

FLO)(PS : BETWEEN HABITUAL AND EXPLORATIVE GESTURES

Karmen Franinovic

The perceived affordances of an everyday object guide its user toward habitual movements and experiences. Physical actions that are not immediately associated with established body techniques often remain neglected. Can sound activate those interactions that remain latent in the physicality of an interface? This paper presents the Flo)(ps project, an ecology of interactive cups that aim to engage strangers in non-verbal communication.



Fig 1. Girls drinking lemonade and playing with Flo)(ps. Photo by Annie Tremblay. Courtesy of OBORO.



Fig 2. The Flo)(ps glasses are active only when filled with liquid. Photo by Karmen Franinovic.

Introduction

What we know how to do strongly affects what we do, what we perceive and what we are willing to do. Given a glass and a pitcher filled with water, we will most likely pour the water into the glass, although its shape suggests many other movements, such as rolling and throwing the object. The latter actions, however, are neglected because we do not associate them with glass as a functional object. Abandoning such functionality in the name of exploration and play can foster existing and new types of social interaction.

The unusual sonic objects within public setting can attract and engage the user in an explorative discovery of its potential for action. [2, 3] But what happens when an everyday object is augmented with sonic gesture? In the musicBottles project, for example, the user can play music by removing the cork from the bottle, having the impression of freeing a song from the object. [5] Using the bottle as a sound container, the user expression is limited to acting with its cork as an on-off switch. A more explorative sonic interaction with an everyday object can be found in the Audio Shaker project where sounds can be mixed by interacting with an ordinary cocktail shaker. [4] Users can speak into the object to record sounds, close and shake it to re-mix them and then literally, pour out the sound mix. The object challenges users' preconceptions about the purpose of a cocktail shaker through an unusual feedback. While the continuity of Audio Shaker's responses allows for a more explorative interaction than the discrete feedback of the musicBottles, both interfaces engage habitual actions: opening a bottle or pouring sound. But how can an everyday object guide the user toward the space of unusual and explorative gestures?

The coupling between action, sound and object seems to play a key role. The material aspects of an interface, such as its shape, weight or texture, afford an energy transfer between the body and the interface. When interaction is designed around such physical qualities and without reference to another known object, the user has to discover how to generate sounds. Such process of learning is enabled by coupling action to sonic feedback in unusual as well as in expected ways. [6] Whereas the former fosters discovery, the individual repertoires of expected couplings are defined through shared, culturally encoded movements and shaped by specific personal skills, such as knowing how to skate or to play an instrument. My argument is that this existing bodily knowledge may serve as a starting point for unusual and novel embodied experience.

Flop)(s interactive glasses

The Flo)(ps are project explores habitual and explorative sound gestures with everyday objects, and their impact on social and personal interaction. It is a set of glasses that sonically respond to habitual actions such as cheering and drinking, but are also activate when certain unusual gestures are performed. Different glasses can establish connection among each other if synchronously moved in a similar manner. Their connectedness is manifested through sonic and light responses which signal to the users that they are affecting their behavior. The goal of such performative connectedness among glasses is to make strangers communicate with each other, through an everyday object, in an embodied, dance-like way.

ACTION-SOUND COUPLINGS

The design of action-sound couplings took place through bodystorming where sonic gestures were explored using different objects and materials. Individual use of the object and the interaction between two people such as throwing the sound toward someone were probed. This helped decide how to map selected habitual and non-habitual gestures to different sounds. The habitual gestures extracted from sensor data included filling the glass with liquid, raising the glass, stirring the liquid, drinking and toasting, while the unusual gestures comprised twirling, moving the glass very slowly and shaking the glass. Habitual gestures generated sound of liquids such as pouring, while unusual movements opened up unexpected sonic spaces such as the sound of the storm. The movement of the glass continuously changed the qualities of the sound in order to give the user the feeling of an ecologically natural experience - in

the sense of cause and effect logic found in physical phenomena. [7] For example, tilting the glass would make some virtual water come out and then stop until the user inclined the glass more in order to pour out the remaining water.

EXPERIENCE DESIGN

The glasses respond to the user only when they are full, and otherwise sit quietly waiting to be filled with the liquid. Once filled, the glasses begin to pulsate luminously and emanate the sound of water drops, each in its own rhythm: faster and irregular, slow and in patterns or slow and regular. Different responses aim to communicate specific identity of each glass - one is energetic and nervous, one is slow and relax, one is determined and clear. Their behavior is intended to attract the visitors: as they approach the glass the volume of the sound increases, and once the glass is grasped the dripping fades out. The habitual actions, which are expected to be firstly performed, activate sounds of liquid. Starting from existing action-sound repertoires, the user is guided into new movement spaces. For example, twirling the glass activates the sound of the wind. The wind sound grows louder and more complex if the user continues to twirl the glass.

