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Assessing Distance Vision as Interactional Achievement:

A Study of Commensuration in Action

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Abstract: The paper explores the organization of the Distance Vision Test as a process through which optometrists derive an objective test score from subjective assessments of their clients' quality of reading out lines of letters. The analysis of video-recorded optometric consultations explores how the standard letter-chart features in the interaction between optometrist and client. It examines specific fragments of test procedures to reveal how aspects of the chart are used by optometrist and client to practically organize the test and to determine the quality of clients' distance vision. The paper argues that the objective definition of the test result requires that optometrists carefully introduce clients to the test procedure to avoid the reading quality and the test result being influenced by influences such as anxiety. Only after this introduction to the test, clients are encouraged to read a line of letters that follows a larger line they had difficulty to read out from the chart. The quality of the reading out of this line then is transformed into the visual acuity score. This process of transforming incommensurable qualities, reading out and seeing, into quantities in order to make them comparable, is called commensuration.

Keywords: commensuration, optometry, distance vision test, social interaction, video, ethnomethodology

Das Testen des Sehvermögens als interaktive Leistung: die Vergleichbarmachung unvergleichbarer Qualitäten

Zusammenfassung: Der Artikel untersucht die praktische Organisation des Sehtests als einen Prozess, durch den Optiker einen objektiven Messwert erhalten, indem sie die Qualität der Leseleistung ihrer Klienten subjektiv bewerten. Die Analyse von Videoaufnahmen, die in optometrischen Untersuchungen gemacht wurden, untersucht im Detail, wie Optiker und Klienten die bekannte standardisierte Buchstabentafel in ihre Interaktion miteinander einbinden. Dabei inspiziert sie spezifische Videofragmente von Sehtests, um herauszuarbeiten, wie bestimmte Aspekte der Buchstabentafel von Optiker/in und Klient/in benutzt werden, um die praktische Organisation des Tests zustande zu bringen und die Qualität der Sehfähigkeit des/r Klienten/in zu bestimmen. Der Artikel argumentiert, dass Optiker Klienten allmählich in die Testprozedur einführen und dadurch verhindern, dass die Qualität des Lesens und damit das Testergebnis von Einflüssen wie Testangst und anderen Angstgefühlen beeinflusst wird. Erst durch die letzte Sequenz der Testprozedur, wenn der/die Klient/in ermuntert wird, eine weitere Zeile zu lesen, nachdem Schwierigkeiten aufgetreten waren, wird die Qualität des Lesens in einen Messwert verwandelt. Dieser Vorgang wird Kommensuration genannt, da er unvergleichbare Qualitäten –Lesen und Sehen – in Quantitäten transformiert, um deren Vergleichbarkeit herzustellen.

Schlüsselbegriffe: Kommensuration, Optometrie, Sehtest, soziale Interaktion, Video, Ethnomethodologie

1. Introduction

Optometry has long been a little investigated profession. Save for a small number of historical studies of the profession (cf. Begun 1981; Warnock 2005) we know little about how optometrists assess people's eyesight and eye health. This paper begins to address this gap in research and thereby contributes to the growing field of workplace studies (Heath / Luff 2000; Knoblauch 1996; 1999; Luff / Hindmarsh / Heath 2000; Suchman 2006). Over the past two decades workplace studies have shown how visual research methods, in particular video-based studies of interaction, can help reveal and describe the organization of the details of work practice in technology-rich environments. The present study adds to the discussion in this field by elaborating on how a professional and her/his client embed a standard technology, the well-known optometric letter-chart, within their interaction in order to arrive at an objective measure that describes the client's subjective experience of seeing.

Optometrists are professionals educated in the physiology of the eye and trained to investigate how to determine clients' difficulties in seeing and finding possibilities to improve their vision. One of the standard procedures and part of all optometric consultations is the Distance Vision Test. The test does not allow optometrists direct, unmediated access to clients' vision but involves a sequence of interaction through which the professional arrives at the visual acuity score that describes a client's clarity of vision in the distance.

In sociology, the process of transforming incommensurable qualities into comparable quantities or numerical scores is called "commensuration" (Espeland / Sauder 2007; Espeland / Stevens 1998). This paper examines this process as it is routinely instantiated in optometric consultations. It investigates how optometrists transform qualitative aspects of their clients' reading out of letters into a metric score and argues that the optometric procedure does not *measure* a client's visual abilities but that the test procedure *commensurates* seeing in the distance. In the analysis we unpack the activity of commensuration and examine the practical organization of this particular optometric procedure to reveal how professional practices transform qualitative into quantitative distinctions (Espeland 1998). We thereby inspect how the standard letter-chart is systematically interwoven with the interaction and used to gain access to and assess clients' clarity of vision. The paper has arisen from a project concerned with the practical work of optometrists. As part of the project we have gathered a corpus of 62 video-recorded optometric consultations. In the following, we turn to the analysis of the data and briefly discuss the context for the study and the approach taken to analyze the data.

2. Medical Interaction, Technology and Professional Practice

There is a substantial corpus of studies of language use and interaction in health care consultations (Heritage / Maynard 2006; Sarangi / Roberts 1999). While these studies have primarily been concerned with the organization of talk in interaction there is a small but growing interest in using video-recordings to examine the visible and material aspects of professional-client consultations, and the ways in which bodily comportment works with talk to accomplish particular actions and activities (Heath 2002; Hindmarsh 2009).

