conversation about current events or the weather. Soon after, the client sits in the consultation chair and the optometrist changes the topic of the conversation to what will become and remain the topic of conversation between the two people for the duration of their meeting in the consultation room. This topic change is introduced by questions like 'how have your eyes been?,' 'have you noticed any problems with your eyes?,' or 'any changes in your vision since your last visit?' These questions give patients the opportunity to align themselves with the optometrist and to answer questions about their eyes and vision. From here on, an interview-like conversation follows that is often described as 'history taking' and leads to notes being made in a 'record form.'

Once the door has been closed, the situation in the consultation room is removed from the public or semi-public domain and turned into a private meeting between two participants who then engage in activities that center around the state of the patient's eyes and vision. Through their actions, the two participants generate an institutional arrangement that is understood as an optometric consultation. For the duration of the subsequent activities, and by virtue of their actions, the two participants adopt and make visible the roles of optometrist and patient. During the 'history-taking' process the optometrist asks questions and records the patient's answers in a record

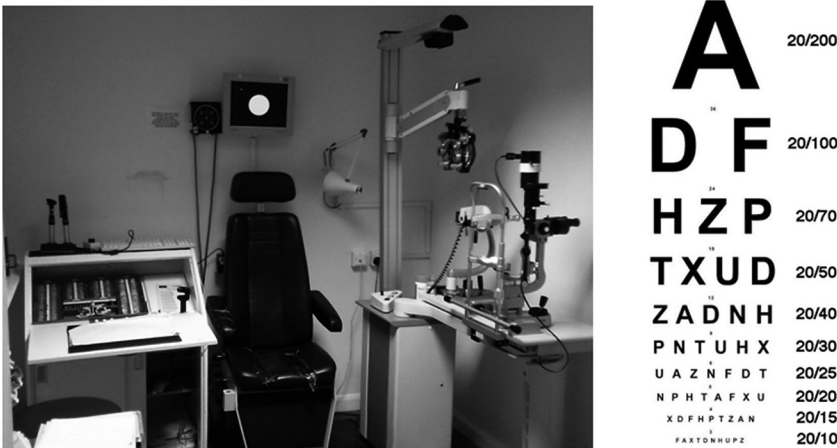


Figure 5.1 Optometric consultation room and standard vision chart

form that is stored in the optometrist's files. The information recorded in the form, including measurements of existing lenses used by the patient, is relevant for later stages in the consultation and is also drawn on should the patient return to the same optometric practice at a later date. From here on, the focus of activities is on what and how clearly the patient can see, and, subsequently, also on the health of ~~their~~ eyes. One of the first activities following history taking is the DVT, which I will now describe as it illustrates a particular practice that is conventionally deployed by optometrists.

4 Preparing the DVT

The DVT requires the patient to sit in the consultation room and read out letters from a standardized chart that is positioned at a given distance directly in front of them. Textbooks in optometry, like Elliott's (2003: 31–32) *Clinical Procedures in Primary Eye Care*, provide instructions for the procedure of the DVT from the optometrist's perspective. They instruct the optometrist to configure the situation for the test by carefully considering the layout of the room and the lighting conditions. Before beginning the DVT with, if known, the patient's 'weaker' eye, ~~they are~~ told to inform the patient about the nature of the test by telling ~~them~~ something like 'now we shall find out what you can see in the distance' (Elliott 2003: 31). Subsequently, one of the patient's eyes is covered up and the test commences. The following fragment begins after the optometrist and patient have had a brief general conversation before the optometrist moves the conversation to the business of the DVT by saying 'shall we see what you can see' (Transcript 1a, line 1). As she moves to begin the test it transpires that the patient is blind in the left eye.

The preface to the beginning of the DVT is designed to ensure that the test is undertaken under experimental conditions. The optometrist tries to ascertain that the patient will participate in the test with only one eye initially. The patient insists that it is not necessary to occlude the left eye because he is unable to see anything with it. The optometrist makes two attempts to cover the eye with a patch but the patient repudiates. She then moves on and begins the test of the right eye without physically covering the left eye (lines 12–14).

The DVT procedure begins when the optometrist encourages the client to read out the first line of letters by saying 'you want to try that for me' (line 15). After the patient has read the first line, the optometrist produces an acknowledgment token, 'good,' which encourages the patient to keep reading out the next line of letters (line 16–23). The patient pronounces each letter clearly and leaves brief, noticeable pauses of equal length between each letter, generating a rhythmic pattern as he reads out loud. After each line of letters, the patient pauses, occasioning the optometrist to acknowledge his reading either with a vocal token, 'good' (lines 18, 20) or by briefly nodding. The acknowledgments used in these cases relate to the patient's reading, but are not an assessment of it (vom Lehn et al. 2013).

