Knowledge Generation in Technology-Enhanced Health Exhibitions

Using Eye-Tracking Methods to Understand Audience Knowledge Generation in Health Promotion Exhibitions

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Knowledge generation in technology-enhanced health exhibitions: Using Eye-tracking methods to understand audience knowledge generation in health promotion exhibitions

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Abstract:
This paper presents results from eye-tracking studies of audience interaction and knowledge generation in the technology-enhanced health promotion exhibition PULSE at a science centre in Copenhagen, Denmark. The main purpose of the study was to understand what types of knowledge audiences build in health promotion exhibitions designed to include direct physical interaction. The current study is part of the larger PULSE project, which aims to develop innovative health promotion activities that include a science museum exhibition as a key setting. The primary target group is families with children age 6–12. Health promotion technologies are defined here, as technologies designed specifically for the purpose of health promotion, be they educational or focused on physical activities. The study was conducted in late 2015 and comprised eight families with children in 2nd-6th grade visiting the science centre. Eye-tracking glasses and qualitative interviews were used to collect data. Before entering the PULSE exhibition, one adult in each family group and one child in each school group were asked to wear eye-tracking equipment while interacting with various installations. Primarily adult test persons were chosen because wearing the eye-tracking glasses seemed less of an intrusion for adult visitors than for children. The glasses recorded audio, video and gaze point from the test person's point of view. All members of each group were interviewed briefly following their interaction with the exhibition to understand how they had experienced the exhibition, what they saw as the thematic focus and if they thought they had gained new knowledge from the activities. Results from the project indicated that the participants gained knowledge linked to both health fitness topics and social aspects. Results also showed that the exhibition supported both themes related to discovering new types of physical activity and themes of collaboration and social family activity.

Keywords: Health exhibition, eye tracking, science museum, visitor studies.

1. Introduction

In this paper the central focus is to understand how science centres can potentially play a role in promoting audience knowledge and action competence for managing or changing wellbeing and health condition. In recent years non-communicable diseases (NCDs) have gained increasing attention in the international public health community based on evidence of overtaking infectious diseases as the main cause of death (WHO, 2005). The reasons for this increase in e.g. type 2 diabetes and related diseases are extremely complex and beyond the scope of this application. Some of the essential risk factors, however, are unhealthy eating practices and physical inactivity that lead to obesity. Among young people living in Europe the increasing prevalence of obesity is clear and the patterns of food intake and movement are well described (WHO Europe, 2008; WHO, 2009) – though large differences exist between various countries.

Information and communication technologies are generally viewed as new and promising tools for innovative reformation of health care systems (WHO, 2005). Information technology in health care receives extensive attention but less focus is placed on their use in health promotion. Several categories exist for what we define as health promotion technologies – technologies designed with the aim of supporting health promotion (Magnussen & Aagaard-Hansen, 2012): *exercise instructing technologies* specifically designed to instruct or facilitate specific forms of physical exercise such as dance and sports games; *didactic health promotion technologies* designed specifically for formal educational purposes such as web- or game-based educational portals where students solve quests related to health issues; *self-monitoring technologies* designed for monitoring of physical activity such as pedometers; and *network health promotion technologies* designed for facilitating social networking in relation to health promotion initiatives such as sports activities or patient wellness.

Play and learning technologies can potentially provide new tools for health promotion in informal learning environments offering new settings and types of participant control over health activities especially for young participant groups. It is therefore central to understand what new learning perspectives these technologies offer in informal learning settings such as science centres. The

current paper is based on studies of audience interaction with the health promotion exhibition PULSE at the Danish Experimentarium Science Centre, where health promotion technologies are closely integrated in all exhibition installations. Studying audience interaction in this setting leads to exploring the influence of health promotion technologies on knowledge generation. In this paper we thus explore what types of knowledge the audience expressed having gained after visiting the PULSE exhibition and how the exhibit design influenced this.

2. Background health exhibitions and tracking informal learning

This study focused on understanding potential learning perspectives in the science centre exhibitions context integrating health promotion technologies. In this context it is central to understand both the central aspects of learning in a museum context and competence development in relation to the broad and positive health promotion concept.