When the movement is synchronous, same light and sound patterns are displayed in both glasses. The aim of using the light feedback is to establish visual link when users are too far apart from each other. The connective sound responses become stronger as the users move in the domain of non-habitual movements with the glass. In this way, the users may influence each other's movements through the sonic and light response of the glass. The goal of connected behavior of The Flo)(ps is to allow the users to collectively perform and "to dance" with each other stimulated by the sonic response to their gestures. [1]

EVALUATION

Considering that the main goal of the project is to connect strangers through performative acts with everyday objects, the evaluation aimed to reveal the social potential of the system and to gain understanding into individual experience of using the Flo)(ps within public setting. The artifacts were exhibited at the Oboro center in Montreal, Canada over three-week period at the International Design Biennale, St. Etienne, France over four-week period. In the Oboro exhibition the users could drink beverages from the Flo)(ps, whereas this was not possible at St. Etienne Biennale due to the large number of approximately 85.000 visitors. In Oboro installation, each of the three glasses was associated with an area of the bar below which the speaker was located. Chairs were used to keep the visitor's interaction bounded to that designated bar area. The drinks were served in the late afternoon and evening of each weekend, at the exhibition opening, events such as Journees de la Culture and special organized visits that lasted from two to five hours.

The range of social experiences that emerge within public context in large part cannot be predicted. [3] Thus rather than focusing on a specific task which could be quantitatively measured, we preferred to qualitatively evaluate user's interaction with the system without any previous instructions. We used questionnaires and direct observation including participant observation, design-adopted video ethnography and the informal interviews. These methods were applied sequentially in order to avoid guiding user experience through questions. Firstly, the visitors interactions were video recorded; then participatory observation combined with informal interviews took place; and finally, the questionnaires were

provided after the groups of visitors finished interacting. The data collected included more than six hours of video recordings, seventeen filled questionnaires and notes from the participatory observation and interviews with participants during the installation. [1]

SOCIAL INTERACTION

The average interaction with the glasses took fifteen minutes, although many visitors spend more time within the installation while chatting with friends and drinking from the Flo)(ps. Overall, the findings about the social dynamics emerging around the objects proved to be best defined from the analysis of the video material and the insights gained through informal interviews. A number of patterns were seen to emerge including:

- **Mirroring and Synchronizing:** Participants were observed to mirror each other's movements, especially when someone discovered a new sonic behavior, as if learning from each other.
- **Non-verbal Communication:** One visitor wrote: "you don't have to talk to connect with strangers since you are already linked by the sound you are making and also the gestures" and another visitor described sound as "an extension of body language";
- **Collaborative Performance** was observed, as groups of three participants aimed to collaboratively compose sounds. This often led them to ignore the sonic and light connections as they focused on musical improvisation;
- **Simple Play** such as creating sound of clinging glasses by toasting was repeatedly performed. Participants appeared to enjoy the simplicity and predictability of the direct feedback, but this sometimes appeared to limit further exploration of interactivity;
- **Curiosity and Discussion:** Participants proposed different interpretations of the objects and explanations for their use such as glass as a seduction tool or a waiter's help;
- **Ambient Display:** During the performance with the objects, participants would stop to talk to someone while enjoying their drinks. The glasses would fade into the background until the user's attention was drawn back to their responses and play was resumed.

These observations show that the installation forged interaction between strangers, through sonic and light gestures. The light appeared to have a stronger connection effect than the sound which often appeared to be too complex to interpret. The use of light rhythmically varying in color and luminosity had an important role in establishing contact and was necessary when the overall soundscape grew louder.

Some visitors expressed desire for simpler and clearer sound responses. The clarity of interaction may be improved by reducing the number of gestures and by using simple motions, rhythmical patterns or large movements that showed to be preferred by the participants due to their clarity. However, prudence is required as reducing the temporal evolution of sonic feedback to direct responses may lead to on-off behavior that could quickly bore the user. In fact, those participants who had interacted alone desired more complex sonic behaviors. Thus, one solution to be tested is to apply simple responses when more people are using the glasses and more complex ones when a solo interaction takes place.