1 O: okay: shall we see what you can see (.) he [he he he he
 2 C: [yes all I can
 3 see: he he he[he he he he
 4 O: [thats what you are here for
 5 ...hh lets bring thee (.) the letters up on the chart s::o:
 6 eh:m
 7 (1.3)
 8 so all I want you to do: is start at the top of the char:t
 9 and rea:d down as many a[s you can
 10C: [yah it it its not necessary
 11O: it really if I just cover that one up you dont se[e anything at
 12C: [I dont see
 13 any[thing at a:ll (.) yes
 14O: [at all?
 15 you want to try that for me
 16C: Pee eitchH yoU Zed eNn (.)
 17 eNn Vee ahR Dee
 18O: good
 19C: Ee ahR eFf Pee eitchH
 20O: good
 21C: eFf Vee eitchH yoU ahR (.)
 22 yoU: Ve:e Ze:e Zed eFf

Figure 5.2 Transcript 1a

With each line read out by the patient and acknowledged by the optometrist, the participants display to each other that they are oriented towards the situation in the same way. When the patient begins to read out the first line of letters, the optometrist briefly nods and the patient immediately continues with the next line of letters, 'eNn Vee ahR Dee' (line 17). The optometrist acknowledges the reading of this line by voicing a brief but firm 'good' (line 18), further encouraging the patient to read from the chart. While the reading continues the two participants look in opposite directions, the patient at the chart and the optometrist at the patient. Although visually the two participants do not focus on the same object, they have established an intersubjective orientation to the situation, i.e. to the process of undertaking the DVT. Due to the fact that the institutional status of the two participants differs in this situation, the intersubjectivity achieved in this moment serves a particular pragmatic purpose, namely conducting the DVT. Hence, the patient treats the acknowledgments produced by the optometrist as encouragement to continue reading.

The sequence of actions made up of reading out letters and producing vocal or physical gestures of acknowledgment can be interpreted as a sequence of 'experiments in miniature' (Garfinkel 2006). With her initial request for the patient to read from the chart and then with each acknowledgment token, the optometrist tests if the patient is (still) oriented towards the DVT. And with each reading out of a line of letters, the patient displays his sustained participation in the DVT. The patient's continued participation in the DVT is further shown through the rhythm generation by his reading pattern, which implies continued activity. Only when the patient beings to

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show difficulties in his ability to see the chart clearly, which can be identified by changes in the rhythm of how he reads out the letters, does the optometrist's participation status in the test change. She visibly and audibly attends to the client and then turns to the next phase of the test.

5 Testing distance vision

As the lines get smaller in size from top to bottom on the chart, the patient arrives at a line that he cannot see as clearly as previous lines. At this point, he changes rhythm in how he reads out the letters. In our fragment, the optometrist changes the token from a firm 'good' to a quickly voiced '>good<' (Transcript 1b, line 23); in other cases, the token is changed from a firm 'yeah' or 'good' to an 'mhm' in response to the client's hesitation and repairing of the voicing of letters.

In this fragment, the optometrist's acknowledgment is followed by the patient admitting that he would have difficulties reading out the last two lines on the chart (line 24). Yet, it is precisely this moment, when the patient has difficulties seeing letters on the chart, that is of interest for the optometrist. She now moves to the test phase in which she encourages the patient to 'guess the second line from the bottom' (line 25–26). This phase of the DVT, which involves the use of professional and standardized techniques and technologies, tends to be relatively short, no more than three or four turns of speech. It is brought to a close by the optometrist, who does not encourage the patient to continue reading out letters; rather he or she would generally switch the occluder to the other eye, or move on to a different test.

In fragment 1, the optometrist encourages the patient to try to read out the next line of letters. The client, in turn, vocalizes the line of letters, 'Dee Vee al yoU eNn' (line 27), which the optometrist responds to by producing an acknowledgment and assessment. She says, 'yah that's lovely (.)', and then provides the patient with a test score, '20/20,' which (line 29–30) equals the visual acuity score of an 'average' or 'normal' patient.¹ In other fragments, we have seen that for the professional purpose of the optometrist's work the mere proclamation, 'I can read them all,' is not sufficient information so as

```

23 O: >good<
24 C: (last two are)
25 O: =just a bit shaky could you guess the second line from the
26 bottom do you think? (.3)
27 C: yah eh: (.3) Dee Vee aI yoU eNn
28 O: yah thats lovely (.)
29 have you heard the phrase twenty twenty vision?
30 C: yes I have
31 O: that right eye is twenty twenty (.) ve[ry nice hehe
32 C: [hehehehehehe
```

Figure 5.3 Transcript 1b

to assess the patient's clarity of vision. In order to be able to determine a patient's visual acuity, the optometrist monitors how ~~they read~~ out the letters, and, in particular, assesses the way in which the letters are read out. Having identified which line of letters the patient is unable to read, the optometrist has gathered sufficient information to determine the visual acuity score. Based on the organization of the chart, and the patient's reading of the previous line, he or she can read the score on the chart and subtract the number of letters the patient was unable to read; e.g. a patient who was able to read three letters out of five on the line indexed 20/20 will receive a score of 20/20–2.

