

HOW CAN DESIGNED RESONANCE IN INTERACTION INFLUENCE THE SOCIALITY BETWEEN TWO STRANGERS?

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ABSTRACT

During this study it was explored how resonance in interaction could have an influence on the sociality between two people who do not know each other. This is then related to the effect of bringing different backgrounds together in a socio-cultural environment where means for advanced sociality are necessary. A physical prototype designed as an engagement catalyser has been used to accelerate the process of becoming engaged with somebody. The prototype has been enriched by adding different digital feedback variables. In an experiment consisting out of ten sessions with duo's it is researched what the influence could be on the relationship between two strangers after they have interacted with this the different modalities of the prototype. Finally the implications for designing with engagement catalysers and the steering of social intelligence are discussed.

INTRODUCTION

ESSENTIAL DETAILS

The basis of this research finds its origin in the research on perceptive qualities in interaction as described by Stienstra, Alonso, Wensveen and Kuenen (2012). It elaborates on the (es)sence project by Pierre Lévy et al [2] which questions the value of designing for details in irresistible interactions. However, the majority of previous projects like Kinetic Folds [3] and Kik [4] were

focussing on the interaction between a single user and an artefact. This research has a strong focus on how designed details could have an influence on two people and the perception of one another when they have a simultaneous interaction with the same artefact.

TRANSFORMATION SOCIETY

Nowadays we have to cope with numerous societal challenges such as pollution, safety and health issues. The collective thinking that is being facilitated because of on-line debating [5] results in the growing realisation that we cannot continue living the way we have been living [6]. In order to facilitate this Sanders and Stappers (2012) suggest to support conviviality and find a balance between consumptive activities and the ability to participate in creative activities. Indications of change can be found in the recent interest and enthusiasm for design thinking [7]. These changes have implications for the disciplines of design and design research resulting in emerging fields like design for innovation and design for transformation [6]. In order to design for this the collaboration of many different backgrounds is necessary since the challenges are often too complex for any single stakeholder to resolve [5].

ENGAGEMENT CATALYSERS

To get towards these new ways of working together it is necessary that new methods, processes, techniques and tools are developed in order to build a constructive dialogue [8]. For this research it was chosen to work with an engagement catalyser as one of these new techniques. The origin of this tool can be found in the design framework called Designing in Skills (Dis) [9]. During the process described in this paper the technique of creating the tool is used as a mean to connect people and enhance engagement, empathy and respect through collaboration [8].

RESONANCE IN INTERACTION

Based on the elements of the (es)sence project the research that is done contains three elements that are taken into account during the study. These three

elements together form the basis for the notion of resonance in interaction; the perfect interplay between a product and a person which evokes strong positive emotion [10]. For this research it is chosen to focus on three elements that are believed to be part of this resonance [2].

DETAILS

In general details are spoken of as individual facts or items (Oxford Dictionary) and therefore often part of a bigger whole. A detail on its own is not always perceivable. However, the importance of the data that is contained inside the detail only becomes visible when it is missing and therefore influencing, in the case of design, for example the usability or functionality. This means that no matter how well the main features are designed, if a sequence of interactions has poor details it results in a more negative experience [11]. It is therefore chosen to work with designed details in order to see if a desired output can be influenced.

FEEDBACK

In this study the details that are designed are part of the person-product interaction that focuses on action-reaction coupling through feedback. Feedback as a design principle refers to the return of information about the result of a process or activity. When referring to interaction design this information can be any type of data [12]. Here feedback is divided into a functional, augmented and inherent element. For this research there is a strong focus on the inherent and augmented feedback. The physical part of the interaction contains information that is provided as a natural consequence of an action; feedback arising from the movement itself (inherent feedback). The other feedback that is given comes from an additional source and focuses on the cognitive skills of each individual (augmented feedback) [12]. The research element can be found in that interplay between the physical and digital action-reaction with the users. It is then researched, when using a variability for the augmented feedback, if this has an effect on the sociality between two strangers. The feedback has to stimulate the reinforcement of behaviour. The goal is to strengthen the behaviour and increase the likelihood that it will occur again in the future [13]. An engaging experience can make the feedback the character and personality of the interaction [11].