A related body of studies is concerned with the deployment of technologies in medical and healthcare settings, such as primary health care, surgery and anesthesia (Hindmarsh / Jenkings / Rapley 2007). These technologies principally are standardized tools, often designed to improve the workflow of activities and to enhance the effectiveness of doctors' communication with patients when gathering information that can be used to create databases about emerging

trends in the population's health. Research on these developments has investigated how the deployment of standardized technologies, such as electronic patient records impact patients, doctors and the medical system more generally (Berg / Winthereik / van der Ploeg 2007; Timmermans / Berg 2003a). Studies explore the double function of electronic patient records as memory device for general practitioners and accountability device for external parties (Berg / Winthereik / van der Ploeg 2007). However, they also note a lack of research about the practices and procedures through which doctors and patients interact with standardized technologies to produce standardized and recordable findings (Timmermans / Berg 2003b).

This gap in research on "standardization in action" (Timmermans / Berg 2003b) has been addressed by studies that use ethnomethodology (Garfinkel 1967; 2002) and conversation analysis (Sacks 1992) as their analytic and methodological framework. Building on a burgeoning body of research on "institutional talk" concerned with doctor-patient interaction (Drew / Heritage 1992; Sarangi / Roberts 1999) conversation analytic research has produced detailed analysis of naturally occurring sequences of talk in consultation rooms of GPs, psychiatrists, and many other healthcare areas (Heritage / Maynard 2006; West 1984). Coupled with the use of video-recordings as principal data this research has increasingly explored how participants' bodies as well as the production of paper-based and electronic records influence and feature in the interaction between doctor and patient (Greatbatch / Heath / Campion / Luff 1995; Heath / Luff 2000).

These studies point to the importance of bodily and visual alignment in consultations as well as to how the deployment of information technology influences the organization of doctor-patient interaction. They suggest that the layout of patient record forms impacts the practical organization of consultations. And they often argue that technology can disturb or even interrupt the organization of the interaction between doctor and patient (Luff / Heath / Greatbatch 1992; Pearce / Dwan / Arnold / Phillips / Trumble 2009; Scott / Purves 1996). These studies however primarily investigate systems used to document aspects of the consultation rather than technology that is deployed to play a part in the examination of the patients and their bodies. And they rarely explore the processes through which doctors turn qualitative descriptions and reports of subjective experiences into objective measures that can be compared across patients and used to track health trends and developments in society.

In related areas of research there is evidence of the social and interactional accomplishment and production of test results. Espeland (1998) argues that society has adopted the view that IQ scores are "objective" and independent from the contingencies of the situation in which intelligence tests are conducted. If those contingencies were taken into consideration IQ tests would be seen as "commensurating" rather than measuring people's IQ (Espeland 1998). This view is supported by the detailed conversation analytic studies by Maynard and Marlaire (Marlaire / Maynard 1990; Maynard / Marlaire 1992) that elaborate on the interactive production of intelligence tests. They reveal the procedures that introduce subjects to the test process and show how in the course of the interaction examiner and examinee arrive at a numerical score for their intelligence. This process of determining the IQ of a child is not a plain measurement but a cognitive ability that is produced in the contingently emerging interaction between examiner and examinee.

Commensuration as social process makes comparable two incommensurable qualities, such as solutions a person offers to a series of problems and the "measurement" of their intelligence or the ranking of law schools according to the research output of their staff (Espeland 1998; Sauder / Espeland 2006). Metrics like IQ scores or the ranking of schools can cause reactions by parents, policy makers, academics, administrators and others who use them to make decisions important for the future of institutions and people (Espeland / Sauder 2007). In this sense, commensuration has intended and unintended consequences because various parties treat a metric score as "objective" and relevant for their work and career trajectory. It there-

fore is a mechanism of reactivity as the common metric assigned to an organization encourages stakeholders to react in various ways (Espeland / Sauder 2007).

This paper contributes to these debates about measuring and commensurating by examining in detail how optometrists come to determine a client's visual acuity score. It differs from accounts that use a social constructionist (Latour / Woolgar 1979) or communicative constructionist (Luckmann 2008) perspective by focusing on the intricate details, the 'when' and 'how', of actual interaction between participants, here an optometrist and a client. The analysis inspects video-recordings of Distance Vision Tests conducted as part of ordinary optometric consultations. It explores the organization of the practices through which metrics are arrived at that describe a client's clarity of vision, in and through the Distance Vision Test. The Distance Vision Test therefore serves as a domain that provides us with an opportunity to study commensuration in action. Before examining the organization of the Distance Vision Test we briefly discuss the methods and data used for the analysis.

3. Methods and Data

The analysis examines video-recordings of Distance Vision Tests produced as part of routine eye examinations. It draws on the kind of video-analysis that has emerged from developments in ethnomethodology and conversation analysis (Heath / Hindmarsh / Luff 2010). Over the past two decades or so, this approach to the detailed study of human conduct has been employed within the sociology of work and organization, health and illness and other cognate areas of research for the examination of interaction in settings such as general practice (Heath 1986) and surgery (Sanchez-Svensson / Luff / Heath 2009), dentistry (Hindmarsh / Reynolds / Dunne 2009) and obesity clinics (Webb 2009), as well as museums (vom Lehn 2006) and PowerPoint presentations (Knoblauch 2012).

