

# Talking in Circles:

A communication experiment on the effects of direct visual feedback-loops on group dynamics.

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## *Abstract*

**Talking in Circles (TiC) is a new technology experiment, conducting explorative research based on the concept of “breaching” termed by Garfinkel in 1967, which relates to projects like *Reflect* (2008), *Lego Serious Play* (1999) and *Simulation* (2014). The goal is to investigate: What effect does a real-time technological feedback loop, evaluating participation, have on the dynamics of a group discussion? TiC does this by means of an interactive feedback loop, controllable by the participants through foot pedals. Evaluation is visualized by circles projected onto the surface of the discussion table. Studied is: What effect does seeing an evaluative reaction of one’s participation in real-time have on the group dynamics and on the participants? After having analyzed the quantitative data collected from the use of the foot-pedals, and having combined that with the results derived from content analysis of video data of the experiments. It can be shown that the effects of the system on the group dynamics produce diverse reaction patterns varying from heightened to reduced participation and that very different leadership forms manifest themselves in each of the sessions.**

## **1. Introduction**

The research undertaken here is explorative. The goal is to explore the ability of working with new media in studying social behavior. The research results of explorative research are not broadly generalizable; they are not able to prove cause and effect relationships as is the case in explanatory research. The choice for explorative research was made because new media / social studies research is a new field of inquiry.

Specifically, in any form of interaction or conversation there are generally unspoken rules and protocols to which almost all participants abide. For instance, it is rude to interrupt someone while that person is speaking. Or it is rude to stare when approaching someone whom you have not met before, while it is, however, expected that you introduce yourself. A lot of these rules are conventions that enable us to converse and discuss things with others in an organized manner, making it possible for everyone to follow what is going on. The Garfinkel [1, 20] tradition of social constructivism focuses on these matters of social convention. According to Garfinkel the rules of social interaction are and need to be implicit; just like in riding a bicycle, the rules work just as long as

we do not think about them. Thus the study of the social rules of interaction requires making the implicit, explicit. But because we need many implicit rules to interact, making these rules explicit makes the researched very uncomfortable. Garfinkel named making the implicit, explicit: 'breaching'. In conversation the participants constantly judge one another's participation, but only implicitly. It is just not done, minute-by-minute, to tell others in a conversation what you think of what they say. But for the conversation to occur, you have to attend to what the other says and respond to it; i.e. you have to constantly implicitly evaluate the speakers and what they say. In this experiment that necessary implicit process, is made explicit.

Some of the implicit rules or conventions are bothersome and can create problems; for instance, by confusing volume with participation allowing the loudest person to dominate, or even worse to bully by out-shouting others. Or by assuming that just because someone is quiet that they are uninvolved and have no opinion on the discussed topic or have nothing worth saying.

This paper explores what happens when some general/social conventions (in regards to group discussion) are frustrated, circumvented, bypassed, thrown out, or just plainly demolished; whilst (thereby) other rules are strengthened, highlighted, emphasized and/or reimagined. Aspects of the implicit norms of group process/discussion are broken, whereby an alternative norm for the group process/discussion is made possible. The making of the implicit explicit is used in comedy --- for instance, there are clowns who mirror the actions of by-passers on a town square, creating a comic effect by playing with the unease that results from the clown's mime. A much less innocent use of this knowledge is when in marketing marketers try to influence decision making processes to decrease the barriers against spending money and to increase the chances of making sales [23]. In these two examples, understanding of general/social conventions is manipulated to achieve a goal. Understanding the way people generally react to common situations and the underlying implicit rules makes it easier to anticipate behavior, allowing for individuals (in some part) to be steered or influenced.

The '*breaching experiments*' designed and explored by Harold Garfinkel were one of, if not the first, group of studies on the role of implicit social rules. For instance, Garfinkel studied a man who had operatively become a woman who had to learn how to behave in a women's lavatory. In the beginning s/he could not pass as a woman and every time s/he went to the wc, women would stare at her. Slowly s/he mastered the implicit rules of the female lavatory and could pass as a woman. These rules work just because they are implicit; breaking them, learning them, changing them is all-uncomfortable.

Three contemporary breaching projects will be explained below in more detail. They are all group-dynamic projects that approach the general/social (conversation) conventions by disrupting the implicit, as is done in the system to be explained in this paper, *Talking in Circles* (TiC).

The projects are:

- 1) *Reflect* [2,3,4], which problematized group processes by adding a visual dimension of speech-controlled lights to interaction and communication.
- 2) *Lego Serious Play* [5-12], which added a tactile dimension to interaction and communication in management and education, by means of problem solving play with Lego.
- 3) *Simulation* [13-19, 27], which disrupted interaction and communication by separating listening and speaking from one another.

Each of these projects purposely created an imbalance in the perception and/or perspective of the participants. Normally how much one speaks is not visible, tactile skills are irrelevant to business decision-making, and turn-taking in speech is determined hierarchically; thus by altering accepted forms of communication, the experimenters claimed to create an environment where productivity/effectiveness and creativity within the group, could (supposedly) thrive. One wishes to question this claim.

TiC adds constant real-time participant controlled evaluative visual feedback to the discussion situation to invoke awareness of group dynamics. The goal of the research is to see if intense evaluative feedback will act as an inhibitor leading to stultified conversation and/or encourage participants to speak out (more) creatively. And, will the participants be aware of how they feel during the TiC session, and/or how they are being rewarded or punished by their fellows? Will a group norm be established or will individualized behavior result? Furthermore, will the disruption produced through TiC lead more to anarchy or to control? And finally, is this type of disruption liberating as the three experimenters referred to above assume, or is that assumption questionable? TiC thus explores crucial assumptions of the aforementioned experiments.

This thesis is arranged as follows:

- Section 2 reviews the projects that are contextually relevant to the TiC experiment. Furthermore the common denominator(s) between these projects and how this relates to TiC will be explored.
- Section 3 discusses the experimental method of TiC, including some technical considerations leading to the system's physical design. Additionally the tasks given to the participants taking part in the experiment are described.
- Section 4 consists out of conceivable dilemma's that came to light during the development stage of the experiment and how these questions were addressed. This section also discusses some of the limiting factors inherent to this style of experiment and how these were dealt with in TiC.
- Results from the collected data are presented under Section 5.
- Section 6 contains the conclusions, reflecting back on the research question, whilst presenting implications and possibilities for future research.