The test phase of the DVT can be likened to a scientific experiment that subjects an individual to standardized, professional procedures in order to discover ~~their~~ visual acuity. The visual acuity score allows the optometrist to compare the patient's clarity of vision in the distance with that of a 'normal' patient who is able to see clearly at a distance of 20 feet (6 meters). The score of '20/20' achieved by the patient in fragment 1, therefore, indicates that this patient has the same level of visual acuity as a 'normal' patient. In theory, this patient could exchange geographic standpoints with the 'normal' patient and see the lines of letters in the same way as ~~they do; for a patient who achieves a visual acuity score of '20/50' to achieve optometric intersubjectivity, the 'normal' patient would have to move 50 feet away from the chart.~~ Optometric intersubjectivity is a theoretical concept – not addressed as such in the professional literature – which describes a concrete patient's visual acuity in comparison to that of a 'normal' or 'average' patient who can see the letters on the chart clearly at a given distance. It captures the pragmatic purpose of the DVT, i.e. to discover a patient's visual acuity as an 'epistemic thing' (Rheinberger 1992). The process of discovery of the epistemic thing involves vocal and visual actions that are methodically produced by the optometrist and patient following professional standards and regulations. For the process to be accomplished in the required way, the situation is controlled, for example, by shutting the door to the room and having the patient sit in the consultation chair, and by disciplining the patient's actions – in particular, what ~~they look at and see.~~

6 Achieving imagined intersubjectivity in museums

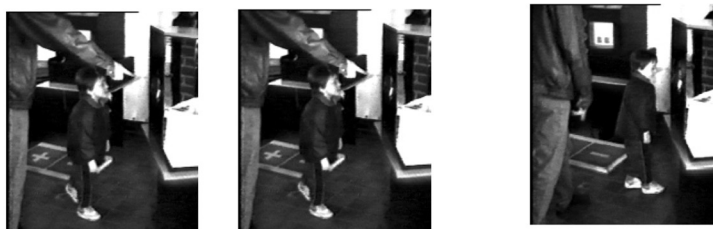
In science, experiments are sources for the 'systematic production of novelty' (Pickstone 2000: 13) and can be used for the demonstration of phenomena. Hence, in the 18th and 19th centuries, museums were organized into separate sections so as to provide scientists with a space where they could publicly conduct experiments; not to make discoveries, but rather to demonstrate the phenomena they had discovered to the public (Shapin & Schaffer 2011). The physical act of moving experiments from the privacy of scientific laboratories to public exhibition spaces suggests a change in attitude towards scientific phenomena and, more generally, cultural

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phenomena. This change is reflected in the emergence of the science center, since the 1960s, which has led to the opening of a large number of science centers worldwide (cf. Hein 1991). The contemporary display of interactive exhibits in science centers, and now also science museums, encourages non-scientists to conduct experiments in museums. One, perhaps, unintended consequence of this development has been that people not only perform experiments to discover phenomena for themselves, but also, once they have discovered a phenomenon, they instruct their companions so that they can personally reproduce the experiment and discover the same phenomenon.

Let us turn to one such experiment at an exhibit by considering fragment 2 where a father and son interact at a ‘funhouse’ mirror. Funhouse mirrors show a reflection of the onlooker that distorts their face or body. Katz (1996) produced a fascinating study that shows that people’s response to the exhibit arises from the interaction between them, and that for this experience to take place it is necessary that participants stand in a certain position and look into the mirror in a particular way, as otherwise, the phenomenon does not occur. To explore this point further, let us turn to fragment 2, recorded at one such mirror, a small concave mirror built into a wooden cube displayed in Green’s Mill Science Centre in Nottingham, UK. People who look into the mirror see an upside-down reflection of themselves.

In fragment 2, a father and his son create a situation in which one of them looks at and visibly and audibly responds to the reflection in the mirror. The fragment begins when the father has discovered the concave mirror and then encourages the boy to have a look at the object by vocally and gesturally referring to it. He instructs the boy to turn to the mirror by saying ‘look’ and ‘look at this’ (Transcript 2a, line 3) and by pointing in the direction of the object. The boy stops and looks into the mirror, but then withdraws from the exhibit without replying in such a way that the father was able to acknowledge it as being in response to the mirror.



