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Metaphoric pictures devised by an early-blind adult on her own initiative

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Abstract. EW, a totally blind adult, was encouraged to draw. Three years later, she took a sketchpad on a vacation trip to Mexico and made a series of drawings. In these pictures, objects, such as a glass or a person swimming, are drawn in a realistic manner in which lines stand for surface edges, and the shapes copy parts of the true forms of the objects. Of major interest, EW made drawings in which the lines and forms stood for the effect of the alcoholic liquid in the glass, the taste of a hot pepper, the sound of a trumpet, and the feeling of water running through the fingers of the swimmer. It is suggested that EW has invented apt metaphoric devices on her own initiative.

1 Introduction

This is a case study of a blind woman who, it is proposed, drew metaphoric pictures. Experiments on haptic pictures have supported the claim that blind people can recognise metaphoric devices made by others, and can invent metaphoric devices if asked to tackle specific problems (Kennedy and Merkas 2000). What is new here is that the problems were selected by the blind person, and that apt devices were invented on her own initiative.

Eriksson (1998) reports that over the past two centuries raised pictures were made for the blind in some progressive schools, but their use remains controversial (Hayhoe 2003; Lopes 1997). Formal experimental investigation of raised pictures for the blind dates from Merry and Merry (1933) and becomes extensive only from the 1970s (Millar 1975), involving blind adults and children with different kinds of experience (D'Angiulli et al 1998; Heller 1989; Heller and Ballesteros 2006; Lederman et al 1990).

Common objects drawn in parallel or linear perspective might be described as literal copies of the objects under these projections. Indeed, the shapes on the picture surface often are the 'true form' of a part of the object (Willats 2005), ie a rectangular door is depicted by a rectangle on the picture surface. Further, lines in outline drawings are perceived as surface edges. This principle may hold for vision and touch, and can be considered a basis for 'literal' outline pictures (Kennedy 1982; Kennedy and Bai 2000).

Objects have many properties outside the realm of literal depiction. Gaia, a blind girl of 12, was asked to draw a wheel in motion and said that pictures cannot show motion (Kennedy 2003). A blind man asked to draw wheels in motion (steady spinning, wobbly motion, and jerky motion) drew lines of motion flowing behind a spinning wheel, made the wheels unrealistically elongated to suggest wobbly motion, and drew the wheel twice to suggest jerky movement. The devices were intelligible to sighted subjects (Kennedy and Merkas 2000).

In no studies have pictorial devices spontaneously invented by the blind been investigated. Here we report just such a case. It is useful as evidence that the devices do not require forcing, ie external demands. They are not just the hothouse flowers of highly artificial, experimental circumstances. They are not triggered if, and only if, requests for drawings are made by sighted pedagogues. Also, to date, the highly specialised experiments on metaphor, pictures, and the blind have a restricted cast of investigators.

One must wonder about bias and Clever Hans effects. A spontaneous case is an important addition.

In brief, EW is a congenitally blind woman who drew very little from childhood until her early 30s, when, after moving to Germany, she met Elke Zollitsch, an elementary school teacher, who encouraged her to try a raised-line drawing kit. Three years later, in September 2006, EW took a vacation trip to Mexico, taking her drawing kit. On her own initiative, she made 17 drawings, each with a distinctive subject. Here, I select for analysis 4 in which lines are used for referents that are not surface edges (figures 1 – 4).

2 Case study

EW was born in Japan in 1972. She was totally blind early in life as a result of retinal blastomas. Both eyes were surgically removed, the right eye at 11 months and the left eye 6 months later. Following her BA from a 4-year university course in Tokyo (a degree from an English literature and linguistics department) and an additional teacher-training programme for junior and senior high schools as an English teacher, she moved to British Columbia for 2½ years to obtain a Master of Library and Information Studies degree. Subsequently (in 2000) she moved to Germany and in 2003 met Elke Zollitsch. EW (April 30, 2007) wrote: "[An] association invited us both [to] Berlin as guest speakers. We kept in touch afterwards and since we both live in Bavaria (about 4 hours' train and car ride between us), we have met up every now and then."