There are numerous studies on family learning in museum and science centre settings. Studies documenting parents and children communicating at science museums demonstrate how such spaces can introduce children to science as an academic discipline (Crowley & Jacobs, 2002). They also document how children build scientific expertise and other academic knowledge by visiting science museums and talking to their parents during and after their visit. Studies further indicate that families often have a social agenda and expect to have a positive social experience when visiting a science museum. Many parents consider the visit successful if their children acquire deeper insight into science and technology by playing games and engaging in a variety of activities (Falk & Dierking, 1992). The experience can be even more positive when parents feel that they also gained new knowledge. Parents are the key to creating social interaction in the family involving exhibition activities (Briseño-Garzon et al., 2007). Overall research results from various fields indicate that science museums have the potential to act as a learning setting where families develop knowledge on science and health issues by participating in health promotion activities.

Participation is a core element of democratic health promotion (Jensen, 2009). To create permanent change in behaviour actively involving the target group is necessary to create action competence along with a sense of personal ownership regarding change. Participation is closely linked to the notion of empowerment (Freire, 1972). A broad and positive concept of health includes wellbeing and quality of life, as well as the absence of disease (WHO, 1947). This concept acknowledges that health is influenced by behaviour and lifestyle as well as living conditions, which are often not addressed in health campaigns (Jensen, 2009). Health promotion research points to the importance of involving multiple settings and stakeholders in target group communities to promote sustainable health changes (Algazy et al., 2010). Settings are often defined by a combination of physical boundaries and/or organisational features.

Building competence for taking action and participating in changing health and wellbeing is central to modern health education (Jensen, 2000). Bruun Jensen argued that the concept of action competence is central for understanding how target groups take action to change their health and wellbeing. Action is here defined by something that “involves inner decision making” and external goals and “is deeper” than behavioural change. Actions involve conscious decision-making that, according to Bruun Jensen 2000, p.148, is different from the concept behavioural change:

> *Expressed briefly, an action as defined by the democratic paradigm has two key characteristics: it should be purposefully directed at solving a problem or facilitating change, and it should be consciously decided on by those carrying out the action. In other words, an action is targeted at change, which may be a change in one's own life-style, in the school, in the local society or in the global society, and an action is intentional.*

Bruun Jensen defined four dimensions of knowledge central for target groups’ building competence promotes action to change health and wellbeing (Figure 1): 1) Knowledge about *effects*, this is knowledge about ‘what’ effect is caused by the surrounding environment or a specific behaviour; 2) Knowledge about *causes*, knowledge about ‘why’ we have the health condition we have and what factors affect our health; 3) Knowledge about *strategies*, knowledge about ‘how’ we change a health condition and 4) Knowledge about alternatives and *visions*, knowledge about ‘where’ we can go to fulfil visions for the future life conditions (Jensen, 2000; 2009).

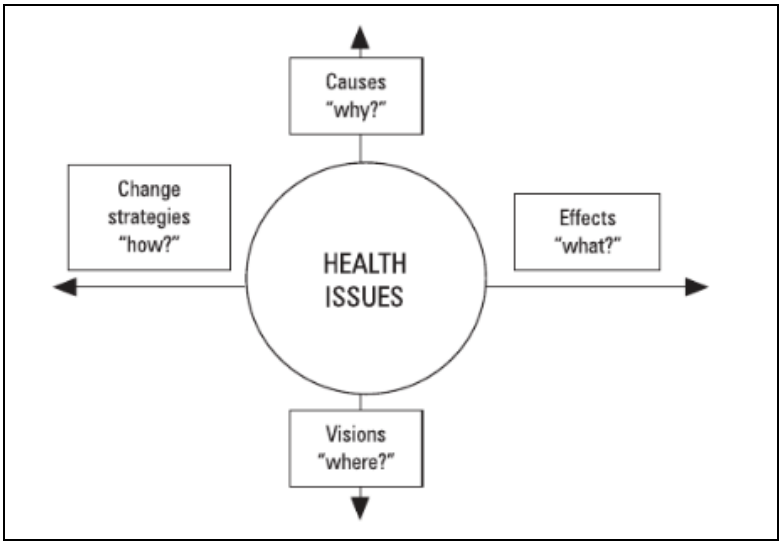

Figure 1. Four dimensions of health-related knowledge central to building action competence (Jensen, 2000).