3 F: look at this

4 (1.6)

5 its upside down come on

Figure 5.4 Transcript 2a

As the boy leaves the exhibit, the father turns to him and says, ‘it’s upside down, come on’ (Transcript 2a, line 5) and then takes him by the shoulder and gently leads him to stand in front of the mirror (Transcript 2b). When James arrives in front of the mirror, the father reformulates his original utterance, ‘you’re upside down James’ (line 6). A moment later the boy looks into the mirror and bursts out laughing (line 7). The laughter appears to be occasioned by the boy’s discovery of the reflection in the mirror. Yet, it is also produced as a response to the father’s encouragement to ‘>look<’ and to see himself ‘upside down’ (line 6). The son’s laughter, which begins just before the father completes his utterance, brings the interaction at the mirror to a close. The boy’s parents both stand up straight and turn to leave the exhibit together with him.

The situation at the mirror has similarities to the experiment discussed with regard to the situation in an optometric consultation (fragment 1). It principally involves two participants who interact largely undisturbed from others around a visual object. The father’s actions configure the boy’s bodily and visual orientation in such a way that he can see and respond to the mirror. The boy’s first response to the mirror is subdued, so much so that the father cannot be sure if his son has actually ‘seen’ the visual object. By virtue of enhancing his initial actions, and thus physically guiding the boy to a stand and viewpoint at the exhibit, the father configures his son’s encounter with the mirror. The encounter can be described using Garfinkel’s analogy as an experiment designed to discover if a co-participant is able to discover his or her reflection in the mirror. For the experiment to succeed the father first prepares the arrangement of the situation in front of the mirror by manipulating the boy’s body and visual orientation in front of the object, and then provides him with information about what there is to see in the mirror, i.e. ‘it’s upside down.’ As the father has no direct access to the boy’s visual perception, he relies on some kind of report or other response that reflects what the boy sees. In Transcript 2b, this response is duly delivered by the boy, who produces loud and prolonged laughter. In the situation at the concave mirror, this laughter is equivalent to the reading out of letters from the optometric chart. The laughter renders observable the fact that the



6 F: >Look< youre upside down Ja[m]es
 7 J: [hahahaha]

Figure 5.5 Transcript 2b

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boy, having adopted the correct stand and viewpoint at the mirror, sees a visual object and responds to it as expected by his father who, when the laughter becomes audible, stands up straight and, like his son, begins to move away from the exhibit. Therefore, with the laughter, the two participants have achieved intersubjectivity at the mirror.

Save for the relationship between the participants at the exhibit-face, through his actions, the boy also achieves a relationship with the designer of the exhibit. It is highly likely that the boy may be what the designer of the exhibit conceived of as being the 'imagined audience,' a concept that Litt (2012: 330) developed with regard to communication on social media. When exhibitions are developed and staged, those involved in the design process imagine the audience of their creations and what their experience at the exhibit will be (cf. Bitgood 2014; Caulton 1998; Hall 1987). After the opening of an exhibition, people largely explore the exhibits independently and in ways which, at times, had not been anticipated by the designers. They approach, examine and make sense of the exhibits on their own terms. In the case of the mirror cube, it can safely be assumed that it was the intention of the designer to have visitors look into the mirror and respond to their upside-down image. If we agree on this assumption about the designer's intention then we can argue that through his actions at the mirror, the boy has achieved 'imagined intersubjectivity' with the designer. At the same time, however, it is worth mentioning that while the designer may have imagined visitors being amused by their reflection in the mirror, they have probably not anticipated the concrete ways in which visitors come to look into the mirror.

To further explore how people experience exhibits, I will turn to fragment 3, recorded at an exhibit created in cooperation between the artist-designer Jason Cleverly and members of the Work, Interaction & Technology Research Centre. The purpose of *Deus Oculi*, as the interactive exhibit was titled, was designed to encourage people to become involved in experiments to create phenomena in interaction with others (Heath et al. 2002). The emphasis of the design of this and other exhibits was to generate opportunities for cooperation and concerted discovery of visual phenomena that appeared on two built-in CCTV monitors.

Jason Cleverly's *Deus Oculi* comprises three parts: a painting, and two hand-held mirrors on either side of the painting. The painting shows a landscape and two faces that have been drawn on two small doors. Behind each door is a CCTV monitor connected by a wire to CCTV cameras built into two mirrors that hang on the wall on either side of the painting (see Figure 5.6)..

People who encounter the piece often first look at its various parts before they discover the relationship between the mirrors and the monitors; when they stand in front of the handheld mirror with the built-in camera, their face appears on the monitor. On discovering this relationship between the handheld mirrors and the monitors in the painting, people often take action



Figure 5.6 *Deus Oculi* by Jason Cleverly

so as to render this fact discoverable to their companions. Rather than explaining the relationship to their companion, visitors often perform actions that allow their companions to discover it for themselves. Fragment 3 shows three visitors interacting at the exhibit: Julie, in the middle, explains to Mary, holding the mirror, what to do, and Anne stands in front of the painting opening the door on the right-hand side (see Transcript 3a).