In her classroom, Zollitsch has had extensive experience with two blind children, who made raised-line drawings, for example of a clown, a sledge, a chieftain, a car, and birds. The drawings made by the two girls at the ages of 8 and 9 years (Zollitsch 2003, pages 15 – 123) are like drawings made by sighted children in first and second grade (Golomb 2002).

EW reports that she was interested in drawing as a child but was actively discouraged by her teachers. "My art teachers in my elementary school", she said in my interview with her, "when I tried to draw they laughed at me". Her art teachers, she remembers, said the object "doesn't look like that". Of one drawing, she recalls, a teacher said: "It doesn't look like a horse. It looks more like a pig". As a result, she reports "she never learned to draw ... totally blind children worked with clay".

In Fall 2006, in a visit arranged by Zollitsch, EW brought the Mexico sketches to show me in Passau, Germany. I interviewed EW for about 2 h. The goal was to discover the main referents of each picture. As each picture was given to EW, she described its purpose. Any questions I asked EW about parts of a picture were non-directive eg "What does this part of the picture stand for?" or "What does this part of the picture show?". I placed EW's finger on parts of the picture while asking these questions, and guided her along the relevant lines. She then explored the picture herself while answering the question. Since each picture contained many lines, it was not possible to ask about the meaning of each and every part. I made no comment about the theoretical interests raised by the pictures during the questioning. I had an opportunity to e-mail her in early 2007, and to interview her again in person in June 2007, always with non-directive questions. I asked similar questions by e-mail in July 2007. In June I also interviewed her husband, a teacher of English. He informed me that although he drew a map of Mexico for her at the start of their trip, EW is private about her drawing, and he had not discussed her drawings with her for more than about 10 min. She selects her own topics and makes her own drawings. (He indicated he learned a good deal during my interview with her in June, and showed considerable interest.) Besides informal conversations with Zollitsch in 2006, I interviewed EW by e-mail in October 2007 and January 2008. Any e-mail quoted here from EW or Zollitsch is given with punctuation, spelling, and wording as in the original.

The lines in EW's pictures appear to the eye as white. For clarity's sake they are reproduced here as black lines. As before, since each picture contained many lines, it was not possible to ask about the meaning of each part.

EW draws using a raised-line drawing kit. Her drawings are made on sheets (30.5 cm by 22.5 cm) in the form of a thin plastic sleeve, sealed along three edges. One of the 22.5 cm edges is left open. Through the opening, a slim board with a rubberised front surface can be inserted into the sleeve. With this backing, when a ballpoint pen writes on the plastic sheet, the plastic crinkles and forms a thin raised line. It is tangible on the side from which pressure is applied.

3 Results

EW drew a line about 3 cm above the bottom of each picture, and wrote her initials, the date, and the topic of the picture. Most of the pictures are oriented as portraits (30.5 cm top to bottom) but some are landscapes (22.5 cm top to bottom). Figure 1 shows a glass of tequila. EW has written TEKILA at the bottom of the drawing, and dated it 12.09.06. EW described the glass as a "very nice, long simple glass". The drawing is symmetrical—a trapezium narrow at the bottom, with three pairs of parallel lines across the glass. The pair at the top depicts the rim. One pair of parallel lines depicts "where the liquid is". Another pair is to suggest "the thickness of the glass". Long vertical lines run from the base of the glass to the top of the picture. These are straws. Lines arc from the lower interior of the glass as freehand sinusoids. EW said: "if I get too much, I feel like this".