## 2 Related projects

The projects described below are similar to the TiC system. Describing the differences and similarities between these projects/studies, establishes the broader context in which TiC has to be placed.

### 2.1 *Reflect*

*Reflect* [2] is the product of the 2010 PhD dissertation of Khaled Bachour [3], with Pierre Dillenbourg and Frédéric Kaplan [4] as supervisors. In essence, *Reflect* is a mirroring tool designed to be used in a discussion/meeting setting. *Reflect* mirrors the vocal activity of participants in a group discussion. *Reflect* detects audible participation, the system then analyses the detected audio, and in turn the system produces visual feedback through the lighting up of LED's (located in the surface of the table around which the participants sit). More participation means that your color lights up more; less participation means your color lights up less. It was assumed that the participants would respond to the lights. Since the feedback produced directly corresponds to each individual's amount of audible participation, the system supposedly mirrors participation. Visualization in the *Reflect* system is called "*Territorial*". This refers to how each participant's designated color does or does not spread across the surface of the table. More LED's light up as the amount of vocal participation by any particular individual increases. When that individual's participation decreases, the lit area shrinks.

*Reflect* creates a real-time feedback loop based on the level of audio detected by an automatic system. *Reflect* adds a visual dimension to people interacting and communicating. It makes the participation of each person in the discussion in real-time, i.e. as discussion is taking place, visible. The implicit --- varying levels of participation --- is made explicit.

New technology can be used in social and communications research to disrupt implicit assumptions and to see what effect(s) this can have. But when the reliance on technology outweighs/replaces/ignores social psychological/sociological knowledge, the experiments are threatened to be naïve and/or irrelevant. "*Reflect*" suffers from such technological overindulgence. Quantity of speaking is definitely not seen in social science as the sole or key criteria for the quality of group participation. Just to cite Belbin [25]: the "monitor/evaluator" and "completer/finisher" speak little, but are crucial to group effectiveness. Therefore, within the TiC system, the analytical focal point is placed at the participant level acknowledging that human judgment is crucial. TiC was developed in the breaching experiment tradition, in order to ground itself within relevant social psychological/ sociological knowledge.

### 2.2 *Lego Serious Play*

Johan Roos and Bart Victor published their *Lego Serious play* [5] concept in 1999 [6], 2002 [7] and 2009 [8]. *Lego Serious Play* was focused on managerial [9] and educational [10] learning. *Lego Serious Play* was part of the Imagination Lab [11, 12]; a process research institute that existed from 2000 to 2006 in Lausanne,

Switzerland. The technique was initially designed as a management-learning tool and was broadened for general educational purposes; though it was based on prior MIT Media Lab work with children [26]. The focus was placed on the earlier managerial version of the *Lego Serious Play* experiment, although both phases have value to the experiment explained in this paper. The *Lego Serious Play* sessions referred to, thus are the managerial ones.

In the *Lego Serious Play* sessions, the participants were forced to deal with a problem/question in a tactile manner; the participants used Lego to describe themselves and the situation under consideration, by way of constructing personas (avatars) and circumstances represented in Lego. Personas, circumstances, and proposed action(s) were all externalized in the use of Lego. The serious play sessions were generally designed for a group with a problem to address.

Playing with Lego is a form of interaction that nearly all people once knew as a child using their imagination to express themselves through the act of play. As children mature, they are taught to use more cognitive ways of communication, and as they grow older, playing with toys and possessing an over active imagination is frowned upon. Thus children mature and stop playing with toys, they lose the naïve, innocent and imaginary fashion of communicating, which they possessed when they were younger.

In *Lego Serious Play* sessions, the participants used Lego to represent and thereby communicate their individual position within the group, and their perspectives on the problem posed. By using Lego, there was an incentive for the participants to revert to skills long forgotten of naïve and childlike forms of communication. This makes it more difficult for persons to use their mature intellect to filter intentions and supposedly provides for more creative (playful) responses. The skills needed to represent self, situation, and change are thus, through tactility (i.e. by building Lego avatars, buildings, mazes, worlds), distributed differently than in daily managerial roles. Lego serious play evokes another skillset than that of management hierarchy, allowing for the creation of social imbalances, introducing the possibility for additional/alternative creative possibilities.

For example, each individual in the group is asked to portray themselves in an avatar using the Lego pieces provided: different sets of puppets, legs, torso's heads, hats, weapons, blocks, capes, etc., etc.... are on offer. Each individual is asked to place their avatar in their perceived position within the group and situation. The placing, form, and moving around of the avatars, and other objects representing aspects of the 'situation', shows how the issue under study and the group dynamics are perceived by each individual. A session includes several rounds of positioning the avatars and other symbols, and of discussing why objects are where they are, and what they symbolize. Hereby it becomes possible to see patterns in the individual and group behavior. Eventually all the avatars, and other objects representing aspects of the situation under review, are placed in a final assemblage, which is then discussed.

The session is seen as having succeeded when the group leaves with an alternative perspective on their situation and with a clearer understanding of

their problem, hopefully enabling them to find a solution to their problem. While making discussion depend on tactile skills certainly breaks up established adult assumptions and thereby makes some of those implicit assumptions explicit. Lego serious play was sold as a consulting tool for generating better and/or more creative business solutions. The 'breaching' of communication routines by emphasizing the tactile and de-emphasizing forceful persuasion was not really studied. The implicit was destabilized, but what did the participants and/or the researchers really learn hereby?

### 2.3 *Simulation*

*Simulation* [13,14,15, 27] is an experiment designed by Philippe Mairesse [16, 17] in 2001; it is an experiment in communication, the intention of which is about the interactive quality of communication and not about delivering any specific content.

*Simulation* is intended for a large group of +/-12 people, sitting at a table connected to a system of microphones and headphones and switch boxes, all intertwined and connected to each other through cables to a single control-box. Because of this, it looks like a creature with a main body and 12 tentacles. Therefore, it was dubbed "the octopus". The octopus controls all the connections set by the 12 switchboxes. Each headset with microphone is connected to a switchbox with one dial to change between the listening-channels and a LED to indicate if the system is on.