The fragment begins with Julie instructing Mary, who has just gone to the mirror on the wall to the left of the painting, to ‘take it off the wall’ (Transcript 3a, line 1). From here on, Julie, and later also Anne, configure the arrangement of the experiment. Through their subsequent actions, they encourage Mary to move her body to a certain place in front of the piece and when she has done so, to look at the same time into the mirror and at the CCTV monitor in the painting.

As Mary holds the mirror and turns around Julie says, ‘come around here.’ The utterance, coupled with a pointing gesture, encourages Mary to slowly change her position and look at the painting (line 3). The way in which Mary moves forward suggests that she hesitates, perhaps because she is not yet quite sure what to do and what to expect from the exhibit. Her hesitation engenders further action from her two friends. Julie reformulates, and thus enhances, her initial instruction, ‘look in here and go up close’ (lines 3–4), while still pointing at the painting. Anne, who stands to the right of Julie and Mary, in front of the painting, has opened the little door that covered the screen behind, raises her arm and points at the monitor just

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1 J: take it off the wall
2 (.3)
3   come around he:re (.) and look in here
4   and go up close and try and get your face (.) in that picture
5 A: you've got [to look in there
6 J:           [look there
7 M: oh I don't look in he:re
  
```

Figure 5.7 Transcript 3a

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when Julie says, 'here.' Julie continues to voice instructions and gestures in front of Mary who progressively walks to a position nearer the monitor. Anne also points at the painting suggesting to Mary where to look, saying, 'you've got to look in there' (line 5), overlapping this statement with Julie, who looks at the mirror in her hand saying 'look there' (line 6). Mary responds to these actions by displaying an understanding of the instruction to 'look in there' by saying 'I do look in here.'

The actions up to this moment prepare the experiment through which Anne and Julie test Mary's ability to see the visual phenomenon in the monitor. They provide Mary with information about how to manipulate her face in relation to the handheld mirror in order to have an image of herself appear on the monitor. When Anne looks up at the painting she sees this image of her friend and says, 'there you are now' (Transcript 3b, line 8). A moment later, Mary produces an utterance, 'oh my goodness me' (line 9), followed by an assessment of the image (line 11), which is accompanied by Anne's loud laughter (line 10). While Mary joins in with her friend's laughter, she returns the mirror to its fixture on the wall.

The analysis above suggests that the participants arranged the objects at their disposal to generate an experiment that provides for a co-participant's response to a visual phenomenon, which only appears when they positioned their bodies and visual orientation in a particular way in relation to the handheld mirror and the CCTV monitor embedded within the painting. At *Deus Oculi*, the standpoint of the viewer is not as clearly defined as in the case of the concave mirror or the optometric chart. Cleverly, the designer of the piece fostered a situation in which the notion of standpoint varies with the location of the handheld mirror and the position of the person holding it, as well as with the actions of other people at the venue. In the case in hand, Mary held the mirror and looked into it while her companions instructed her visual conduct and encouraged her to look at the CCTV monitor in the painting and hold the mirror in a particular way in front of her face. It is only when Anne pointed out 'there you are now' (line 8) that Mary displayed she had discovered the visual object, i.e. her mirror image, by looking at the monitor saying 'oh my goodness me' and by subsequently returning the mirror to the wall (Transcript 3b, line 9).

Through the organization of their actions, the three participants achieve an intersubjective experience of *Deus Oculi*. Julie and Anne, who had discovered the visual object prior to their friend, instructed Mary's visual action by telling her where and how to look until she demonstrated that she had discovered the phenomenon. Her utterance, 'oh my goodness me' (line 9), coupled with her returning of the handheld mirror to the wall, not only brought the interaction at the exhibit to a close, but also instantiated the achievement of an intersubjective experience. The interaction between the participants brought about an intersubjective experience of *Deus Oculi*. It also involves the accomplishment of an 'imagined intersubjectivity' between the viewer(s) and the artist-designer who, in this case, on occasion was

5 A: you've got [to look in there



Image 3.1.

6 J: [look there

7 M: oh I do look in here



Image 3.2.

8 A: =there you are now



Image 3.3.

9 J: oh my good[ness me

10 A: [ha ha ha [ha ha ha

11 J: [oh I'd rather not hehehehehehe



Image 3.4.

12 J: hehehehe



Image 3.5.

Figure 5.8 Transcript 3b

present and instructed or even demonstrated to participants how to manipulate the mirror so as to generate an image on the monitor. The imagined intersubjectivity is accomplished by virtue of an experiment that requires a disciplining of the participants' actions to configure stand and viewpoints at the exhibit, as well as the 'action point' (Hindmarsh et al. 2005) where the handheld mirror is manipulated to make the phenomenon appear in the monitor.

The creation of perspective in an exhibit involves an intertwining of bodily and visual action with material objects. In case of *Deus Oculi*, one of the material objects, the handheld mirror, is manipulated and moved by the viewer in order to generate the visual object. Therefore, in the case of this exhibit, the perspective of the viewer is not fixed but contingently changes in line with the actions and interaction of participants in front of the painting with the inbuilt monitors. The disciplining of the actions of those taking part is achieved in a more subtle way because the length of the wires connecting the cameras in the handheld mirrors to the monitors allows them to move with little constraint in front of the painting. Critical for the disciplining of participants' actions is not only the design of the elements of the material objects, but also the actions of co-participants, companions, other people, or the artist, who occasionally instructs the appropriate actions required in relation to the piece.