The analysis proceeds on a 'case-by-case' basis and involves the highly detailed examination of particular actions with regard to the immediate context and the specific interactional environment in which they arise. An important component of the analysis is the transcription of participants' talk and bodily action to facilitate the detailed inspection of the interactional character of particular actions and activities. The transcription of interaction requires the use of a system to map the occurrence of actions. In conversation analysis there is a long-standing convention to transcribe talk that captures what people say as well as when and how they say it (Have 1998; Jefferson 1984). For example, a "?" stands for a lowering of the voice, "::" for an elongation of a sound, "(.)" for momentary but audible pauses and "(3.3)" for a pause of three seconds and a third of a second. In the case in hand, a key aspect of the analysis of the Distance Vision Test is the clients' reading out of letters. In the transcript this reading out is shown by presenting the phonetic reading of the letters; for example, the 'normal' reading of a "V" is represented as "Vee", an elongated reading of the same letter is represented as "Vee::" and so forth; thereby, the capitalization indicates the letter that is being read.

Overall, we have video-taped 62 consultations conducted by nine optometrists in six optometric practices; they include 10 NHS clients and 52 private clients. A close examination of the recordings does not suggest that NHS and private clients are treated in different ways by the optometrists. At no point do the participants attend to the NHS or private status of the client. There however are noticeable differences in the length of consultations in different types of practice. Whilst in high-street chains consultations with an optometrist last approximately twenty minutes, the same consultation in commercial community practices can last up to one hour. Moreover, in commercial community practices optometrists often conduct the entire eye examination whilst in high-street practices some standard procedures such as the 'puffer test' and the taking of pictures of the eyes are done by trained assistants. Whilst these data have

been gathered in British practices the Distance Vision Test in the same way all over the world, including the United States and Asia.

Data collection was undertaken with a conventional camcorder mounted onto a tripod. The camera was switched on prior to the beginning of the consultation. To reduce the participants' reactivity to the recordings the researcher removed themselves from the consultation room for the duration of the consultation and returned only to change tapes. The cooperation of optometrists and clients was secured by informing them about the purpose of the study. We, thereby, followed the relevant guidelines by the ethics committee of the project's host institution, King's College London, and the NHS that granted us permission to include NHS clients in the study. Optometrists and clients were given the opportunity to opt out of their participation in the research at any time; both have been very supportive of the research and agreed that we could use video-clips and pictures from the consultations in presentations and publications.

4. Preparing Commensuration

Research on commensuration is largely concerned with the, often unanticipated, ways in which people and organizations respond to being measured and subjected to a test or study. Often this phenomenon is described as "reactivity" and seen as a problem for researchers because it contaminates or weighs on the outcome of their study (Espeland / Sauder 2007; McGivern / Fischer 2012; McPhail / Pickens / Smith 1975; Willmott 2011). Another difficulty with tests is that subjects' responses may be influenced by events occurring prior to them, in the environment of where the test is performed or by research subjects' fear of consequences the test result may have on them. Tests and studies, therefore, are designed to avoid or eliminate the consequences of reactivity, for example, by using placebo groups or creating test situations in which test subjects align with the test procedure without changing their behavior in response to it.

This kind of reactivity is addressed in the DVT. When turning from the history taking to the DVT the practitioners setup a quasi-experimental situation in the consultation room where the client sitting in an examination chair faces a standard letter chart on the opposite wall. The letter chart is projected onto a screen on the wall in front of the client; the size of the letters and the composition of the chart are selected by pressing buttons on a remote control that lies on the optometrist's desk (Figure 1).

Figure 1: The Optometric Examination Room and Test Chart

Source: own data

The DVT begins when the optometrists occasions the client to look to the chart and read out letters shown on it by deploying a formulation that implies that at this point in the consultation the optometrist does not know the client's clarity of vision and therefore with the formulation deploys a technique to begin to gain access to the client's visual experience. In fragment 1, the optometrist brings the history taking to a close and then occasions the client to shift orientation and turn to the chart, "look to the letter chart straight ahead for me" (line 2).

The optometrist asks the client, who wears a pair of glasses, to read letters from the chart, "So whats the smallest line you can read there?" (line 2–3), a formulation very similar to the one suggested in textbooks. While the optometrist voices the request she covers the client's left eye with an occluder, a plastic, non-transparent patch, and looks at her. The occluder comes to rest on the glasses in front of the client's left eye when the optometrist begins to say, "smallest", and then turns to the desk where the remote control is that shows the composition of lines presently shown on the chart. The client briefly, but noticeably, hesitates (line 4) before beginning to read from the chart just when the optometrist swivels the chair back to the right and orients to the client, "enN (.) c Cee eNn (.) Kay" (line 5).

By asking the client to self-select the lowest line she is able to see sufficiently clear to read out the optometrist creates a situation in which the client is required to look at the chart and make a decision about what line is appropriate to select from the four lines displayed on the chart. The short pause inserted between the optometrist's question and the client's reading suggests that they might be searching for and deciding on, a row of letters to read out. Occasioned by the noticeable pause the optometrist turns to the left where the desk demarcates a work environment different from the client's eye and vision. The optometrist's shift in orientation to the desk displays a withdrawal of recipiency (Goodwin 1981; Heath 1986; Maynard / Marlaire 1992) that is restored when she turns her head and body back to the client. A moment later the optometrist turns back to the client occasioning her to begin to read; she treats the optometrist's visible orientation to her as display of recipiency (Figure 2).

Figure 2: Fragment 1

1 O: I first check what you can see first of all so if you just
2 look at the letter chart straight ahead

for me (.) okay? so
3 whats the smallest line

you can read there?
. . . . .
4 (.9) . . . . . .