The microphone is set to one channel and the headphones are connected to the switch in the switch box, which allows the participant to change between channels. The system allows one to speak to as many listeners as are tuned in to your channel, although you have no idea how many there are. There is a way to have a one-to-one conversation, but this only happens on the occasion that "participant one" is listening to the channel of "participant two", while "participant two" is listening to the channel of "participant one", although an unknown number of participants could still be listening in.

In normal conversational situations, you look at someone and there is a whole system of conventions on how to start a conversation. *Simulation* stops these from functioning, thus creating a very strange situation. It forces the participants to relinquish a certain amount of conventional control, normally present in the general communicative situation. Due to the disruption in communication conventions, the usual hierarchical control within a group does not occur; i.e. wherein teacher speaks in front of class, meaning that the students have to listen, and if a student doesn't listen the teacher tells him/her to be silent and to pay attention. This is a normal situation where authority plays a mayor role. But in the sessions of *Simulation*, this is made totally impossible.

Mairesse's hypothesis was that the situation would stimulate creative thought by reducing authority. The hypothesis made by Mairesse appears to be a partly correct one. *Simulation* does circumvent many aspects of authority. Although the stimulation of creativity may be more dependent on the willingness of the participants rather than on the disruption in communication created by *Simulation* and thus the effects of reducing hierarchical structure are less than

certain.

For instance, in one session that took place at The Centre Pompidou in conjuncture with the Institut Télécom, Paris, the experimentation led to a verbal confrontation between one of the participants and one of the co-organizers of the colloquium during the debriefing portion of the experiment [18, 19]. The confrontation was made possible due to the way *Simulation* demolished authority, allowing a participant to voice issues, which without the use of *Simulation*, would have gone unspoken and/or unnoticed to most present. The system provided a break from authority, allowing for the occurrence of something unexpected. But for it to lead to creativity, the participants have to be willing to exploit the disruption of implicit speech hierarchy and rules, created by the system.

#### 2.4 *The common denominator*

In this section, the traits of the breaching experiments, which bind these three projects together, are discussed in more depth. The above projects are related to and are based on the concept of the breaching experiment as defined by Garfinkel [20]. A good example of breaching experiments is the restaurant scenario.

Imagine someone entering a restaurant. The waiter asks: "What do you wish to order?" The customer responds: "I want the bouillon soup, a steak, and a piece of the lemon meringue pie." The waiter leaves with the order and returns 15 min later with the lemon meringue pie. Obviously, this is not what the person expected, and the customer attempts to protest ... But before the person can utter a first word, the waiter shouts: "YOU ORDERED THE LEMON MERINGUE PIE, DIDN'T YOU?!!! DIDN'T YOU?!!!"

What normally happens, now, is that most people, when treated in such a manner, will either become very aggravated and vocal, or they will be so surprised, shocked and confused by the situation, that they will not know how to respond, and therefore they will just eat the pie first. Interestingly there does not seem to really be a response in between the two extremes.

The reaction that people give, is what in fact, is interesting. To see how and why people react in a certain way when they are taken out of their comfort zone is something that tells a lot about the person(s) observed. It reveals our dependence on unwritten social expectancies and our shock when confronted by their breakdown. The order in which the food is supposed to arrive is an implicit social assumption, by disrupting it, the experiment makes the social order we just assume, and which gives us our sense of safety, explicit. The problem with such experiments is that they only work on unknowing participants, and the confusion and aggravation they produce, presents an ethical dilemma.

Also the experiment described in this paper, is based on the breaching experiments by Garfinkel. In this experiment, as in the three projects already described above, the participant's reactions and actions to altered social conventions are studied. For instance, it is not the lights, as such, of *Reflect* that tell people that they are keeping (very) quiet or that they are supposedly speaking too much; it is by observing the lights that they become acutely aware

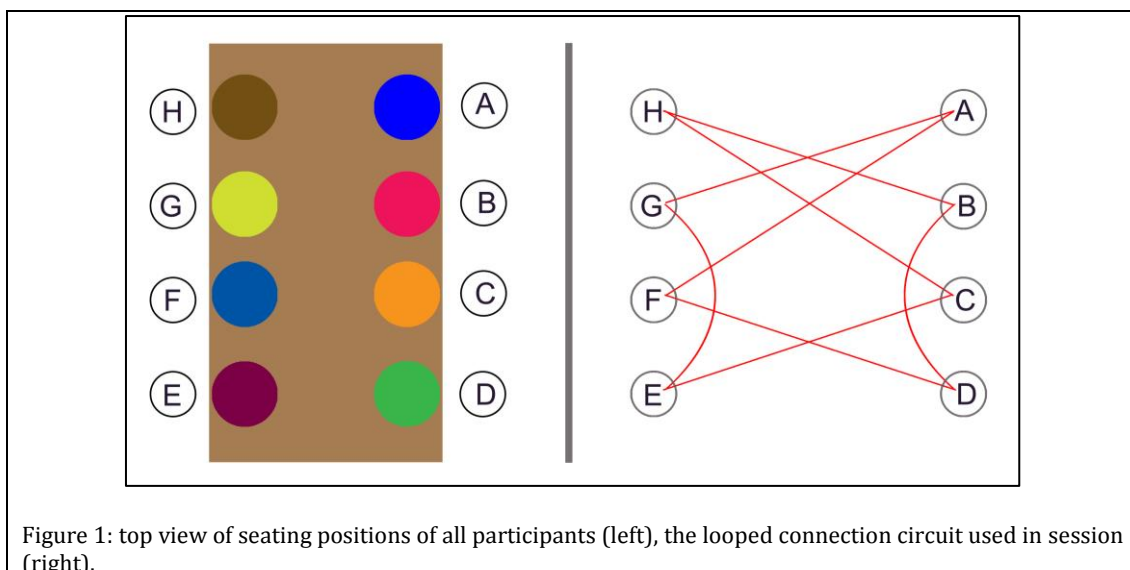
of their behavior, and their own position within their social surroundings. It is that awareness that counts. In *Lego Serious Play*, it is not playing with Lego that enables the group to see a problem in a different light, but it is the interaction with Lego that allows the participants to discover an alternative method of perceiving themselves and their problem. Likewise in *Simulation*, it is not the disruption in the communication that (perhaps) enables authority to be broken and creativity to flourish, it is the participants becoming aware that authority is ever-present, and by having this awareness that they can be liberated, to let creativity flourish.