7 Ephemeral intersubjectivity

When looking at paintings in museums people are not subject to a test but they generally pause to consider and appreciate the works of art. As they move in front of a painting, they stand still and look at the piece. Research on art perception uses eye tracking systems to investigate what the viewer of a work of art sees, and how the viewer's seeing relates to theories about art perception (Brieber et al. 2014). Their analysis results in scientific descriptions of the perspective that a 'normal viewer' adopts before a particular work of art. Although these experiments have recently moved from the lab into the museum (Bachta et al. 2012; Eghbal-Azar & Widlok 2012), this research still maintains the organization of controlled scientific experiments. To ensure the purity of the data, this kind of research systematically excludes from the study other people who are in the museum at the time of the experiment.

Whilst for the practical purposes of scientific experiments the exclusion of other people and their actions might be useful, the experimental situation arranged either in the lab or in a museum does not reflect the situation in which people in ordinary circumstances look at and experience works of art in a museum. In fact, historic studies demonstrate that the modern museum was conceived as a public place where people could socially organize their action and interaction with each other. Some scholars argue that the 'social order' in a museum is facilitated by the continual observability of people at

the exhibition. Trondsen (1976), Hudson (1975) and Bennett (1995), for example, suggest that museums have been designed to allow for situations to arise where people can continually observe others, and continually feel that they might be under observation by others, and therefore conduct themselves in appropriate ways.

Observations in art galleries and museums suggest that people often examine paintings while standing side by side, in front of and looking at the works. As the participants look at a painting they remain quiet, and their examination of the work appears to occur more or less independently from others present. At times, they draw selected features of the exhibit to the attention of their companions by initiating conversation and by gesturing to the painting. The following analysis of fragment 4 will focus on two participants who independently examine a painting by Rembrandt, turn to inspect the piece together and achieve an intersubjective experience of the work (see Transcript 4).

The fragment begins when Anne, in the foreground, and Megan, to her right, stand and look at Rembrandt's portrait of Hendrickje Stoffels. Anne has arrived and stopped at this painting first before her companion comes to a stop to her right. By virtue of her bodily position and visual orientation, Anne displays what she is looking at, i.e. the painting. At the same time, her position in front of the painting predetermines the area where her companion will stand. Megan can choose to stand elsewhere or walk past Anne, but as in many other cases in my body of data (vom Lehn 2012, 2013), she chooses



1 A: is she on a chair? what's the red thing?



2 M: (eh probably a bed ehm a bed
 3 A: yah cause she's
 4 M: sitting
 5 A: (leaning on it)
 ...

Figure 5.9 Transcript 4 – Anne and Megan at Hendrickje Stoffels

to stop near her companion. From this position, she can read the label and look at the painting while being near her friend. After a few seconds, Anne says, 'Is she on a chair? What's the red thing?' (Transcript 4, line 1). By virtue of her utterance, she references an object depicted in the painting, and thus provides Megan with information about what she is looking at and seeing; it is 'the red thing' that she is currently examining. As she finishes her utterance, Anne tilts her head to her right displaying that she was addressing her friend and encourages her to respond. The utterance and the tilt of the head encourage Megan to turn from reading the label to look at the painting. In this brief sequence of actions, Anne encourages her friend to adopt a stand and viewpoint with regards to Rembrandt's painting; Megan now stands to Anne's right and looks at the painting.

In this opening part of the interaction in front of Rembrandt's painting, Anne and Megan prepare for a concerted examination of the piece. By adopting a particular standpoint and looking at the painting, Anne displays what aspect of the painting she is looking at. Anne's bodily and visual action encourages Megan to bring her movement through the room to a stop, and to come and stand to Anne's right and look at the same painting. A moment later, the two participants *seamlessly* continue their interaction in front of the exhibit by beginning to talk about a particular feature. When Anne asks for the meaning of 'the red thing,' Megan responds by saying, 'eh probably a bed' (line 2). Thus, the two participants establish a 'talkable' item, i.e. an object in the painting that they then use to continue their examination of the painting and their interaction. They have achieved intersubjectivity as they display to each other that, in this moment, they are looking at and seeing the same object. The interaction at the exhibit does not stop with the constitution of an object and the achieving of intersubjectivity; rather, Megan and Anne continue their discussion of this particular feature of the exhibit by describing the composition of the painting. They show a particular interest in the relationship between the 'bed' and the figure, named in the label as Hendrickje Stoffels, and suggest that she is 'sitting' (line 4) and 'leaning on it' (line 5).