The studies in the current paper are focused on understanding the types of knowledge the audience gained from visiting the health promotion PULSE exhibition. The target group for the exhibition was families with children aged 6-12 years old. The PULSE exhibition had gone through iterations of research-based development with focus on building principles of the broad and positive health concept into the exhibition. The aim was to utilise the science centre as an informal learning space for supporting knowledge generation related to building action competencies. This is further described below.

3. The PULSE exhibition and data collection methods

The studies resulting from the current paper are part of the larger PULSE project running from January 2013 to December 2016. PULSE project's vision is to create innovative science exhibitions and activities in local settings in Copenhagen to motivate and supports families taking steps to develop and maintain a healthy lifestyle. PULSE project focuses on research and development in several settings. There have thus been development and research activities both at the science centre exhibition and in other local and digital settings. The current paper presents the results from studies in the Experimentarium exhibition space with focus on understanding what knowledge families and school classes with children aged 6-12 perceived to gain from interacting with the PULSE exhibition and how this was influenced by different installations.

The exhibition went through several iterations of research-based development, intervention analysis and redesign. The methodology used in the development of health promotion components of PULSE followed a design-based research (DBR) process and involved various cycles, interventions, analyses and redesign (Brown, 1992). In design-based research the focus is on developing learning environments along with domain specific theories (Cobb et al., 2003). The method serves as a framework for integrating differing approaches at the various stages of research and development (Squire, 2005). Theoretically the PULSE development process presented a broad and positive concept of health including wellbeing and quality of life (WHO, 1947) along with theories of democratic health promotion (Jensen, 2009), ownership, participation and empowerment (Freire, 1972). In the first phase, representatives from the primary target group – the so-called PULSE families – were invited to participate in the co-design of the first exhibition concept with developers and researchers in the project (Sandholdt & Ulriksen, 2016). The exhibition prototypes were developed based on co-design results and PULSE families' interventions. The theme of the exhibition is a slightly twisted version of a home setting. Each family receives radio-frequency identification armbands at the entrance to the science centre and logs in as a family group to interact with the PULSE exhibition installations. This strengthens the family experience central to the target group. Installations include a gamified kitchen where families gain points for climbing on the walls and furniture and loose points for touching the floor. Other installations include a bathroom where participants dance with a virtual cleaning lady, a hallway where participants climb as fast as possible under strings and over messes left on the floor and a living room where participants try to knock team members of a rodeo-like easy chair, pulling on attached ropes.

In the second DBR iteration the authors of this paper studied how the audience perceived knowledge gain from the PULSE exhibition with focus on understanding knowledge generation in health promotion exhibitions to explore potential re-designs in the exhibition that will strengthen audience learning.

3.1 Data collection and categorisation methods

The study of perceived audience knowledge generation was conducted with eye-tracking methods supplemented by interviews. Studies were primarily done on weekend days where visitors at the Experimentarium were primarily families and also during weekdays where the audience primarily consisted of school classes and their teachers. The study was conducted with 8 family groups and 2 school groups of 2-5 members. The respondents were chosen from the visiting audience based on their match to the target group of the project; families with children age 6-12 years old. The groups were invited to participate in the eye-tracking study before their first visit to the exhibition. After the eye-tracking interaction in the PULSE exhibition group members participated in short un-structured group interviews (Kvale, 1996) with questions about the perceived theme of the exhibition and the perceived knowledge gain from interacting with the installations. Interview data was categorised in a grounded theory process (Strauss & Corbin, 1990) and two main themes were generated. The themes will be described in the findings section along with results of eye-tracking findings.