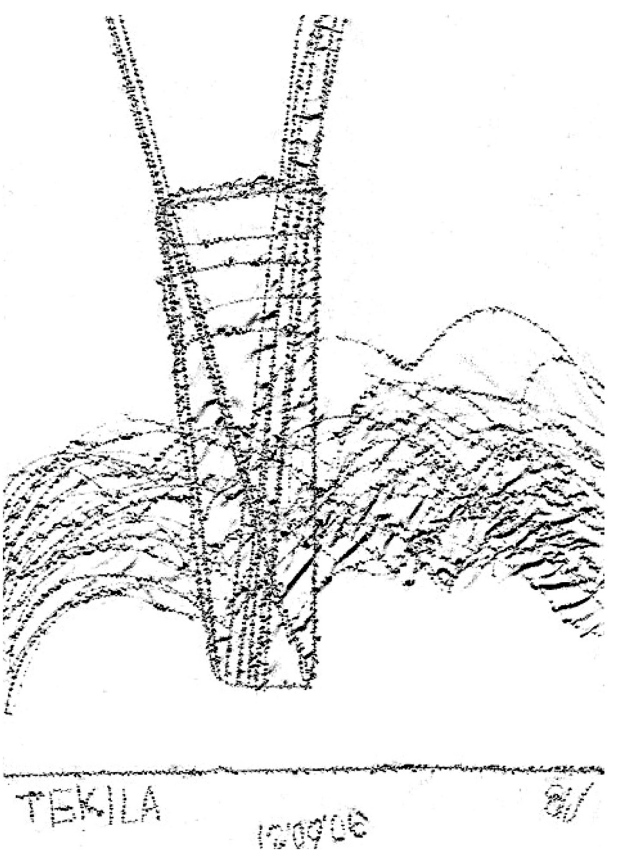

Figure 1. Glass of tequila. By EW.

The topic of figure 2 is a hot chili pepper (habanero). EW has written JABANERO at the bottom of the picture, and the date 10.09.06. There are many zigzag lines in the picture, and in particular the bottom third of the picture has two dense trails of closely spaced sharply pointed zigzags. "You feel like this after a while", EW said, "It is very intense. Really like hah-hah-hah". Saying hah-hah-hah she moved her hand up and down in time. She said: "It tasted like this". In the central area of the picture and slightly to the right is a drawing of a hot pepper. It has lines in the interior. "It has a strange shape, shriveled up", she commented.

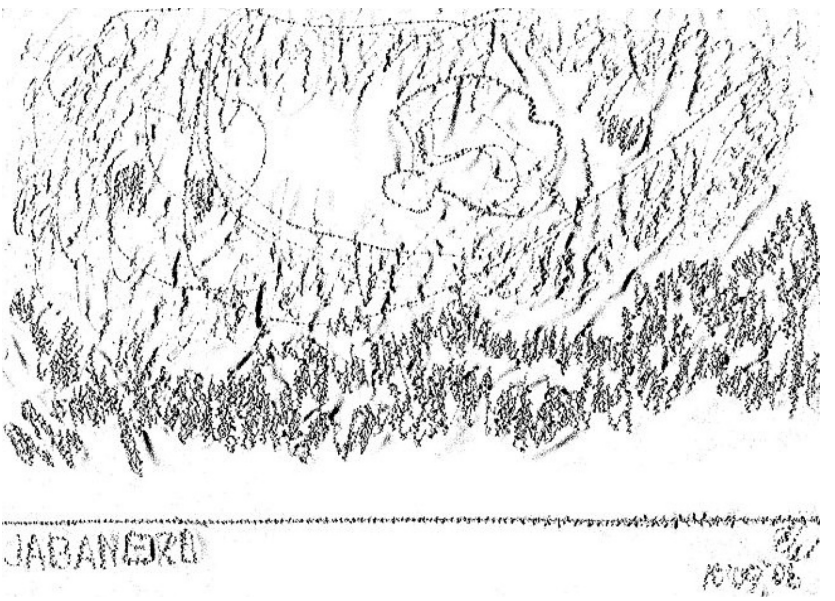

Figure 2. Habanero hot pepper. By EW.

The subject of figure 3 is a mariachi band. On the bottom, EW wrote MARIACHI and the date 07.09.06. Dense straight lines radiate from the bottom left. They depict the sounds of a trumpet. Swirling curved lines show the sounds of a violin, and zigzag or castellated shapes (such as a bottom right, lower line) those of a guitar. The guitar has a "more steady rhythm", EW said. She wrote (EW 2008): "The jotted lines on the lower half of the page represent the background guitar music, played in constant rhythm. The wavy lines meandering across the page mean the beautiful melodic harmony of the violin like flwoing (sic) singing voices." Lines on the bottom right resembling stakes oriented horizontally, one above the other, show tapping sounds. She described her drawing of the sounds as "personal ... I can draw the sounds and tell people" [what they show].