### 3. The experimental method of TiC

TiC is a communication group-experiment, where the effect of a direct-feedback loop on group dynamics is investigated. The initial idea behind TiC was to see if the combination of aspects taken from projects like *Reflect* and *Simulation* would allow for a more effective way of researching the topic in depth.

#### 3.1 TiC evaluation system

The system consists of a discussion table with eight seating positions (Figure 1, left), each position has an uniquely colored ball projected on the surface immediately in front of it; the balls are adjustable in both size and brightness, the two variables are linked. Thus when the ball grows in size so does the brightness and visa-versa. At each position there is a foot pedal, when the system is initiated it gives the pedals control over the balls. One pedal controls one ball resulting in a loop of linkages (Figure 1, right); A controls F, F controls D, D controls B, B controls H, H controls C, C controls E, E controls G and G controls A; the system does not allow control to be assigned to direct neighbors or opposite-facing participants, this is done to increase ambiguity among the participants and to avoid socially desirable behavior (participants altering their behavior in such a way to conform to norms of conviviality, hoping to please others they believe are assessing them, in order to get desired results).



### 3.2 *TiC session*

The TiC experiment consisted out of three separated rooms; in the first room was the “*Meeting Room*”, the second room was the “*Position Assignment Room*” and third room was the “*Discussion Room*”.

In the “*Meeting Room*” all the participants were gathered. This was where initial introductions were made and, when everyone had arrived and settled in, it was the area the participants were briefed on how the system physically functioned. Furthermore they were briefed on what their tasks were during the experiment and were given the topics for discussion.

The participants were asked if they had understood everything, and when this was achieved, the participants were asked one-by-one to enter the “*Position Assignment Room*”.

In the “*Position Assignment Room*” each individual participant was privately asked if they still had any questions. If so, these were answered by the experimenter. They were asked to pick one of the laid out folded closed pieces of paper. The paper showed them which color of their own position and which color their foot pedal controlled. Finally, they were asked to take their seat at the table (Figure 2) in the “*Discussion Room*”.

When all participants were seated at the table in the “*Discussion Room*” they were told to begin the discussion. The sessions were recorded by means of video, together with the recording of the feedback values produced by the foot pedals; these form the primary source of data of the experiment.

A buzzer would sound to inform the participants when it was time to change to the next topic, and if necessary this would be the time for a quick (comfort) recess. When two discussions were finished, the participants were asked to fill out a questionnaire and were given the opportunity to discuss their experience. This concluded the TiC experiment session.

### 3.3 *The tasks for the participants*

- Actively participate in the discussion of the topics.
- While seated at the discussion table, and while the discussion was ongoing, to have one foot on the foot pedal at all times, in order to be able to provide assessment of the participation of their assigned participant. (The foot pedal controlling the amount of color displayed, correlating to the judgment of the level of participation) This condition only applied for the second discussion, while the system was active.
- To refrain revealing which color they were controlling.

The experiment is process focused; the participants have been given the task of evaluating the quality of individual participation in the discussion, and not whether or not they agree with the evaluated participant’s opinions. Within a discussion, people will have different opinions, and the articulation of these

differences is what makes the discussion lively/interesting; and, in fact, possible. If everyone agrees there is nothing to be said, and thus there won't be a reason to have discussions. Therefore it is not the goal of the experiment to measure (dis-)agreement among the participants; instead it is the character of the participation that is of interest and the attempt is to have that visualized.

The group was given the choice of three pre-established topics for two discussions. The first discussion would be used as a baseline (without the system activated), during the second the system would be engaged. Each discussion was permitted a time of minimum 10 minutes and a maximum of 30 minutes, depending on the discussion circumstances.

At the time of the experiments (Dec. 2013) the topics were:

- 1) Is it socially acceptable to actively use your mobile phone while having dinner with friends or family?
- 2) Should the Dutch version of the "Zwarte Piet" tradition (The black-faced helpers during Saint Nicolas festivities) be altered due to allegations of racism, and what is the overall consensus of how this topic was being publically discussed?
- 3) Is television (or some more modern equivalent) beneficial or detrimental to the development of youth?