5 C: enN (.) c Cee eNn (.) Kay

Source: own data

The analysis suggests that the production of the opening sequence of the DVT involves the use of formulations coupled with bodily action that realign the participants' orientation and engagement with each other. First, they transform their face-to-face engagement into a bodily configuration of visual dis-alignment; the client looks to the chart and the optometrist observes the client without making eye contact or looks to the screen behind the client. And second, occasioned by the optometrist's formulation, "so whats the smallest line you can read there?" (line 3-4) the client reads out a line from the chart (line 5).

The particular formulation that the optometrist deploys to begin the Distance Vision Test is similar to the one recommended by textbooks in optometry (Elliott 2003); all nine optometrists in our body of data use this formulation with at least one client. Apart from the textbook

formulation we find that optometrists use two other kinds of formulation to encourage clients to read from the chart.

Figure 3: Fragment 2

1 O: On the letter chart (.3) with your right ey:e (.) can you

2 O: read to me the letters in the top row

3 P Deeh eNn yoU Eh ahR

Source: own data

In fragment 2 (Figure 3), the client begins to read from the chart (line 3) immediately after the optometrist's question, "can you read to me (.) the letters in the top row?" (line 1 – 2). The question is embedded within an action that moves the consultation from the history taking to the beginning of the Distance Vision Test. It is produced when the optometrist visually and bodily turns to the chart and says, "on the letter chart" (line 1). She then returns to look at the client and places an occluder in front of his left eye while saying, "with your right ey:e" (line 1).

On completing the utterance, the optometrist has covered the client's left eye and opens the Distance Vision Test, "can you read to me (.) the letters in the top row?" (line 1-2). As she produces the request the optometrist withdraws her eyes from the client and turns to the letter chart displayed as a mirrored image on the screen behind the examination chair. The client has not moved his head or body since the optometrist has placed the occluder on his left eye. With his right eye he looks to the chart reflected in the mirror and begins to read the top line of letters immediately following the request, "Deeh eNn yoU Eh ahR" (line 3). From here on the Distance Vision Test takes its course.

The analysis suggests a certain organization of the opening of the Distance Vision Test. It involves an action that transforms the participants' visual orientation from a face-to-face en-

counter to one in which the client looks to the chart while the optometrist makes themselves familiar with the chart and then monitors the client's reading. The client aligns with the optometrist's encouragement to read out lines of letters from the chart. In light of the formulation used by the optometrist the client needs little time to identify the line to read from the chart.

In a few cases in our corpus the optometrist uses a third type of formulation to begin the Distance Vision Test. Rather than encouraging the client to start reading on the top row the optometrist specifies a particular line on the chart to start the test. Drawing on information from the history taking and the client record form optometrists sometimes are able to make an informed assumption about the client's visual acuity and select a line of letters to read from the chart. They do not know the client's visual acuity but by interviewing the client and reading the record form they are able to guess the smallest line the client will be able to read out.

Figure 4: Fragment 3

1 O: look ahead to the chart right at the end the:re

2 P: mhm
3 O: just to check your vision
4 P: [mhm]
5 O: [so] I cover this eye he:re

6 P: mhm
7 O: and if you can read anything on the middle li:ne

8 P: e::hrm eFf eMm Peeh Deeh yoUh

Source: own data

In fragment 3, the optometrist occasions the client to look to the chart and then prepares him for the test, "just to check your vision" (line 3) "so I cover this eye he:re" (line 5). Her utterances are accompanied by an action that slowly covers the client's left eye. She moves the occluder underneath the client's line of sight before slowly moving it from the client's left side in front of the eye. The occluder arrives in front of the client's eye just when the optometrist voices the slightly extended, "he:re" (line 5). The client attends to the optometrist's actions, "mhm" (line 2, 4 & 6), and begins to voice the letters of the middle line in response to the optometrist's request (line 7), "e::hrm eFf eMm Peeh Deeh yoUh" (line 8). The brief hesitation in the client's response to the optometrist's question suggests that he prepares himself

for the reading out of the requested line and focuses his vision on it before starting to read it out.

By virtue of this particular formulation the optometrist selects a line other than the top line of letters and thus potentially shortens the duration of the DVT because there are fewer lines left on the chart to read. Interviews with optometrists suggest that they use this formulation to reduce the repetitiveness of the activity and save a little time on the test. The selection of the line on behalf of the client requires the optometrist to be sufficiently confident to make an assumption about the client's visual acuity. Such confidence may be derived from experience in the job or from the amount and the quality of information gauged from the record form and interview.

The effective performance of the DVT and the possibility that it arrives at an accurate test result relies on the test procedure to be produced in a way that there is no doubt about its integrity and the accurateness of its result. This procedure involves the setup of the Distance Vision Test as a quasi-scientific experiment to exclude external events that may impact the test result and that the client independently reads out letters from the chart. It begins with the optometrist voicing the opening formulation that introduces the client to the Distance Vision Test and implies a particular trajectory of action, i.e. the reading of a line of letters from the chart. The analysis therefore reveals that the opening of the Distance Vision Test is made up of a two-part sequence of action, the opening formulation and the client's reading of a line of letters. This two-part sequence of actions prefigures the organization of the Distance Vision Test that follows from it.