3.1.1 Eye-tracking methods

In the eye-tracking study one adult in each family group and one child in each school group was invited to wear eye-tracking equipment. The use of eye tracking in this context relies on the idea that human physiological capacity to obtain, or sample, visual information from the surrounding environment is inherently limited by the structure of human eyes, which can only receive high acuity visual information from a very narrow visual angle at any given point (Land, 2014). Perceptual processing capacity is also inherently limited, and consequently, there is a high correspondence between the locus of overt attention and the direction of the gaze. Thus, by tracking where a person is looking on a moment-to-moment basis provides rich information about what information is being sampled and used in visually guiding the activities people are engaged in, and in situated learning and social communication processes (Lauwereyns, 2012). In this study, we implemented eye tracking using a mobile glasses eye tracker (SMI ETG 2w 60hz, SensoMotoric Instruments GMBH, Teltow, Germany). Mobile eye tracking uses non-invasive recording technology that relies on illuminating the eye with a safe-intensity infrared lamps and tracking the position of thei reflections in the moving eye using an infrared camera. SMI ETG 2w system is built into sports glasses (about the size and weight of skiing glasses) and uses a smartphone with custom software to record data. The system is worn by a participant in the same way as sports glasses are worn and the data recorder is worn in a small belt pouch. Thus, this system provides high mobility and allows the participant to move freely and interact with the surroundings in a nearly unrestricted way (apart from the slight limitation of peripheral vision by the frame of the glasses and the limited conscious effort on part of the participant to avoid damaging the equipment). The output data is a gaze overlay video, that is, a 1280x960 pix 24 fps color video recording of the subject's point of view (the camera is positioned approximately between the eyebrows) with the position of the gaze marked by a marker in each frame. Gaze position is estimated by the eye tracker firmware from a 60hz recording of the eye position matched to the position of the gaze within the recorded field of view. Gaze overlay video also contains an audio track recorded via a microphone mounted in the glasses, thus recording what the participant is saying and some surrounding sounds (e.g., what another person standing close says in a conversation). Recordings using eye tracking began with explaining the equipment to the participant, fitting and calibrating the eye tracker, and starting the recording, after which the participant moved freely around the exhibition until they decided to stop their participation (on average, after about 40 minutes, the time needed to go through most attractions in PULS exhibition). Data was qualitatively analysed by reviewing the gaze overlay videos and matching the locus of overt visual attention with the participants' utterances, following procedures described in Holmqvist et al. (2011).

4. Findings

The presented study of the PULSE audience experience of knowledge generation is described based on both interview and eye-tracking data from audience activity in the exhibition. However, the study of health promotion knowledge generation in the PULS exhibition was also informed by results from evaluations of the PULSE exhibition. In the evaluation survey 81 visiting families answered questions about their opinion of, and satisfaction with, the experience at Experimentarium. 39 of these families stated they had visited the PULSE exhibition and proceeded to answer questions about their experience and satisfaction specifically about the PULSE exhibition (Zachariassen & Magnussen, 2016). These evaluations were made as part of the larger PULSE project. Survey results from evaluations of audience experience of PULSE as a learning experience revealed that a majority of the families visiting PULSE view the exhibition as "Somewhat" (43%) or "Very much" (34%) whereas only 2.3% answered "Not at all" in learning experience (Figure 2).

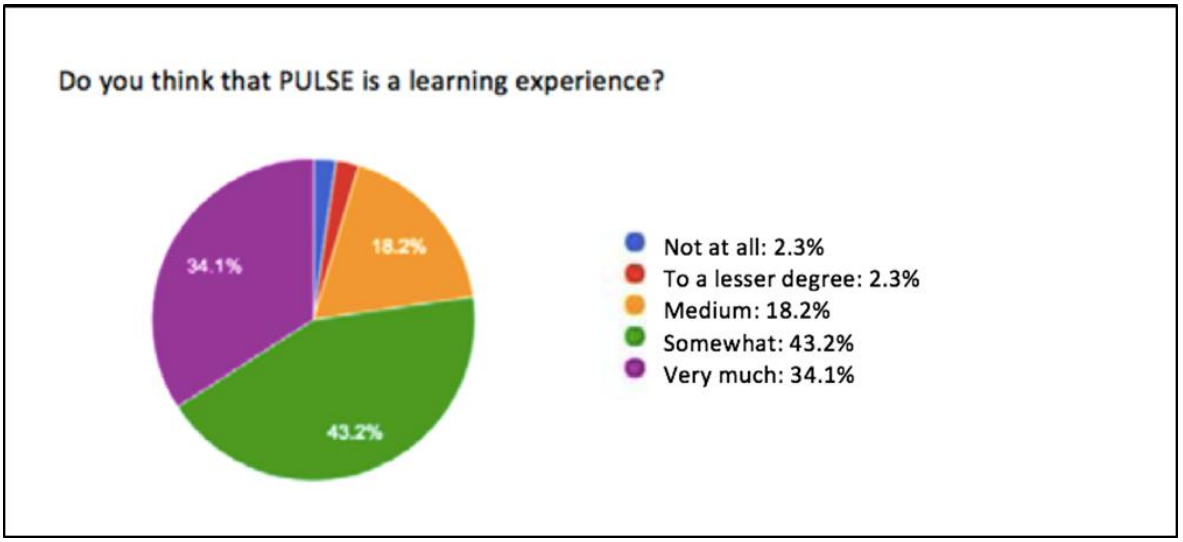

Figure 2. Survey results from 39 families after visiting the PULSE exhibition (Zachariassen & Magnussen, 2016).