IRRESISTABILITY IN INTERACTION

When the cognitive system cannot directly understand what happens this is often because we try to fit something in a schema; a cognitive framework or concept that helps organize and interpret information [14]. For example, when you see an illusion your brain is trying to match sensory input patterns (bottom up) to perceptual templates (top down). If the template matches this is translated to your conceptual knowledge and the illusion can no longer be unseen [15]. Unconsciously your brain does this the whole day. It is when we are surprised and we are in need of a deeper understanding that we notice this.

EXPERIMENT

PROTOTYPE

In order to investigate the influence the designed resonance on sociality the prototype should have physical features that can influence the direction and intensity in which sociality unfolds during interaction. The characteristics that are supporting social functionality are called social affordances; features that allow for communication, cooperation and sharing [16]. With the focus on a simultaneous collaboration these features are used to influence the social behaviour of the participants. Their actions and behaviour correspond with their intentions and personalities and are unconsciously compared to the other person in order to evaluate one's own actions during collaboration [17]. This is the response that is measured after each session. The prototype that is designed is based on the principle of kinetic origami and uses this to create a surprise effect and need for understanding [18]. The artefact had a multifaceted dynamic that only can be explored through physical interaction. Each of the sixteen triangular shapes had an opaque surface that could be set to an individual colour. The speed, sequence and intensity of how these surfaces changed colour could be controlled through programming (Figure 1). These items were used as the presumed effect during the research and is manipulated. There were two different modes developed in which the change between different colour settings and the reward for every task were different (mode1 and mode2). One mode had the designed details of hierarchical timing [19] and used this principle of motion to convey which parts of the object were most important by creating a path for the eye to follow. The reward in this mode is based on the feedback of the slots and has a higher vividness; a richness that is increased by a medium through (multi)sensory stimulation [16]. This is done by a continuous and dynamic change in the colour, speed and brightness of each triangular surface, creating a 'disco' effect. The other mode lacks both these implementations.

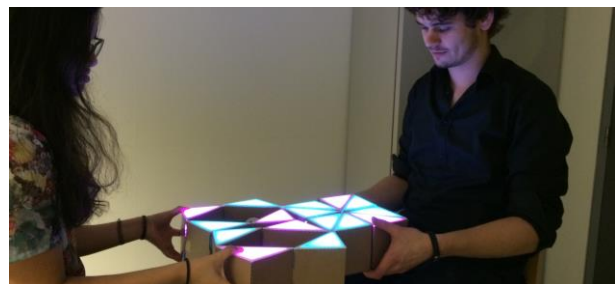


Figure 1: Two participants interacting with the prototype.

PARTICIPANTS

The context for the experiments is defined as a collaborative environment within the educational model of Industrial Design at the Eindhoven University of Technology, Eindhoven, The Netherlands. All students and staff are part of the same educational model. Every participant was a student who is part of this educational model with an age between 18 and 28 years old. The students were chosen based on the condition that they did not know the other participant on a personal level

and that they were not in a collaboration at the moment or had not been in the past. A total of 10 duo's participated in the study; 5 duo's were asked to perform a set of task with the artefact containing mode1, the other five performed the task with the same artefact containing mode2.

PROCEDURE AND MEASURES

The duos were invited into a room containing two chairs that were faced towards each other. As a warm up exercise they were given two minutes to find the name of a game with the letters on the vertical surfaces by manipulating the tool, keeping their hands on the same parts. In this way they could explore how the tool reacted to their input, and more importantly, how they were influenced by the input of the other participant. They were told not to force their actions and 'listen' to the intentions of the other participant that were communicated through the tool. This warm up exercise was proceeded by a set of 6 puzzles; a graphic representation of what the participants had to recreate. They were instructed to minimize verbal communication during the tasks. Before the puzzle was presented to the duo they were asked to pay attention to the colour setting that was loaded for every puzzle. After they completed a puzzle they were rewarded according to the different modes. At the end of each sessions both participants filled in the same questionnaire separately from each other in order to assess their collaboration and their attitude towards the other person. The items to assess the collaboration were related to group affiliation, social action and social roles as mentioned by Marco Roozendaal (2009). The items to assess the attitude were based on personality assessment criteria [20]. Furthermore minor qualitative notes were taken during the session. For each session the time it took to execute the 6 puzzles was recorded. After each session people were free to make notes and give comments about what they had experienced. This data is taken into account in the discussion.