Our analysis suggests that information about the client's state of vision gauged from the record form and from clients' conduct in the early part of the consultation as well as the optometrist's professional experience influence the choice of formulation deployed to open the Distance Vision Test. We have found that in response to the specifics of the test situation optometrists use three different types of formulation to begin the Distance Vision Test: (1) the optometrist asks the client to self-select the smallest line they can read out, and (2) the optometrist asks the client to begin the test with the top line on the chart. And (3) the optometrist selects a line of letters below the top line and encourages the client to begin the test with that line. Each formulation occasions a slightly different response from the client; most notably is the occurrence of pauses prior to the reading out of letters when they are asked to self-select a line; pauses that display the client's reasoning about an appropriate line to read out.

The analysis suggests that optometrists' choice of formulation arises in response to circumstances external to the immediate situation at hand. For example, optometrists sometimes are subject to time pressure as consultations are delayed and clients who have been in the waiting area for a lengthy period display their impatience. Or from taking a client's history and measuring their current glasses they have some knowledge about their visual abilities that they bring to bear when opening the test. In both cases, they often choose a formulation that does not require the client to read out the chart from the top but one that can help to shorten the DVT. Hence, whilst the DVT is setup to create a quasi-experimental situation that externalizes events occurring outside the consultation room, optometrists respond to knowledge and information gathered prior to conducting the test when voicing the opening formulation.

5. Moving towards Commensuration

With the opening formulation the procedure of commensurating the client's clarity of vision has begun. It continues when the client has read the first line of letters from the chart. Occasioned by the client's reading the optometrist encourages them to continue to read out further lines of letters and monitors their reading. A two-part sequence of actions emerges that is

structured by the client reading a line of letters and the optometrist acknowledging the reading. While the client reads the optometrist monitors the client's actions by carefully listening to the patient's voicing of letters. The client's ability to read lines of letters from the chart is treated as a proxy for their ability to see clearly in the distance. In fragment 4, the optometrist asks the client to identify "the sma:llest that you can go to↓″ (line 4). When the client names the line rather than read it the optometrist reformulates the encouragement and asks the client to read out letters starting at "the top line and right the way down" (line 7).

Figure 5: Fragment 4

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1     O: lets just check your vision first with your glasses so you
2        have bifocals so look at the letter chart
3     P: yah
4     O: straight ahead I cover this eye whats the sma::llest that you
5        can go to↓
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6     P: I can read them a:ll
7     O: read it for me (.) read the top line and right the way down
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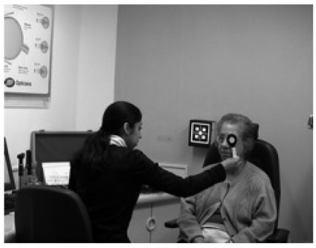