The evaluation further investigated the audience experience of learning from interacting with the exhibition (Figure 3). In this survey the audience was allowed multiple answers and the majority of the audience "Felt challenged" (97%), "Gained new knowledge about physical activity" (52.9%) and "Was inspired to be more physically active" (44.1%), whereas only 32.4% of the audience answered "Gained new knowledge about health."

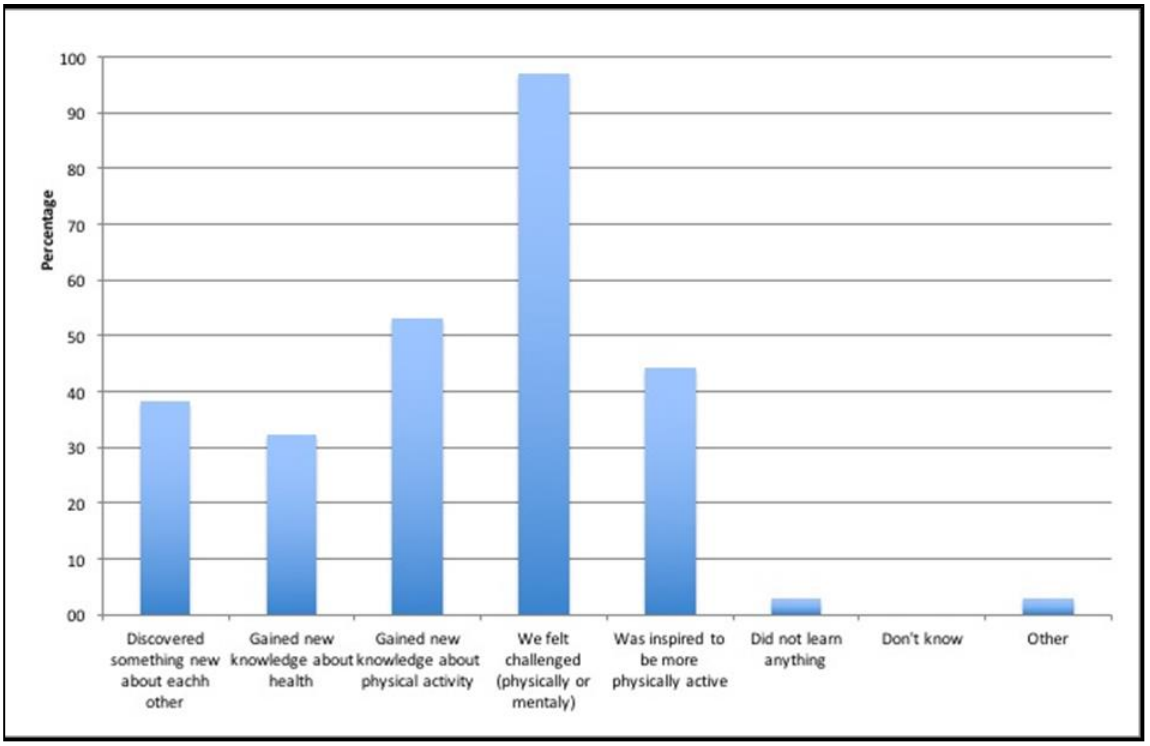

Figure 3. Answers from PULSE audience to the question "In what way/how is PULSE a learning experience? Only presented to people who answered positively to the question on whether PULSE is a learning experience. Multiple answers were possible for respondents: Discovered something new about each other/myself 38.2%; Gained new knowledge about health 32.4%; Gained new knowledge about physical activity 52.9%; We felt challenged (physically or mentally) 97.1%; Was inspired to be more

physically active 44.1%; Did not learn anything 2.9%; Don't know 0.0%; Other: 2.9% (Zachariassen & Magnussen, 2016).