Figure 4 is a drawing of EW swimming. It shows her back view, with a V on her back to depict her swimming costume, and an arc for the costume's belt across her waist; EW has written ISLA DE LA MUJERES at the bottom, and dated it 07.09.06. Long trailing lines come from her fingers. These are said to show the feeling of the water running through her fingers. They show, she said, that you "push it down".

EW also drew many objects in profile, eg a pyramid she climbed, and a lizard.

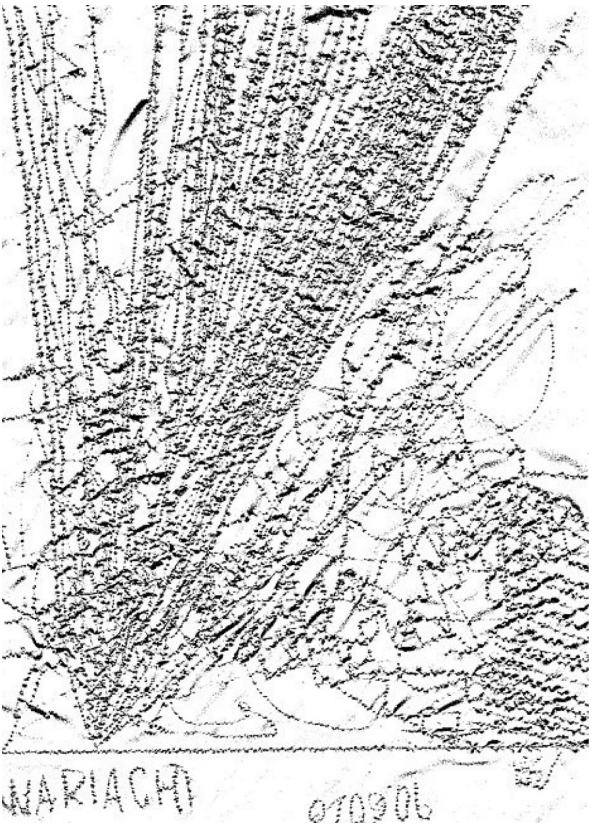

Figure 3. Mariachi band with a trumpet, guitar, and violin. By EW.

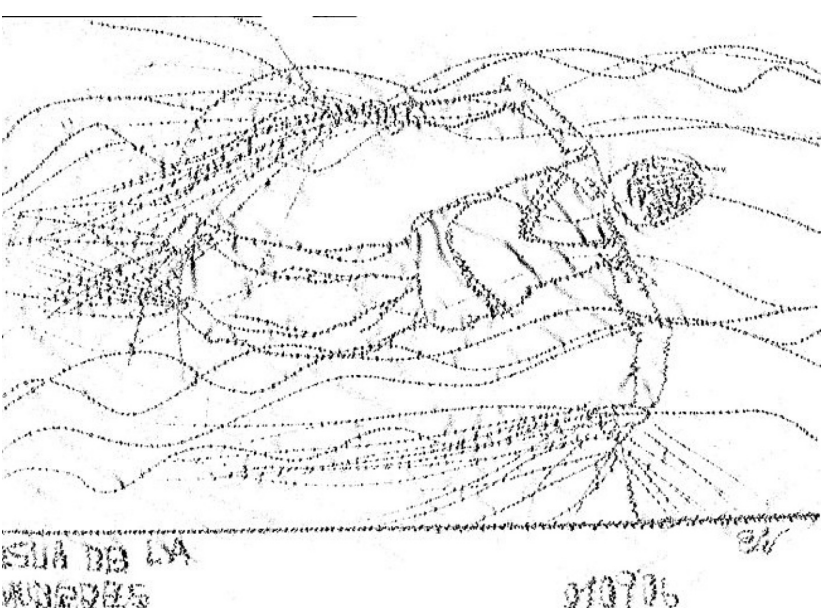

Figure 4. EW swimming off the Isla de la Mujeres. By EW.