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8     P: okay kay vee deeh eff
9     (.)
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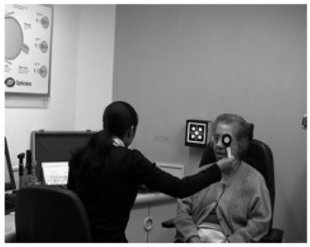

```
10    O: yah
11    P: and then oh enn eff peeh
12    O: yah
13    P: ell c ccee enn kay
14    O: mhm
15       can you try the top one?
16    (1.3)
17    P: eeh ahr peeh (.) deeh
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Source: own data

The client reads the top line from the chart, “okay Kay Vee Deeh eFf” (line 8); the reading is done in an even pace, one letter at a time, each letter clearly pronounced and separated from the prior by minute pauses of equal length. The reading of each line of letters is noticeably brought to a close, rendering it recognizable as a turn in talk, the co-participant can orient to. It is very common for optometrists to voice an acknowledgment token or produce a head nod following the client’s display of the reading of the last letter in a particular line. The acknowledgement tokens used in this place, “yah”, “good” or “okay”, attend to the client’s reading without assessing it.

In fragment 4, the optometrist attends to the client’s reading of the first two lines of letters, “yah” (line 10 & 12). Following the reading out of the third row the optometrist changes the acknowledgement of the reading from “yah” to a quiet, “mhm” (line 14). By virtue of this change in the acknowledgment token the optometrist attends to the repair in the client’s reading of the letter “C”, “Cc ccee”, within the third line (line 13). Such repairs or other kinds of disturbances in the equal pace and rhythm of the reading out of letters are treated as displays of emerging difficulties in seeing clearly a particular line on the chart; they include changes in pace, an elongation of letters, pronounced pauses before a letter, sometimes filled with a token like “ehr”, and the client repairing her / his reading of a letter. The changes in the reading pattern are produced as difficulties to see the line or letter clearly and not as difficulty to read the line; for example, clients account for some such difficulties by saying that this was their poorer eye or apologize that they were not able to read the line out. Optometrists attend to these difficulties as instantiations of their visual experience of the letters on the line they have (attempted to) read out. They allow the optometrist to assume that maybe with this row the client has arrived at or near the limits of their ability to see clearly in a given distance. Following the change in acknowledgement token the optometrist calls up another chart and asks the client, “can you try the top one” (line 15), a request that implies that possibly she will not be able to read out some or even any of the letters.

The sequence made up of reading and acknowledgment suggests that the participants treat the letter chart as a technology that helps to structure their interaction. The optometrist attends to the client’s reading of a row of letters by providing an acknowledgement that occasions the client to produce the next turn by reading the next row. In this sense, the oral or visible response to clients’ reading suggests that optometrists treat the completion of the reading of a row of letters as a turn in talk, or a “transition relevance place” (Sacks / Schegloff / Jefferson 1974). They produce a next turn by producing an oral or visible acknowledgment encouraging the client to continue with the reading. In this way, the structure of the chart is used to structure the interaction.

We can see that commensurating the clarity of vision with the reading out of letters involves procedures and standards for the assessment of visual ability. The standard letter-chart does not provide a formalized criterium but is a working professional methodology for organizing and working through the Distance Vision Test and commensurate the client’s quality of reading and their visual abilities. The standards of the test are not fixed properties, but are contextually contingent judgments that pertain to a given client’s particular way of reading. It is the variation within a given performance that constitutes the standards for measuring and for defining evidence of vision.

There are general principles for ‘possible sources of evidence’ that can be used to make sense of clients’ reading out of letters. Variations in the rhythmic reading of letters in terms of pauses between letters; pauses before reading a row of letters; elongated reading of an individual letter; phrasing or explicit articulations of uncertainty – all of these changes in a client’s reading are attended to by the optometrist as indicators of problems with the clarity of their vision with regard to a particular line of letters. This sensitivity to changes in clients’ reading of letters requires optometrists to establish the ‘normal’ way of reading within a given consultation.

The initial turns at reading sequences provide, then, a benchmark against which assessments of variation can be made. Thus, while the general methodology for assessment may be transferable, the specific standards for the assessment are indigenous to, and a product of, particular consultations. Indeed, in some instances, the optometrist may actually need to alter the conditions of the test by, for example, increasing the size of letters or moving the chart closer to the client that a client with poor visual acuity can participate in the test. Again, the standards of the test are contextual, and need to be established within the context of a given consultation.

In the course of the unfolding test, lines become smaller and therefore more difficult to see and read out. Clients mark the arising difficulty by changing the reading pattern, by pausing between and elongating letters, and in other ways. It is critical for the professional performance of the optometrist to be sensitive to such changes in the client's reading from the chart and attend to it. In our data, the optometrists display their sensitivity to clients' clarity of vision by changing or modulating the design of the token they deploy to acknowledge the reading of a particular line. The acknowledgment token encourages the client to produce the next turn and read another line. If the client does not begin to read the next line after this encouragement the optometrist treats the noticeable pause as a display of the client's difficulty in seeing the line sufficiently clearly to read out.

We therefore begin to see how reactivity to the process of assessing a client's visual abilities is a critical feature of the Distance Vision Test. Throughout the test procedure optometrists are sensitive and respond to the possibility of reactive responses of clients when commensurating their clarity of vision. By virtue of the design of their formulations optometrists display that they aim to gauge clients' responses to particular lines on the chart and not to the request to read from the chart. They therefore choose inconspicuous acknowledgment tokens that confirm but not judge the quality of the reading out of a particular line. Thus, their actions mediate the organization of the test but at the same time are designed to not influence the test procedure and outcome.

6. Commensurating Distance Vision

The reading of the lines of letters introduces clients to the principal organization of the test procedure, i.e. lines are read letter-by-letter, starting with larger lines downwards. If a client diverts from this organization of the test the optometrist provides her / him with relevant instructions. When reading these initial lines clients often establish a certain pace and rhythm that gains significance as the test proceeds. Each reading of a line is acknowledged by the optometrist who voices acknowledgment tokens until the client displays difficulties in reading out a line of letters. Thereby, optometrists attend to changes in the patterns of the reading out of letters and treat them as displays of potential difficulties with the seeing of a line of a particular size. Whilst up to this point the optometrist may have conducted an administrative activity as s / he listened to and acknowledged the reading, now s / he noticeably turns to the client and initiates the part of the test when the visual acuity score is determined.