This study thus encouraged further investigation of the types of knowledge the audience expressed gaining and what in the exhibit may have influenced this building of different types of knowledge. During the grounded analysis of data from the interviews conducted with eight families and two school groups after their first visit to the PULSE exhibition we identified the following categories:

1. Movement / exercise
2. Experiencing what one's body can do / Doing something physical you did not believe you could
3. Health
4. Collaboration
5. Family & community

The categories were grouped into two overall themes: 1) Movement and the experience of new types of physical activity and 2) Family, community and collaboration. Next these various themes will be described.

4.1 Themes: Movement, experiencing new types of physical activity

After their first visit to the exhibition some of the families said that the theme of the exhibition was movement and exercise. The interview respondents explained how they specifically experienced new knowledge gain about their body and physical potential such as knowledge about "how high you can jump," "how fast you are," knowledge about being unfit, "exercise and your heart rate" and "new knowledge about how to do things", such as jumping higher and dancing. Responses also included answers such as knowledge about "energy consumption" but the majority of the families' responses were related to gaining knowledge about their bodies. This type of knowledge was particularly mentioned in relation to installations such as "the kitchen" where you had to be fast to press light switches, the "jump over fence" installation where the challenge was to jump as high as possible and the Bike Shed, where the challenge was to race family members. An example of the latter was a description by a 6-7-year-old girl in the interview with one of the test families:

> *Interviewer: If everyone had to try to explain what this exhibition is about what do you then think it's about?*
> *Girl: I think it's about technology and what you're like inside your body.*
> *Interviewer: How you are inside your body?*
> *Girl: Yes, you find out what you are like inside.*
> *Interviewer: Can you try to explain it?*
> *Girl: Well, for example, what you can do that you weren't aware of, like that thing with cycling and heart rate for a minute and things like that.*
> (Interview with Family A after first visit to PULSE exhibition)

In the citation above the girl from Family A referred to an installation in the exhibition where the family cycles together on exercise bikes. Sensors in the bicycle handlebar measure heart rate on four bikes located next to each other. In front of the bike is a large screen where a movie simulates a family bike ride to the beach. Participants receive instructions first to cycle and then to rest to see how fast their heartrate decreases to a resting rate. Information about who takes the lead in the bike ride and the different member's heartrates is also given on the screen. In the eye-tracking studies of Family A focus was on understanding what in this installation influenced building knowledge about "how you are inside yourself" and "what you can do, that you weren't aware of". Family A had three members: a father and two girls 6-7 years old and 9-10 years old. The family first approached the cycle installation while another family was using it. In Figure 4 and the first citation, the father wearing the eye-tracking glasses and Family A are watching another family using the bikes:

Figure 4. Screen shot from eye-tracking studies of Family A. The father in Family A (wearing eye-tracking glasses) is watching another family using the Bike Shed while he and his daughters are waiting to try it. The text on the screen says "Bike Shed", shows biking time (0:20) and "Feel your body and see your PULSE fall". The digits represent the different family members' (different colours) heart rate per minute. The boxes also indicate who takes the lead in the virtual bike race.

> *Dad (with glasses): It looks fun (Bike Shed)*
> *(Watches family before them)*
> *Dad (with glasses): Should we try this one girls, or should we try something else?*
> *Youngest girl: I'd like to!*
> *Dad (with glasses): (still watching other family) See it's the pulse, it shows the pulse of how many times your heart beats in a minute. See, his heart beats 167 times a minute.*
> *(…)(Family gets on the bikes)*
> *Youngest girl: when shall we start?*
> *Dad (with glasses): It reads the pulse. See, it reads our pulse*
> *Dad (with glasses): Great you're in the lead. Where are the others? It says you have more power. It says give it all you've got! Come on! Yes!*
> *[00: 15: 34.08] Dad (with glasses): See it's our pulse.*
> *(…) (Interview right after Family A tried the Bike Shed)*
> *Youngest girl: I'm sweating!*
> *Interviewer: I can see why.*
> *Dad: There's nothing intellectual about it. It was very physical.*
> *Girl: Try to feel how much I am sweating!*
> *Interviewer: (laughs)*
> *Dad: Yes, it's wonderful (laughs).*
> (Transcript, eye-tracking studies of Family A testing the Bike Shed installation in the PULSE exhibition).