INDIVIDUAL INTERACTION

The subjective aspects of the experience were best described within the questionnaires and in participants reflections collected during the informal interviews. The following behaviors emerged:

- Expressive Solo Performance: Most visitors experienced the object as an expressive instrument. When they interacted alone, the rhythm of the performance often slowed down as they more carefully explored the sonic behavior of the object;
- Exploring the Unusual: Participants found it difficult to interpret unusual sounds, but were satisfied that the sound continuously responded to their gestures. One visitor wrote: “swirling it in a slightly less habitual and functional manner, it opens up an unusual sonic space. The splashing sound seems to gain in resonance. Soon after a deep howling, evocative of a storm, becomes amplified;” [1]
- Limited by Habits: Few participants stated that certain assumptions about what should be done with the glass affected their experience. One participant wrote: “I was more focused on solitary interaction. I guess I assumed that all that could be done with the glasses could be done alone.”. Participants enjoyed small deviations from habitual events, such as toasting with glasses of different materials (i.e. plastic glass with the sound of crystal one);
- More Dynamics: Because the sounds did not evolve if only habitual gestures were performed, some visitors who played for a short time period said that the sounds should evolve or change more often;
- Introspection and Intimacy: Many visitors who were alone in the installation used the glass as a kind of meditation tool. They were observed to stare at the drink being illuminated by the light or to slowly twirl the glass while listening to the sound of the rain or the wind. One visitor wrote: “They remind me of candles. It would be cool if they reacted to the stress in your palms.”;
- Strangeness: Several comments suggested that the sounds confer the sense of strangeness. Participants associated sounds to “an imaginary chemistry lab”, “stalagmite space”, “a damp basement” and “outer space”. Others, however, linked them to personal memories such as “playing in bath as a kid” or “it makes me feel like I am underwater”.
- Fun or Function: The presence of liquid in the glasses showed to be highly significant in affecting and constraining the way in which users interact with the Flo)(ps glasses, and the ways in which they perceive them. If the glass was activated when no liquid was in it, it was interpreted as a musical instrument, a toy or a magical device.

When performing individually, the participants were more attentive to sensuous responses of the system. They explored more deeply the transitions between habitual and unusual gestures while forming new interpretations for sonic and luminous behaviors of the glass. The distribution of the attention of the user appeared to be central to shifting between different types of interaction. Although the user interaction cannot be predicted, the spaces in-between the solitary and collective performance and between habitual and unusual gestures need to be well choreographed.

Conclusion

I have described the design and the qualitative evaluation of the Flo)(ps project that aimed to stimulate connectedness among strangers through sonic movement. The goal was to explore the space in-between the habitual and unusual sonic gestures with an everyday object. Using a familiar object such as a cocktail glass showed to facilitate the first exposure to its interactivity, but it showed to limit the exploration of its behavior due to the assumptions about their use. Such objects proved to engage users in non-verbal communication, especially if the action-sound relationships are simple. Strategies for the transition between habitual and experimental actions still remain to be explored. The integration of the speaker in the body of the glass is necessary in order to improve usability and to conduct exploration within real-world context such as a dance club or a cafe. The next steps for The Flo)(ps project will focus on more abstract sonic feedback for habitual actions in order to break the expectations of the user and facilitate unusual gestural interaction.

Strangeness may be the key to exploring the boundary between the familiar and the unknown gestures, as witnessed by this reflection of one of the The Flo)(ps users: "As I become immersed in my experimentation with the drinking glasses, their familiarity gradually becomes odd to me, in the way a word can gradually acquire a strangeness if we repeat it over and over again. This turn from familiarity to estrangement allows for a rediscovery." [1] It is my hope this project raised questions and awareness that such playful and embodied reflection can be stimulated and sustained through novel sonic experiences within our everyday contexts.

ACKNOWLEDGMENTS

Many thanks to Yon Visell for software development, Martin Peach for electronics advice, Fabienne Meyer and Thomas Tobler for fabrication support. This project was supported by the European Commission project CLOSED and the Interstices Lab, Hexagram, Montreal.

References and Notes:

1. K. Franinovic, Flo)(ps website, <http://zero-th.org/flops.html> (accessed September 2011).
2. K. Franinovic, "Enactive encounters in the city," *Responsive Architectures: Subtle Technologies*, ed. P. Beesley, S. Hirose, J. Ruxton, M. Traenkle, and C. Turner (Riverside: Architectural Press, 2006).
3. K. Franinovic and Y. Visell, "New musical interfaces in context: Sonic interaction design in the urban setting," *NIME '07: Proceedings of the 2007 conference on New interfaces for musical expression*, 2007.
4. M. Hauenstein and T. Jenkin, Audio shaker, <http://www.nurons.net/audioshaker/about.htm> (accessed September 2011).
5. H. Ishii, A. Mazalek, and J. Lee, "Bottles as a minimal interface to access digital information," *CHI '01: Proceedings of the SIGCHI conference on Human factors in computing systems*, 2001.
6. A. R. Jensenius, *Action-Sound: Developing Methods and Tools to Study Music-Related Body Movement* (PhD thesis, University of Oslo, Department of Musicology, 2007).
7. D. Rocchesso and P. Polotti, "Designing continuous multisensory interaction," *Proceedings of Sonic Interaction Design workshop at Computer-human interaction conference*, Firenze, 2008.