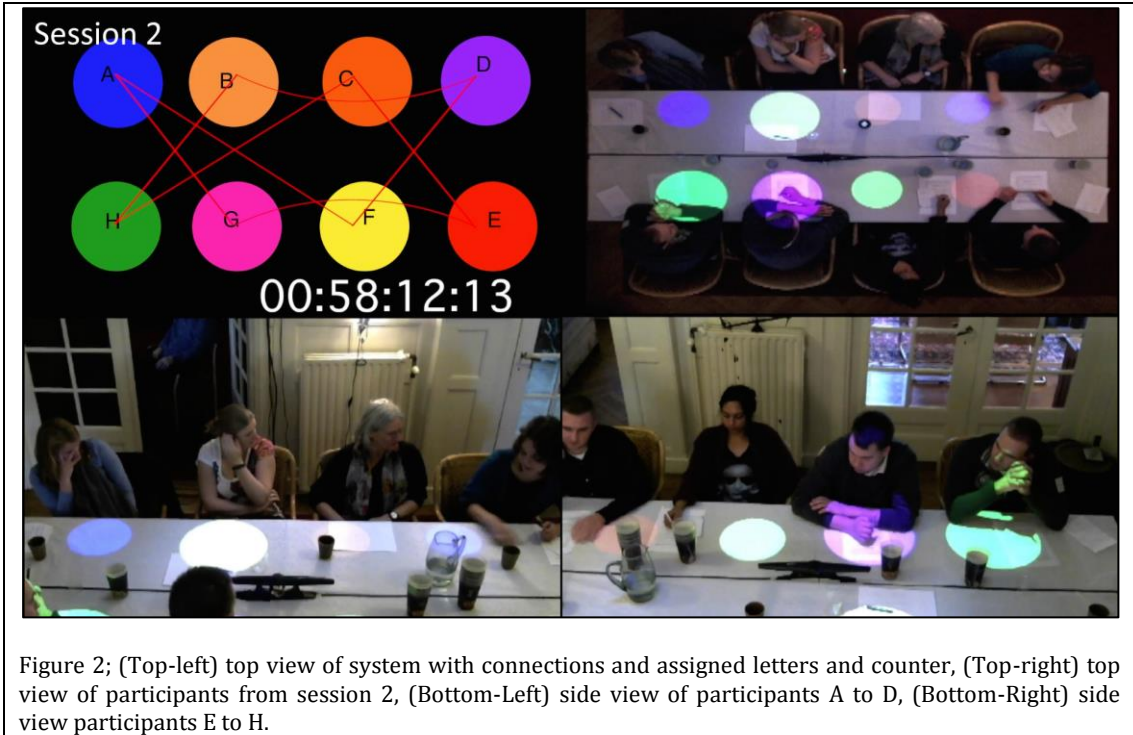
### *3.4 Participants gathering*

One of the prerequisites was that the participants were "virgin" users to the system and had no prior knowledge of the functioning of the system and its underlying goal. Another requisite was that each of the participants had some prior knowledge of the topics that were going to be discussed, with the idea that this would benefit the discussion. The participants consisted out of a pool of people gathered through social media, consisting of fellow students, relatives and friends. The experiment included three groups of eight participants.

### *3.5 Data collection/scoring*

The TiC experiment produces two sources of data: the activity logs produced by the movement of the foot pedals and the video/audio recording made by webcams positioned around the discussion table (Figure 2). The video data was analyzed by means of content analysis based on the analytical framework of Henri [21]. The content analysis of the TiC video data consisted of 5 criteria looked for in the behavior of each individual participant. These five are: (i) Participative listening; (ii) Social presence; (iii) Interactive amount of contributing); (iv) Cognitive level; and (v) Leadership. Each of these 5 criteria was given a rating from 1 though 5; 1 being failed, 5 being excellent. Each participant was scored on each dimension for the pre-trial run (i.e. without the feedback loop) and the experimental situation (i.e. with the visualized feedback loop working in real time). Per person, a representative slice of 3 to 4 minutes

out of each discussion was scored. The data from the foot pedals consisted of a continuous stream of values ranging from 0 to 100 (Figure 3).



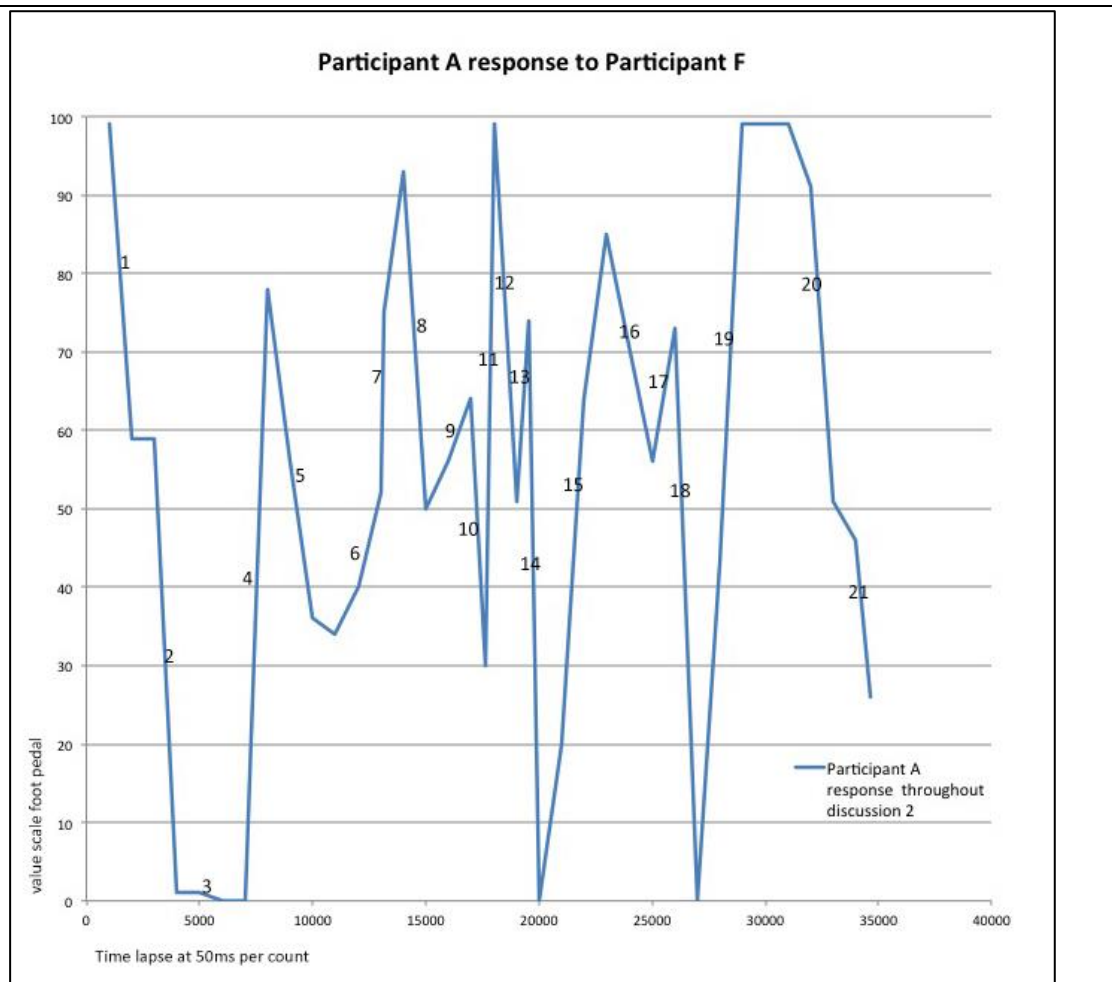


Figure 3: 1 out of the 8 Graphs from discussion 2 out of session 1. This graph shows the data collected from the foot pedal controlled by Participant A responding to the participation of Participant F. The horizontal axis is time duration at a rate of 50ms. per value given and the vertical axis being the values produced by the foot pedal ranging from 0(heel fully down) to 100 (toes fully down). The graph also contains numbers on the line placed at each obvious change in value, the total changes in the graph above is 21 which is just below the average of 22.25 for that session. The duration of this discussion was 28.59 min.