In the above situation the girl and the family received different types of information in testing the installation. Before trying the bikes they first received information about how to use the installation from watching another family. The father however also used one of the family members as an example for explaining what is measured, "his heart beats 167 times per minute." The bike interaction between the father and the girls was focused on his physically challenging the girls and encouraging them to bike faster. This was possibly what the girl referred to later when she expressed that she gained new knowledge about "what you can do, that you weren't aware of." After the activity the girl expressed that she was sweaty referring to what could be called embodied information she also mentioned new knowledge of finding "out how you are inside yourself."

4.2 Themes: The family, collaboration and community

Another major theme in the interview with the families was the family experience, collaboration and

family community. This included knowledge about “being together as a family,” “doing something with the family that you haven’t tried before” and “doing something different from at home but in a way the same.” This knowledge was specifically mentioned in relation to the installations “the kitchen” and the “ball court,” where families collaborate to get as many points as possible by climbing around on the kitchen furniture without touching the floor and switching off light switches and dropping balls in holes on a court. Another mentioned installation was “the bath” where families danced together following a virtual instructor on a screen in a bathroom setting (Figure 5). An example of the latter was a description made by the mother in Family B following their interaction with the installation:

> *Mother Family B: I think it's fine for a family to do something together. I think they were good activities and everybody could participate because with the others over there (points to installations outside the PULSE exhibition), they say “I can’t work it out” and then give up, but here it was fun for everybody, I think.*
> *Interviewer: The youngest you mean?*
> *Mother and father: Yes.*
> *Interviewer: What do you think this exhibition is all about?*
> *Mother: It's learning how to exercise in a fun way. Well, I think… so you can exercise in other ways than just running. Here you can also get your heartrate up cleaning the bathroom or anything by doing it together. You don’t have to go to the gym. You can do anything together to get exercise and things like that. (Transcript from Interview Family B after first visit to PULSE exhibition)*

As described “The Bath” is a room based on features from exercise dance games where players get scores for copying a virtual character’s movements. In the installation the members of the group dance in front of a virtual cleaning lady and gain points for how closely the members’ movements reassemble the virtual character’s movements or the percentage of “cleaning” that they do. In the eye-tracking studies of Family B focus was on understanding how the mother influenced the mentioned themes of collaboration, community and family. The family consisted of two adults, a mother and father, a younger boy and an older boy. In the below citation and in Figure 5 the father is wearing eye-tracking glasses and the family is getting ready for dancing in the installation in front of the screen with the virtual cleaning lady.

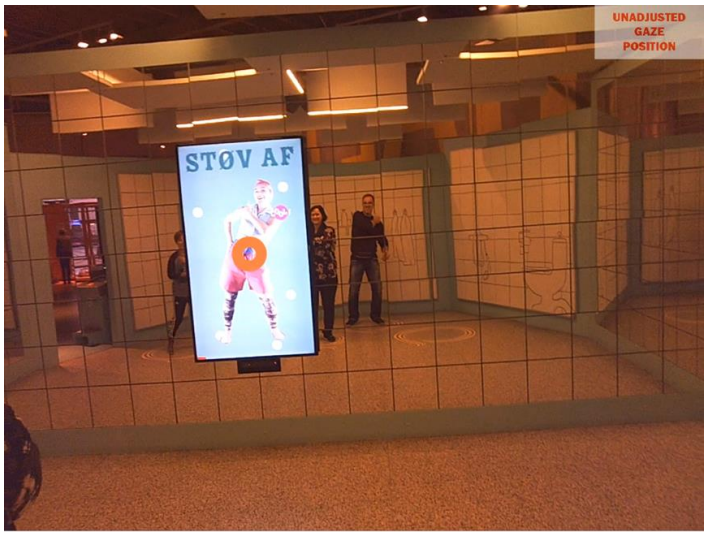

Figure 5. Family B dancing in the bathroom installation. The text on the screen: “Dust off” (Støv af).