4 Discussion

Some of EW's lines trace the shapes of tangible edges, but some have a very different character. Do both kinds have features relevant to each referent?

In figure 1, the glass and the straws are shown by lines standing for surface edges. The other lines are overlapping chains of curves. They represent an effect of tequila, a feeling. The curves are apt for suggesting the apparent swirling and unsteadiness that alcohol induces. If so, they are lines of motion—apparent motion in this case.

In the habanero picture (figure 2), the pepper is drawn in outline style. The surrounding zigzag lines have sharp ends, and form very rough contours. The sharpness and roughness are relevant to intense discomfort from hot peppers. The zigzag lines vary in intensity. So too do effects from hot peppers. The individual vertical lines of the zigzags are paired with panting breaths, in EW's explanation. This is the device on which EW commented: "It tasted like this", and showed she thinks well of it by saying she "feels comfortable with this", and it comes "naturally".

The mariachi band in figure 3 has no people or instruments shown in outline style. Every line depicts sound. The trumpet sounds are shown by dense straight lines radiating from a single bottom-left point source and stretching over the picture from bottom to top, covering all of the top edge of the picture. They run through the curved lines for the violin and the horizontal castellated lines and wide zigzag lines for the guitar. It may be that the intensity of the radiants coming from the point source aptly represents the intensity of a single nearby trumpet. EW said the musicians came right to your table at the restaurant in which she heard the band. The intense radiants could be described as piercing, cutting through the lengthy trails for the other instruments. They reach from bottom to top of the picture, and fill the top, which could be matched to the trumpet's volume filling the immediate environment. The guitar sounds are shown as castellated, in keeping with individual notes plucked one after another, with abrupt onsets. The swirls for the violin differ from the castellated lines. Their shape contrasts with the guitar's lines, since violin notes are played continuously before being replaced by the next in succession. The contrast in shapes is useful. It suggests two instruments, and two different ways the strings sound. Nevertheless, she described the lines for sound as more personal than the lines for the taste of the hot pepper, or objects in a scene, saying: "The sounds I can draw and tell people" [what the lines mean].

The swimmer (figure 4) is drawn in outline style, the body, limbs, and swimming costume depicted by lines standing for occluding boundaries. These depict tangible edges of streams, much like the water streaming from a tap has tangible surface edges. The stream from a tap has visible edges. The stream within a sea does not. An interesting interpretation is that these lines may appear metaphoric to the sighted, but they are literal for the blind. EW's e-mailed comments may paraphrase this interpretation, and add an aesthetic consideration: "People have some experience of moving their arms and hands through the water and feeling the sensation caused by those movements. So some people can perhaps edentify [sic] with those lines for the water going through the fingers while swimming. However, those lines for the water are more of tactile experience than visual, so those lines are perhaps not necessarily 'loyal' to what you might see while observing somebody swimming in the cave .... But those waves also represent yet deeper emotional experience of feeling free and sort of liberated, floating through the cave, a kind of feeling that makes you want to shout with joy. That is solely subjective. So those lines for the water show a range of experience ..." (EW, May 1, 2007).

While often far from depicting surface edges, lines in figure 1–3 share significant features with their referents. Likewise, in the metaphor "The jailor had a heart of stone" the topic literally mentioned (jailor) shares apt features with the metaphor's

vehicle (stone). Both the jailor and the stone are unyielding, one to pressure and the other to entreaty. The stone is in the wrong place literally, but it is in a useful place metaphorically because it shares common properties with the topic (jailor). So, too, metaphoric pictures have devices in the wrong place so far as surface edges are concerned, but offer apt common properties with their referent (tequila, pepper, and music). In figure 1 an apt property is the swirling, in figure 2, the discomfort, and in figure 3, the piercing through other lines.

So far as the choice of specific devices is concerned, EW's pictures are independent creations. Zollitsch (2007) wrote: "I never told her, how to do it, she always finds her personel [sic] solutions, how to draw...Most important is always ... the will to express yourself in your way". And "She started to draw at home and during traveling and I was always was very keen to see her new drawings". Zollitsch (2003) does not specify how to use outline in drawing, or what topics require novel use of line and form. She considers blind children to be "tuning into their own personal imagery" (Zollitsch 2003, page 159). As blind children draw for the first time they are "expressing themselves freely" (page 160). She finds "original, refreshing, precise, and authentic power in the blind children's images" (page 161). In Laouturi-Gritzala (2006, page 231), a letter from Zollitsch suggests about one blind child's picture that it reflects "in her own unique way how she perceives the world around her and how she translates her impressions in to [sic] her own original set of images".