## 4. Possible pitfalls and reasoning

Here, perceived possible criticisms and problems in research design are discussed in detail, examining how these came to light and how they were approached, countered, and/or dealt with. Having decided to use new technology to breach conversational norms and thereby to study group interaction disrupted by technologically supported feedback, does TiC provide the means to the goal?

### 4.1 *Problems in concentration and overcrowding*

It was brought to my attention that, in effect, asking the participants to discuss, evaluate and reflect on themselves might overload them (Lissack, [22]). Prof. Lissack argued that if all the participants evaluate another participant within the group, while actively participating in the discussion, they would in effect be asked to split their attention between participation and evaluating, making it impossible for them to properly focus on either.

According to him, this would either cause the quality of the participation to deteriorate, or the quality of the evaluating process, for most people are incapable of splitting their attention in such a manner. An easy fix, for this issue, is to split the tasks in two by having two groups; one group forming the discussion group, and another group evaluating the discussion group members, but not participating in the discussion. This criticism definitely has some validity and it certainly could be a problem within the TiC system.

There are two main reasons why it was decided to keep to the initial setup. The first was that the experiment revolves around a group discussion where it is expected that as a “whole”, all participants take an active role; the current assumption is that there should be enough leeway within the discussion to be able to assess the participation of another participant, while still being able to actively take part.

The second reason to stick to the initial plan was the size of the experiment. The initial idea was to keep the experiment as small as possible, in order to keep to a small number of research parameters, to make sure that the data that is collected stays relevant to the question being researched by the experiment. The proposed alternative of adding a second group to divide the tasks, would greatly increase the number of parameters and the amount of data that needed to be collected, potentially over complicating the experiment by having data produced that needs analysis when it might not be needed. Correlating the experimenter’s observations of the (videoed) group discussions with the TiC participant data (how and how much did they make use of the pedal) and comparing that to the session evaluations was complicated enough. The experimenter believes that by adding external observers would have made the experiment unmanageable within the scope of this thesis. The fact that this alternative setup came to light might mean that it provides an interesting future suggestion for research.

### 4.2 *Participants as recyclables*

Another very different methodological issue has to do with the family of social science investigation to which my experiment belongs. Most, if not all of the

experiments in line with the “*breaching experiments*” by Garfinkel, suffer from a short lifespan. The reliability of the data can only be ensured with new “virgin” participants, who have no prior knowledge, understanding or expectations concerning the experimental system.

As participants gain understanding of the experimental system’s intent via participation, the participants become able to anticipate the events and/or deviations occurring due to the system, thus gaining knowledge on how to influence the results. The factor of unexpectedness is lost and the participants normalize what were at first unanticipated inputs.

This causes a loss in validity of the data. The ‘breaching experiments’ examine normal assumptions by studying how participants react when these assumptions are interrupted. When the element of surprise disappears, the experiment’s ability to see participants’ unguarded reactions disappears, making the data from additional sessions meaningless. Consequently, the data is only valid as long as the participants are ‘naïve’ in their responses.

Since these types of experiments only work for one session, it is unwanted to use the same group twice. Thus these experiments are not suited for studying a group of participants long-term. Hence it becomes very difficult to investigate if insights gained in the first session have had any lasting effect.

For if the participants would indeed redo the same experiment again, they would not actually be in anything like the same situation as in the first session, and they then would show behaviors not comparable to the first session. It would be unclear if the changes were in reaction to the breaching activity or if the participants were producing what they thought was expected of them. This is why the feedback loop within TiC is interesting, for it has the possibility of increasing the amount of usable data from a single session. This inherent issue of not being able to repeat the experiment brings along another problem.

#### *4.3 No-one is spontaneous these days, self-control all around*

Another difference between TiC and other breaching experiment systems is that most of the other experiments rely on the individual participant’s capacity to self-reflect. There is limited or no external-feedback (that is, feedback from other participants) given. When in the rare occasion that external-feedback does occur, it is often seen as extremely aggressive and confrontational.

All breaching experiments consist of two parts: there is the experimental session and then, afterwards, there is the debrief/review/evaluation.

Due to the linear nature of the setup of the experiments, the feedback provided by the participants in the review sessions is indirect. Meaning, it is often focused on a few key moments; which quickly become a generalization, or supposedly exemplary, of the experience.

Due to this clear split between interaction and realization within the experiment the participants actually have time to reflect on the situation; allowing them to make a whole/complete/sensible “story” out of their experience, whilst leaving out subtle/out of place/ missed occurrences. Due to this post factum factor, the feedback has the risk of losing its spontaneity/sincerity and of ignoring ‘weak signals’ by favoring the ‘big picture’.

But in the TiC discussion sessions, the participants were forced to give a direct

response to an ongoing situation; there was no time to reflect. This leads to feedback that is less filtered (reflected upon), providing for a more direct response occurring during the entire period of experimentation. Since the participants are in a constant role of evaluating, whilst being evaluated, small deviations from the social norm have a greater chance of being reacted to. All in all, this ought to provide a far more responsive/complete portrayal of the situation.

The hypothesis is that due to the fact that the feedback is noticeably present in the TiC sessions, that there will already be a strong reflective awareness aspect present at an early stage, while this is generally only achieved by the other experiments in later stages.

#### *4.4 Familiarity or social contamination*

During the experiment it was chosen to keep the experimental conditions of each session as identical to each other as possible to prevent data contamination. This meant that the order of each session was the same; first the discussion without the system activated and then the discussion with the system activated. There is a possible issue with keeping the order of the sessions identical, and that is familiarity among the participants. To what degree does the duration of the session increase familiarity and thus have an effect on the data produced?

If the experiment had been run three or more sessions, it would have been possible to have one or two sessions run in the reverse order; that is, starting with the system activated. Or one could have had a session without the system ever being activated at all. This could possibly show if the data produced was influenced by familiarity. But since the experiment only ran three times there was not an opportunity to allow for testing for placebo effects. But since the research was exploratory and not explanatory, and its goal was to demonstrate new media / social studies research as a new field of inquiry, this concern was not taken into account. In an explanatory experiment the links between feedback and behavior would of course have to be delimited and investigated much more rigorously.