From the analysis above, we can see that the intersubjectivity that the participants achieve in interaction with each other is fragile, as new aspects of the painting continuously attract their attention and interest. Having achieved a momentarily shared experience of 'the red thing,' the two participants continue their interaction before the piece by examining further features of the painting, such as the relationship between different features within Rembrandt's work. With each shift in visual orientation and in conversational topic, the achieved intersubjectivity is called into question. The intersubjectivity that is achieved in these moments has an ephemeral quality because it disappears again as soon as the next action is introduced. Through the next action, and the response, such as adjustments in bodily and visual orientation, the participants reaffirm that they are still examining the work of art in concert with each other. Thus, we begin to see that what people look at and see, despite being contingent on the situation, does not arise

accidentally. Garfinkel's (2006) notion of an experiment in miniature provides us with an interesting way to characterize the organization of the participants' concerted inspection of an exhibit. It suggests that interaction progresses as people continually produce actions that test whether or not co-participants are in alignment with them. With regard to the interaction at the painting, we can further argue that the participants systematically embed exhibit features within the sequential organization of their vocal and visual actions, and thus systematically examine one exhibit feature after the other as their interaction progresses.

Save for the ephemeral intersubjectivity that the participants achieve in interaction with each other, they also produce an imagined intersubjectivity through which the concrete viewer of the work of art becomes connected with the viewer imagined by the artist when he produced the piece. Art historians and art theorists, as well as researchers, who would like to uncover the relationship between the artist's mind and the viewer's perspective, have carried out research to try to reveal this connection. Yet, the analysis of fragment 4 suggests that with regard to art perception in museums, the concept of the 'normal viewer' is only of theoretical significance because visits to museums are generally social occasions and people encounter and experience works of art in social situations (cf. Jafari et al. 2014).

8 Discussion

My interest in analyzing the data gathered in two very different settings, optometric practices, and museums, arose from a concern with the 'art/science binary' (Jones & Galison 1998a, 1998b). As the analysis of the interaction in optometric consultations and science centers has shown, experiments are not limited to the sciences, but some of their principles can also be observed in everyday life. We have seen that optometrists replicate, as far as practically possible and professionally necessary, the conditions of scientific experiments; and thus, the optometric profession tries to ensure that test results are comparable over time and across patients. Therefore, they are, in a certain way, 'objective' and 'generalizable,' just like 'scientific' findings. As part of the DVT, the optometrist excludes third parties, and disciplines and monitors the patient's bodily and visual action in order to ascertain the 'objectivity' of the outcome of the test. This is done first by using pieces of technology, like the consultation chair and the standard letter chart, to manage the patient's bodily action, and by using the occluder and speech to fashion the patient's visual action. The results from the DVT are 'fixed' in a patient record form, and they can be compared across patients and shared with governmental health institutions or other databases.

The interaction at the mirror cube has properties that are reminiscent of scientific experiments. At the mirror cube, the father's hands, which guide and hold the boy's body in position until an appropriate response is produced, can be seen as equivalent to the optometric consultation chair and

the actions the optometrist conducts to manage a patient's behavior. The properties of the exhibit are used to experiment with an individual's reflection in the mirror and to test if other people can see the reflection as well. By virtue of their actions in front of the mirror, those interacting with it display they are engaged in an activity with the piece, and other people tend to respect their engagement with the object and do not walk through the space between them and the mirror (cf. Goffman 1971). Thus, the experiment at the mirror takes place largely without interference by third parties and leads to an outcome that is similar to other people's response to the reflection in the mirror.

The interaction with and around *Deus Oculi* is more difficult to liken to an experiment and the events in the optometric consultation room because participation with the interactive artwork is less constrained or disciplined by the design of the piece and/or by the parties involved. Moreover, third parties might walk into the space at any point and influence the events at the exhibit. The outcome of people's interaction has been similar across my body of data; through their vocal and bodily behavior, people display amusement at the images that appear on the monitors built into the painting (Heath et al. 2002). Neither in case of the mirror cube nor at *Deus Oculi* is the outcome of the interaction later fixed or recorded, or used more broadly for comparative purposes. In contrast to the test score written in the patient-record form, the laughter at both of the two exhibits has no further relevance or implication. In all three cases, the optometric consultation, the mirror cube, and *Deus Oculi*, the interaction engenders a response from a co-participant who displays that their visual perception is in alignment with the participant's expectation. They achieve intersubjectivity with their companion(s) in and through the progressive alignment of their actions. Moreover, they achieve optometric intersubjectivity with a 'normal' patient, in the case of the DVT, and imagined intersubjectivity with a participant that was theoretically constructed by the artist or designer, in the cases of the artwork and exhibit, respectively.