Zollitsch has not directed attention to specific topics or uses of line. Her influence freed EW from strictures, and encouraged her to be creative. What is striking is that EW used lines and their forms aptly for tastes, sounds, and visceral reactions. EW describes Zollitsch as supporting her: "She encourages me to draw, to paint, to write, to create art, to put things I have got in me out in the form of art. When I need it, she makes herself available as assistance (when for example when I want a certain colour for my finger-painting and don't know which colour combination will make this image I have got in mind). She also gives feedback, mostly positive ones, about my work. For example, she tells me what she likes particularly about my certain work, or what is especially interesting or striking about it. Sometimes it is a certain line in my drawing, or a certain colour combination in my finger-painting, the use of space on the paper, or the impression the work suggests. She does not give much opinions as to how I can improve my drawing, or what she does not like about it. She has never told or taught me how to draw ... she gives no instructions ... it was my idea to draw tequila, javanero pepper, swimming in the cave etc.... I did some sketches of the things that struck me" (EW, April 30, 2007).

Metaphoric devices are of two kinds. EW's graphic devices such as the curving line for being tiddly do not specify objects. In contrast, cartoonists draw long noses to suggest a fibber, or tiny birds flying around a drunk's head. The shapes of the objects are drawn literally, but a secondary reference is intended. The present paper is about graphic devices. A similar study asking how blind people might spontaneously picture objects with metaphoric overtones would be useful.

EW's graphic devices use common properties rather than synaesthesia. In pure synaesthesia, a stimulus takes on the appearance of another, eg Ds printed in black might appear bright green. In contrast, the effects of EW's hot peppers are shown by lines of different thickness. Thicker and more closely packed lines stand for more intense taste. The taste itself is not apparent, just intensity. Also, the short vertical closely spaced lines are related to quick panting—hah-hah-hah—because both the lines and the pants are brief and close together, the one in time and the other in space. The wavy lines in EW's TEKILA share a shape property with tequila's effect—postural instability—but they do not cause us to feel unstable. Further, the waves are smooth,

and share a property with the emotional effect of tequila, but do not cause us to feel inebriated. A mariachi-band's trumpet notes are loud and pierce through other sounds, sharing common properties with salient straight lines drawn from one end of a drawing to another. The trumpet sounds come from one source, and dominate the scene, much as lines radiating from one corner fill the far side of the drawing. But they do not cause us to hear sounds. In the Isla picture, water streaming through a swimmer's hands provides long trailing threads of turbulent water. But they do not cause us to perceive the motion of a liquid. In sum, I suggest EW's devices are metaphors based on common properties shared by the graphic forms and their referents, and they do not cause us to see the defining qualia of their referents, the key to synaesthesia.

What general suggestions about cognition, perception, and aesthetics might be deduced from EW's pictures? Here are three. First, that metaphor surely belongs in all representational media, not just in words (Kennedy 2008). For example, by running slowly in place, a mime can represent a superhero running fast. Second, graphic-device metaphors may be apt for the same referents in tactile and visual pictures, because many aspects of form are both visual and tactile: curvature, straightness, density, grouping, depth, direction, texture, etc. Third, the same aesthetic criteria may apply to tactile and visual pictures: smoothness, jaggedness, flowing, balanced, etc.

In short, the evidence suggests EW devised metaphoric pictures on her own initiative. This case study supplements experimental studies that systematically control variables. It offers evidence that blind people can devise drawing problems that lend themselves to apt metaphoric devices they can invent.

Finally, remarkable words from EW may help demonstrate she has a general interest in selecting challenging original topics to represent, and this has lead to her devising metaphoric pictures. "My dream is to collect the images of winds from different corners of the world and put them together into a sort of book form."

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