## **5 Results**

Within section 5 the collected data from the three sessions is presented and analyzed. This is done by comparing the participant-to-participant foot pedal/visual feedback data, with the data derived out of the content analysis of video data of each session, allowing for a description of the composition and group-dynamics of the sessions to be constructed; and emphasizing similarities and differences; and evaluating the breaching aspects.

### *5.1 Visual feedback analysis*

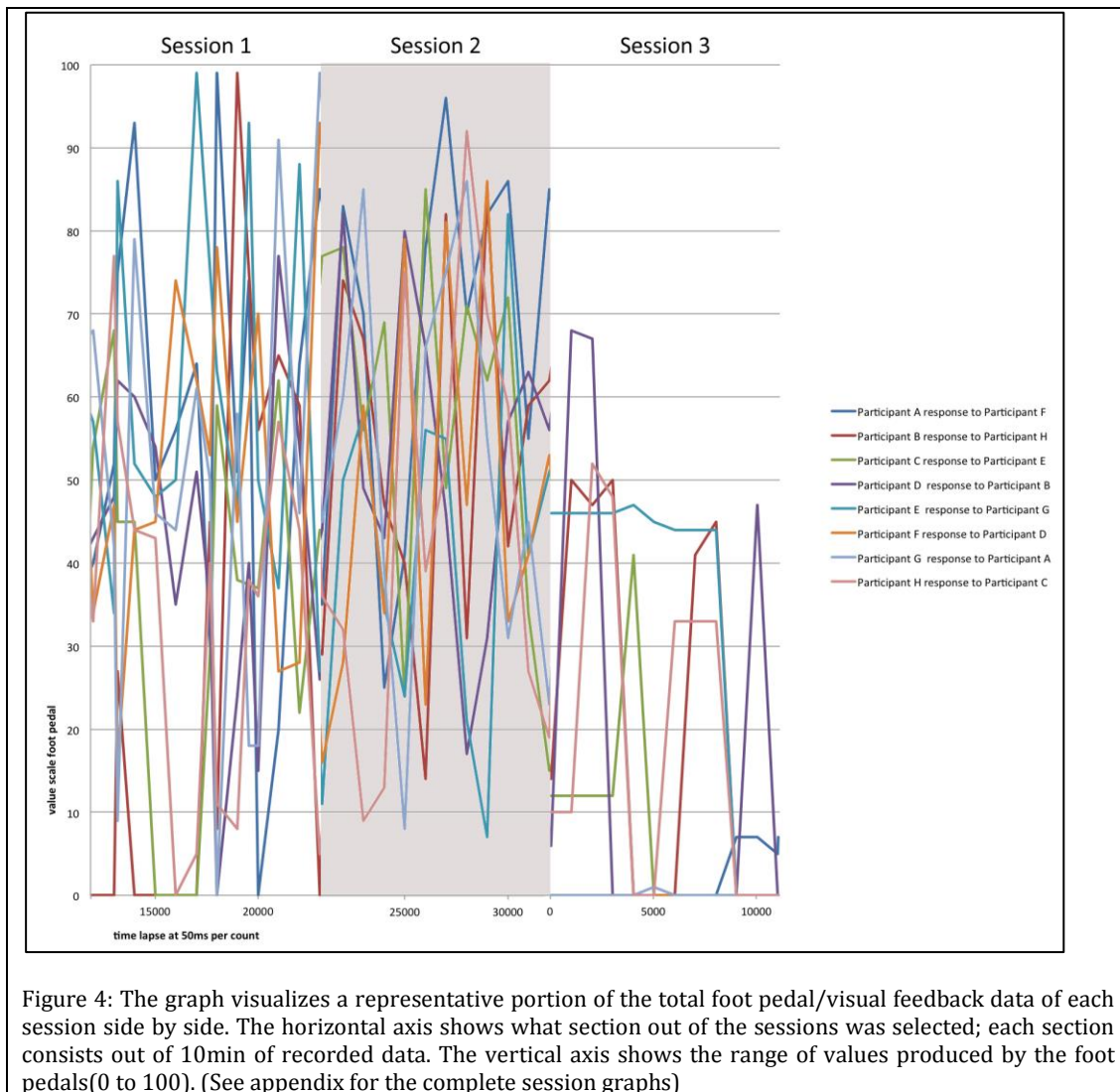


Figure 4: The graph visualizes a representative portion of the total foot pedal/visual feedback data of each session side by side. The horizontal axis shows what section out of the sessions was selected; each section consists out of 10min of recorded data. The vertical axis shows the range of values produced by the foot pedals(0 to 100). (See appendix for the complete session graphs)

Displaying the data from the three sessions, side by side, produces Figure 4. The recorded data of the participant-to-participant use of the foot pedals/visual feedback has been examined along two parameters: density and intensity. By density is meant how much the system was used in terms of time lapsed between actions. Low density (session 3) means that (comparatively) a lot of time passed between usages/interactions of the system; very high density (session 2) means that the participants continually were increasing and decreasing their (visual) feedback judgments. Session 2 was 'hectic' (that is, there were constant changes in evaluation), while session 1 was more moderate, with only one period of hectic-ness.

By intensity it is meant: did or did not the participants choose for the brightest and least bright possibilities of visualization. Session 1 used the full range of the system; visualizing from 0 to 100, session 2 mostly ranged from 10 to 90, and session 3 mainly ranged from 0 to 50. Thus on both criteria the three sessions differed from one another.