Turning now to the interaction at Rembrandt's painting, we can see how what participants look at and how they see it emerges contingently in the situation at the exhibit. Although in the analysis I have differentiated a preparatory phase in which the two visitors adopt standpoints at the piece and a phase in which they achieve intersubjectivity, the participants themselves do not make such a distinction. For them, the interaction is a seamless, ongoing series of events during which they orient themselves towards and make sense of different exhibit features in concert with others. Although the sociology of museums suggests that people's actions are shaped by institutional and social controls (Bennett 1995; Trondsen 1976), it transpires that action and interaction at the exhibit-face emerge within the constraints of a continually renewed and reshaped 'ecology of participation' (Heath et al. 2002).

Works of art offer myriad opportunities for examination and response from viewers (cf. Luhmann 2000). Scholars concerned with the (neuro-)scientific

study of the perception of art (Brieber et al. 2014; Ramachandran & Hirstein 1999) use technical methods to identify viewing patterns. In so doing, they largely focus on individual viewers and exclude possible external influences, which commonly occur in museums, from their analysis. Naturalistic situations like the one recorded at the Rembrandt painting differ from scientifically arranged experiments designed to generate a 'normal viewer' and the discovery of an average viewing pattern of a painting. Despite the contingency of such situations, people's visual perception and experience of works of art do not occur by accident; rather they are systematically produced in, and through, the organization of actions. In the analysis above, I have drawn on Garfinkel's (2006) analogy of an 'experiment in miniature' to characterize the organization of action at the painting, while, at the same time, I stayed close to the language used to describe scientific experiments. The analysis reveals that participants achieve intersubjectivity in front of a painting by interweaving their sequentially organized actions with the features of the painting they are observing. Those exhibit features then become topics of speech between the participants, and shifts in these topics are closely interrelated with changes in what they look at and see. Thus, the two participants at the painting manage to align what they are looking at and seeing in the piece, if only for a moment, and achieve at least ephemeral intersubjectivity. Future research would be beneficial so as to explore the organization of the practices through which topics are produced at and in relation to particular features present in works of art. One important aim of such research should be to combine naturalistic studies in museums with the experimental methods deployed in museums that are currently being used in scientific and neuroscientific studies of art perception in particular (cf. Brieber et al. 2014).

Before bringing the chapter to a close, I would like to offer a final note on intersubjectivity. The comparison between achieving intersubjectivity in DVTs during optometric consultations and at exhibits in museums suggests that intersubjectivity is not a state of mind or a set of shared assumptions, as one might indeed derive from Schütz's (1967a) analyses. Moreover, intersubjectivity is not something which is stable; rather actions, such as writing a test result into a record form, need to be produced in order to fix what has been seen in concert with others in a particular moment to render it stable. Hence, with regard to DVTs, I have spoken of optometric intersubjectivity as one kind of intersubjectivity that is fixed in a particular institutional setting. Further investigations might explore this phenomenon in other institutions and how it relates to intersubjectivity in the laboratory sciences (Amann & Knorr-Cetina 1988) and in disciplines like archaeology (cf. Goodwin 1994) and ethnography (Emerson et al. 2011), where observations are shared among researchers through charts and written field notes. And finally, where an intersubjective experience is not fixed, it becomes an ephemeral phenomenon that participants continually achieve anew by producing actions that test whether or not co-participants still orient themselves

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to the world in the same way as they do. While the processes through which people achieve intersubjectivity differ between optometric consultations and museums, the analysis also suggests commonalities across these different settings. Further comparative research is required to reveal how intersubjectivity is achieved by participants in different institutional circumstances and how coherence across situations is produced, moment by moment, as circumstances change.

I began this chapter by pointing to the relationship between art and science created, for example, by artists like Vermeer, who used scientific instruments like lenses for the production of works of art. In the analysis, however, I moved away from the 'art/science binary' (Jones & Galison 1998a) and then turned to explore how, in ordinary circumstances, people produce visual phenomena. The analyses of how people achieve intersubjectivity and shared perception in different institutional settings and circumstances suggest that scientific concepts like 'experiment,' 'objectivity' and 'generalizability' bleed into and find application in ordinary situations. In these cases, in everyday situations, where people come together with divergent standpoints, interests, and attitudes, intersubjectivity is achieved through, as reflected in Garfinkel's (2006) quote in the opening of this chapter, 'experiments in miniature.' Therefore, the analysis also suggests that these mundane tests of co-participants' perspectives in ordinary situations are constitutive of experiments in professional settings, like optometric consultations and scientific laboratories.

Note

- 1 'An optimal VA [visual acuity score] of 6/6 [20/20] is often considered to be normal. In reality, this is true only for the average patient over 70 years of age. The vast majority of young patients (and many older ones) have an optimal visual acuity better than 6/6, and many young patients have a VA of 6/4 and even 6/3' (Elliott 2003: 36).

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