ANALYSIS

METHOD

The data was analysed using two different methods. The Wilcoxon signed Rank Test is a non-parametric statistical hypothesis test and was used to see if there was a significant difference ($p \leq 0.05$) between the different modes in general. Following up the program GenStat was used to interpret all individual data and make a comparison between all the individual items corresponding to the two different modes. For each item it was calculated if there was a significant difference ($p \leq 0.05$) between the two modes.

HYPOTHESIS

The experiment was set up to see if the difference in designed details of the two different modes would have an influence on the experience of the participants. There are two hypotheses since it was tested if the prototype had a significant effect regarding the items as a whole between the two groups and between the items as individuals.

Hypothesis 1

H0: There is no significant effect ($p > 0.05$) between the two groups regarding the items of the assessment on their experience.

H1: There is a significant effect ($p \leq 0.05$) between the two groups regarding the items of the assessment on their experience.

Hypothesis 2

H0: There was no significant effect ($p > 0.05$) for all participants regarding the individual items of the assessment on their experience.

H1: There was a significant effect ($p \leq 0.05$) for all participants regarding the individual items of the assessment on their experience.

RESULTS

The results of the Wilcoxon Signed Rank Test. The calculations resulted in a test statistic of 27. With a critical value of 25 for a two tailed test ($\alpha = 0,05$) this means that the H0 of hypothesis 1 cannot be rejected. The GenStat results showed the calculation for each different item. H0 of the second hypothesis, can only be rejected for the third item; group effectiveness.

DISCUSSION

Most of the items did not show a significant difference in the comparison for ($p \leq 0.05$). The items we feeling and shyness however, come very close to this probability ($p = 0.164$ and $p = 0.07$). This could be due to the amount of participants. In an ideal situation it would be better to have at least 30 participants per group to create a realistic view. It seems that there is no direct relation between the time aspect and the assessment on the experience. The group from mode1 conducted the tests in an average time of 5:41 minutes, just a little longer than the group from mode2 with an average time of 5:11 minutes. What however would be interesting to see how this time aspect is related to ability (internal) and effort (external) and the assessment of the experiences. From a psychological point of view the increase in effort to overcome a challenge by mastering the task can satisfy the individual [21]. This could suggest that the people who had to put more time and effort into performing the task could rate their experience higher. A sign for this is one participant who was colour blind and had to be instructed by the other participant about the colour differences. The time they took was foremost the longest (8:28 minutes) but their rating on the item proud of the group action was much higher than the average (a score of 8,5 against a 7,2 average in their group). Another sign related to this is the ability of the participants when performing the task. It is stated that an individual who is less able to perform a certain task will feel more successful as long as they can satisfy an effort to learn and improve. This means that the differences in ability can limit the effectiveness of effort when the individual achieves with a low failure rate [21]. This can be seen in the duo that conducted the task in a relative short period of time (3:58 minutes). With the warm-up exercise one of the participants of the duo guessed the word within a time of 15 seconds meaning that that person was very able to solve the puzzle. From the same duo the other

person indicated to have seen a similar structure as the prototype before he participated in the experiment. He therefore stated that he knew how the tool worked and did not need much ability to perform the tasks. This can be seen in, again, the rate of the item proud of the group action; a score of 6,5 against a 7,5 average in their group. It would be interesting to conduct the research again but with more focus on the aspects of time, effort and ability in order to see how this would influence the assessment of collaboration and attitude. It could be said that these items have more influence on how people perceive each other than the designed details used in this research.

CONCLUSION

The designed details in this engagement catalyser specifically do not have a significant effect on how people assess their experience. It can however be concluded that there are more influential items in the research that could have an effect on this. As mentioned in the discussion this could be researched in a different study with more focus on the items of time, effort and ability. Following up it would be interesting to see how the effect of an engagement catalyser can be steered into a certain desired direction. It could be discussed how the use of these tools can be (mis-)used in our current society and how influential the role of design has become in bringing different backgrounds together.

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