In Fragment 5, the optometrist asks the client to "guess the second row from the bottom" (line 26-27). So far, the client has read five rows of letters from the chart with little difficulty. Having read the fifth row he suggests that the remaining two rows are hard to see for him; he briefly pauses and then turns to the optometrist saying, "last two are" (line 25) while waving his hand left and right, a gesture that embodies the notion of "shaky" and the optometrist draws on with her subsequent utterance (line 25). The discovery of the lines that are "a bit shaky" prefigures the optometrist to formulate a request, "could you guess the second row from the bottom" (line 26-27) (Figure 6).

Figure 6: Fragment 5

25 P: (last two are)

26 O: =just a bit shaky could you guess the second line from the

27 bottom do you think? (.3)

28 P: yah eh: (.3) Dee Vee aI yoU eNn

Source: own data

The request occasions the client to reengage with the test and read a particular line from the chart after he had suggested that he was not able read out any further letters from the chart. By placing the request immediately after the acknowledgment of the client's display of difficulties with the "last two" the optometrist ensures the client's continued engagement with the test. As the optometrist begins to voice the request she glances over her shoulder to the chart occasioning the client to re-orient to it and then asks him to read one of the lines he finds difficult to see.

The design of the request involves a preface that implies the client might not be able to read all or even any of the letters in that row. By prefacing the encouragement with "could you guess" (line 26) and similar wordings optometrists orient to the difficulty clients have with the reading of the previous line. It implies an assumption that clients hope to do well in the test that may be based on the way in which clients often display they wish to avoid failure and in which they account for mistakes and difficulty to read out letters by prefiguring the test with "this is my poor eye" or by saying "I didn't do as well as I should have" after the test.

The design of the request attends to the client's reading performance on the previous rows. In fragment 5, the client reads rows from the top of the chart until arriving at a row that indicates he has normal, that is 20 / 20 vision. Encouraged by the optometrist the client shifts his orientation back to the chart and reads the next row down, "Dee Veeh aI yoU eNn" (line 28). The reading of the requested line brings the Distance Vision Test to a close. The optometrist reads the visual acuity score of the chart and makes a note of the number of letters the client read wrongly on this row, for example "6 / 6 -2", before initiating the next part of the eye test.

In some cases, the optometrist asks the client to read a line of letters that the client might not be able to read out at all. The selection of such a line arises when the client's previous reading performance suggests that they may be able to read the line. In fragment 6, the optometrist begins the Distance Vision Test by selecting a particular line of letters for the client to read. He uses a computer system to underline the row on the chart and then asks the client to "have a go (to read) that line that's underlined" (line 8-9). The client looks in front and reads, "thats Vee yoU Pee Eeh oh (.) its eether Ee or eFf ahR:" (line 10-11) (Figure 7).

Figure 7: Fragment 6

8 and whats thee:: eh actually have a go (to read) that line

9 thats underlined ([ )
10 P: [thats vee you pee eeh oh (.) its eether ee

11 or eff ah:
12 O: >good< an:d can you get any (.) from thee: next one down now

13 P: .hh eff you zed (.5) veeh (.3) eff you zed (.) looks like

14 eff beeh or eeh beeh
15 (.)
16 O: excellent good (.)o( )o ((O types on key board xxx (.)

By questioning her ability to see a line of letters, "its eether Eeh or eFf ahR:" (line 10) the client suggests that she may be able to read at least some of the letters on the presented line. The optometrist attends to her performance while she reads out letters from the chart. As she hesitates and then repairs her reading the optometrist turns from the desk in front of him to the chart monitoring her performance. When she brings the reading of the line to a close he asks her to read the next, smaller line of letters. He designs the test request carefully, asking the client whether she can "get any from thee: next one down" (line 12). By virtue of this formu-

lation the optometrist accommodates the possibility that the client may not be able to read any of the letters in that row. It occasions the client to read the line, if with some difficulty, ".hh eFf you Zed (.5) Veeh (.3) eFf yoU Zed (.) looks like eFf Beeh or Eeh Beeh" (line 13-14). As with the previous line, the optometrist first turns to his desk after the request but returns his orientation to the chart when the client hesitates (.5) and repairs her reading.

The design of the request prefigures a possible outcome of the test. Rather than asking the client to read the next line down, the optometrist enquires whether she "can get any" letters from the next row. Thus, the optometrist encourages the client to try to read out the next line whilst implying that she may find it difficult to discriminate and read "any" of the letters. The projection of possible difficulties in reading the next, smaller line of letters was also used by the optometrist in fragment 1 ("could you guess the second line from the bottom do you think", lines 12 and 13) and fragment 2 ("can you try the top one", line 15). By allowing for errors in the reading out of letters the optometrist deploys a method that encourages the client to try to read out the specified line without "losing face" (Goffman, 1967) when they make mistakes or are unable to read out any of the letters.

Tests like those at opticians are potentially "face threatening" situations (Goffman 1967). The request that initiates the commensurating and encourages the patient to read one more line of letters might be based on the optometrist's overestimation of the client's ability to see in the distance. It can potentially create a situation in which the client is unable to see any of the requested letters. Such a situation would put into question the clients' visual faculties as well as the optometrists' professional competence in being able to assess clients' visual acuity. Therefore, both participants perform face saving activities prior to and following the request that encourages the client to try to read one more line of letters after having had difficulties with a previous line. Clients therefore sometimes enter the test with apprehension and display anxiousness (Court / Greenland / Margrain 2009); we noticed a slight trembling of the hand that covers the eye with an occluder, hesitation in reading the first row from the chart or a breathless lurch into reading the row displaying an attempt to compensate for nervousness and apprehension. Furthermore, clients display a concern to 'get it right' and perhaps even 'to show that they are concerned to get it right' by displaying effort in reading smaller rows of letters; for instance, clients squint their eyes, lean slightly forward and use repairs in the vocalization of letters.

Optometrists take the reading performance into consideration when they formulate the request that asks the client to read one more line. In particular, they orient to the way in which the client has displayed difficulties in seeing and reading out the prior line of letters. When producing the formulation through which the client is asked to read out the next smaller line of letters the optometrist makes sure the patient does not feel pressured or in danger of losing face (Goffman 1967) as it is possible they will be unable to read all, or even any, of the letters in that line.

Once the client has read this line of letters the optometrist determines the visual acuity score. Irrespective of the reading performance in previous lines, optometrists use the client's reading of the last line of letters. It is critical therefore that optometrists can encourage clients to read the next line to the best of their abilities, without reflecting on their performance in reading out previous lines. The design of the encouragement to read one more, smaller line of letters produced by the optometrist avoids to engender "reactive responses" (Espeland / Sauder 2007) from the client. It puts the client at ease as it is without problems to not even be able to read any of the letters on the chart. The client in turn attends to the design of the request by displaying that they try hard and often prefigure the reading of the line with suggestions that they might not be able to read some or all of the letters in that line. The actions by the client arise in light of their reading performance in previous lines anticipating possible problems