> *Dad (with glasses): Go to a round one (marks on the floor).*
> *Bigger boy: Ooh noo!*
> *Dad (with glasses): I’ll stand over there in the back and hide. What to do? What should we do?*
> *Dad (with glasses): Okay, so we have to agree on what … (laughs).*
> *Mom: (reads aloud) You’re not standing on the marks.*
> *Dad (with glasses): (laughs)*
> *Mom: (laughs)*
> *Mom: (reads aloud) Whoops, some of you aren’t dancing (laughs. Looks at dad).*
> *Dad (with glasses): What? (laughs)*
> *Dad (with glasses): Oh my god (laughs), there sure isn’t any rhythm here (laughs).*
> *Bigger boy: 77 points!*
> *Mom: 77% clean. It was dad (looks back at father, laughs).*
> *Dad (with glasses): Was I the one who didn’t bother to clean or what? (laughs)*

As in the situation with Family A in the Bike Shed, Family B received information about how to perform the movements and interactions in the installation. The dialog and the citation from the interview with Family B however indicated that the knowledge and information discussed in the interaction in this installation is different from the information in the cycling installation. This is partly due to the way the interaction is valued. The score in the bathroom dance installation is given based on how well the family members do collaboratively. This resulted in discussions on collaboration both in relation to all members standing on the marks for the game to operate and by the father who claimed that the score is low because he did not bother to "clean" or did not dance as well as the other family members. Interacting with the installation participants thus did not receive information about their body or "how you are inside the body" such as heartrate and pulse as expressed by the girl in Family A, instead, the focus was on the social aspects of movement in the group which were also reflected in the dialog on collaboration for success. This is also expressed in the interview with the family where the mother pointed out that they gained knowledge about doing physical activities together.

5. Discussion and conclusions: finding various types of knowledge

The two main themes presented here, "Experiencing new types of movement" and "Family, community and collaboration" clearly depict how the various families experience the theme of the health promotion exhibition PULSE differently and how the assorted installations and actions facilitated by the embedded health promotion technologies influence their experience. The main focus of this study was to understand the types of knowledge the audience felt they gained from interacting with a health promotion exhibition like PULSE. We applied the perspective of the four dimensions of health-related knowledge central to building action competences (Jensen, 2000, 2009) in order to analyse our findings and came to the conclusion that not all these dimensions are represented in the PULSE exhibition.

With regard to the bike installation, the girl interviewed in Family A said that provided her with knowledge about "what you are like inside" and "what you can do that you weren't aware of". In the dialog with the father, he encourages her to do better in the bike race and she talks about how the cycling has an effect on her body, for instance by making her sweat. This experience is covered by the first dimension, which concerns knowledge about effects, in this case the bodily effects the surrounding environment causes that the respondents in Family A mention. An analysis of how the bike installation supports this understanding shows that the interaction between the bike, the screen and the people biking is focused on providing the audience with technical data about their heart rate challenging them to race against each other. This represents a self-monitoring technology that provides feedback on the individual performance compared to other competitors (Magnussen & Aagaard-Hansen, 2012).

Contrary to Family A, Family B primarily experiences the PULSE exhibition as a social event where the family can learn new types of exercises to do together. The mother talks about how the exhibition activities taught them about how to do alternative physical activities compared to what they usually do. This experience falls into the fourth dimension of health-related knowledge, i.e. knowledge about alternatives and visions. The family's interaction with the bathroom installation required collaboration to gain a reward and, in contrast to the bike installation, participants received information on how well they performed the activity together and not individual feedback on bodily responses. The bathroom installation with dancing is an example of an exercise instructing technology specifically designed to teach or facilitate specific forms of physical exercise (Magnussen & Aagaard-Hansen, 2012).

When the test families were interviewed only the two overall themes discussed here were apparent, which indicates that future studies must consider if and how it would be possible to create a design that incorporates the two remaining knowledge dimensions: knowledge about causes, knowledge about 'why' we have the health condition we have and what factors affect our health; and knowledge about strategies, knowledge about 'how' we change a health condition (Bruun Jensen, 2000; 2005). Two examples of possible health promotion technologies that can be used are didactic health promotion technologies, which are designed for formal education in health issues, and network health promotion technologies, whose design facilitates social networking in relation to health promotion initiatives. These two technologies can potentially provide platforms for reflection and action in relation to the causes of health issues and strategies for improving wellbeing.

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