with the reading of the next line and preempting potential reactive responses by the optometrist.

We therefore can see that in the process of commensurating distance vision reactive responses arise in interaction between the two participants in the consultation. They are not produced in attending to the co-participant's request to read or in reading out a line but they are interactionally accomplished and emerge as both participants anticipate possible reactive responses of the other. This way optometrist and client assure each other that they are committed to the DVT and thus ascertain the integrity of the test.

By writing the visual acuity score in the client record form the optometrist brings the commensuration of the distance vision to a close; the score now makes comparable the qualities of clients' clarity of distance vision and their ability to read out lines of letters. It is treated as information to judge the client's ability to see clearly in the distance and can be used to compare the client's state of vision with previous consultations, with information about their vision they have provided in the interview, or with the abilities of other clients. Such comparisons provide optometrists with a base where to continue the assessment of the client's vision in later parts of the consultation.

7. Discussion

Commensuration transforms qualitative features of 'objects', such as events, actions, cognitive abilities and such like, into quantitative metrics. It allows for a comparison of such objects that otherwise would be incommensurable. In optometric consultations these objects are on the one hand the reading out of lines of letters and on the other hand the quality of clients' visual ability. In order to make these incommensurable objects comparable optometrists deploy a standard procedure and a standard technology, the letter-chart, that focus and structure the interaction of optometrist and client. The standard procedure and technology provide a professional methodology to work through the test and organize the participants' activities. The letter-chart allows the optometrist to select appropriate lines for the client to read out. The client's reading out of letters is produced in response to the optometrist's request displaying that they attend to its professional purpose; changes in the pace of reading as well as repairs are treated not as difficulties to read out letters but as difficulties to see in the distance. Optometrists therefore do not measure clients' clarity of vision but they assess their ability to see clearly in the distance by comparing the quality of the reading out of the last line of letters from the chart with a professional score associated with that line.

When beginning the Distance Vision Test optometrists have little or only partial knowledge of clients' visual abilities. They conduct the history interview (Webb / Heath / vom Lehn / Gibson 2013) to find out about possible problems with clients' vision. The Distance Vision Test then is begun with the selection of a line of letters the client is able to read. For the selection of that first line to read out and the formulation optometrists use to encourage the reading they draw on their knowledge about clients. As with tests in other institutional contexts clients can be unnerved or anxieties can arise in response to the test when they have a bad start into the activity. Therefore, the beginning of the Distance Vision Test can be seen as an activity that introduces clients to the procedure and eliminates possible anxieties.

As we have seen from the analysis, the reading out of letters and optometrists' acknowledgement of it in the beginning of the Distance Vision Test are inconsequential for the end result of the test. Indeed, optometrists often pay only partial attention to this part of the test and engage in administrative activities while clients read from the chart. Only when clients display difficulties by changes in reading patterns and pace optometrists shift their orientation to them. They then turn the preparatory interaction conducted by virtue of the reading of lines of

letters from the chart into a short sequence of interaction that commensurates the quality of the reading out of letters with the professional acknowledged visual acuity score. Thereby, they are interested only in what the smallest line of letters is a client can read and in how many of the letters s / he is able to read from that last line. They read the score off the chart and write it in the client record form with a number added that indicates how many letters in the last line clients were unable to read; thereby it is irrelevant for the optometrist which of the letters clients are unable to read out. The writing of the visual acuity score in the client record form brings the commensuration to a close.

The analysis argues that the process of commensuration itself is fairly short and comprised only of a two-part sequence of action, the optometrist's formulation that encourages to read one more line of letters and the client's reading of that line. The effective production of the Distance Vision Test however relies on the elimination of reactivity from the commensuration of distance vision. Therefore, optometrists carefully prepare clients and themselves for the commensuration by virtue of the sequence of action that involves the reading out of letters and the neutral acknowledgement of that reading. This sequence of action coupled with the information gathered in history taking prefigures the optometrist's selection of a suitable formulation to conduct the commensuration of clients' distance vision.

The paper therefore contributes to our understanding of how commensuration is achieved in interaction between optometrists and clients and unpacks the organization of the process produced by the participants in the Distance Vision Test. Thereby, it explicates how standards, namely the standard procedure and the standard letter-chart, are embedded and serve as professional methodology, within the test. Aside from debates about commensuration (cf. Espeland 1998) and standards in action (Timmermans / Berg 1997) the paper also provides some insights into the reasons for optometrists' reliance on the Distance Vision Test and the use of the letter-chart as a technology that over the past 100 years has changed very little. This is despite the fact that over recent years optometry has developed technology to objectively measure what an eye can see in the distance (cf. Elliott 2003). Our analysis suggests that as with other kinds of tests and challenges test subjects need to be familiarized with the procedure and their minds put at ease to avoid that the test result is spoilt by other influence such as anxiety. In the assessment of clients' distance vision the deployed procedure facilitates and prepares the required involvement of clients in the test. Moreover, the Distance Vision Test is only one of many procedures that clients are being subjected to as part of the optometric consultation. Hence, aside from serving to find out a clients' ability to see in the distance it also helps to increase their involvement in the consultation.

Finally, aside from adding optometry as a new work setting to the growing body of workplace studies (Luff / Hindmarsh / Heath 2000) by using video-recording as principal data the paper also adds to the debate about the somatic turn in social sciences (Vannini / Waskul / Gottschalk 2012). Video thereby allows us access to the organization of participants' bodily and material actions to examine how a participant uses another's oral, bodily and visual actions to make judgments about what they look at and how they see it in the distance. Further studies will pursue research on optometric practice and explore how this profession uses other kinds of tools, technologies and procedures to assess other of their clients' visual abilities.

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