## 5.2 Content analysis

| <i>Scoring Experimental Situation Session 1</i> |           |          |             |           |            |       |
|-------------------------------------------------|-----------|----------|-------------|-----------|------------|-------|
| D1                                              | Listening | Presence | Interactive | Cognitive | Leadership | Total |
| Average Sc.D1                                   | 4.6       | 4.4      | 4.4         | 4.6       | 4.4        | 4.5   |
| SD D1                                           | 0.5       | 0.7      | 0.7         | 0.5       | 0.7        | 0.6   |
| D2                                              | Listening | Presence | Interactive | Cognitive | Leadership | Total |
| Average Sc.D2                                   | 4.9       | 4.8      | 4.9         | 4.8       | 4.5        | 4.8   |
| SD D2                                           | 0.4       | 0.5      | 0.5         | 0.5       | 0.5        | 0.4   |
| <i>Scoring Experimental Situation Session 2</i> |           |          |             |           |            |       |
| D1                                              | Listening | Presence | Interactive | Cognitive | Leadership | Total |
| Average Sc.D1                                   | 3.8       | 3.3      | 4.1         | 4.3       | 2.0        | 3.5   |
| SD D1                                           | 0.7       | 1.0      | 0.4         | 0.7       | 1.2        | 1.2   |
| D2                                              | Listening | Presence | Interactive | Cognitive | Leadership | Total |
| Average D2                                      | 2.9       | 3.3      | 3.6         | 3.5       | 1.9        | 3.0   |
| SD D2                                           | 0.6       | 0.9      | 0.7         | 0.5       | 1.0        | 1.0   |
| <i>Scoring Experimental Situation Session 3</i> |           |          |             |           |            |       |
| D1                                              | Listening | Presence | Interactive | Cognitive | Leadership | Total |
| Average Sc.D1                                   | 3.4       | 3.5      | 3.1         | 3.3       | 2.8        | 3.2   |
| SD D1                                           | 1.1       | 1.4      | 1.4         | 0.9       | 1.2        | 1.2   |
| D2                                              | Listening | Presence | Interactive | Cognitive | Leadership | Total |
| Average Sc.D2                                   | 2.9       | 3.3      | 3.6         | 3.5       | 1.9        | 3.0   |
| SD D2                                           | 0.6       | 0.9      | 0.7         | 0.5       | 1.0        | 1.3   |

Table 1: Video Data; The values above are the average scores together with the standard deviation(SD) for each of the 5 factors produced by the participants from Discussion1(D1) and Discussion2(D2); these average values are derived out of the individual participant data produced through content analysis of the video data.

Between the sessions 1, 2 and 3, we observe big differences in the content analysis of the video record. The result of the experiment each time was to push all the group session values (Table 1) more to the extreme, but in session 1 that was to higher levels and in 2 and 3 to lower ones. In session 1 all individual values (results participant by participant) stayed the same or increased between the trial and experimental situation, but in session 3, three participants shifted upwards and five downwards, and in session 2 all participants shifted downwards.

Thus the experiment produced a common group reaction towards more involvement and activity in group 1, while the very high cognitive level pre-breaching, in session 2, dropped dramatically when the feedback started, and the very low leadership level increased slightly. The breaching in session 3 lead to more division and to an even larger split in the group. In all cases, individual participant's scores on all factors moved in only one direction (i.e. all change was either upwards or downwards, never mixed). Thus the participation feedback loop in real-time had, in session 1, a collective effect towards more involvement, in session 2 it lead to more chaos (lessening of listening, poorer interaction and even weaker leadership), and in session 3 it had a divisive effect with a few participants becoming more dominant and even more participants becoming more passive. Tentatively it was observed that:

- The experimental situation did have an effect, pushing participants to be more active or passive, as the case may be;

- The experiment can push the group to be more or less homogeneous, and it is the one or the other;
- Movement in each session between the 5 factors of the content analysis was consistent (there are no anomalies or difficult to explain data);
- The experiment does not produce random or chaotic results.
- Ostensibly behavior observed on the video/audio data correlated with the quantitative data collected from the foot pedals.

Reflecting on the data from a social studies perspective: there exists an implicit social rule or convention that in conversation you don't give (too much) critical feedback. Group maintenance needs often include displays of acceptance, in order to avoid conflict and group disintegration [24]. Within TiC, this rule is marginalized or even abolished; the participants are intentionally placed in a situation where feedback is demanded of them, therefore potentially increasing tensions within the group. The fact that group maintenance conventions exist and that TiC succeeds in disrupting them becomes apparent when the difference in behavior/attitude by the participants is noticeable between the first and second discussion sessions. The shift in attitude between the sessions is contributed to by the system changing from inactive to active. Below, the behavioral effects that occurred within the three TiC sessions are discussed.

### 5.3 *Description and data from session one*

The participants of session 1 consisted of international orientated people coming from seven countries, all recent university graduates in various fields. All of the participants were between the ages of 25 and 30. It is the experimenter's opinion that each participant displayed a strongly developed set of moral values, allowing each of them to express thought-out opinions on a spectrum of topics, which they used to discuss, whilst allowing space for opinions to be questioned. Overall they were optimistic in nature, they were cheerful, and when the situation permitted, there was humor, even though the discussion was taken seriously.

From the collected data from session 1 it was visible that during the first discussion the participants were willing to give each other the benefit of the doubt, allowing their opinions to be influenced by what was being said. A few participants preferred to remain more reserved in their vocalizations than some others did, but even these participants spoke from time to time, and when silent these participants remained attentive and involved in the discussion.

When the system was activated, all participants produced feedback on their assigned "buddy's" role in the discussion. The discussion remained lively and amicable, but it became noticeable that the participants became more absolute in their opinions on the topic set and less willing to compromise, sticking more to initial opinions. They were now less likely to accept the opinion of someone else, which led to the differences in opinion becoming more visible. This change in behavior within the group, accounted for by the *breaching aspect* within the session. In this session the experimental situation resulted in more, in depth argumentative discussion of the topic, than before. Furthermore, the behavioral

change within the group meant that the position of participants, that were less vocal but more observational, in the discussion was strengthened. There were a couple of participants who took the central role in both discussions by being the most vocal, and when TiC was activated, these participants were in frequent disagreement with each other on the discussed topic.

#### 5.4 *Description and data from session two*

The participants of session 2 consisted of HBO (Dutch polytechnic) students, some of which had graduated and some had not. Most of the group's members were acquainted for they attended courses at the same college. Probably due to this familiarity, the group demonstrated a more nonchalant/social group dynamic; they shared their opinions openly, whether or not the participants agreed or disagreed, views were vocalized. Although the participants were quite knowledgeable on the topics discussed, their opinions and interactions were not as nuanced as the participants of the first session, leading to a slightly chaotic and loud session. This group was younger than the first group; the age ranging from 22 to 28.

From the collected data from session 2, one observes that in this session initially there was a more formalistic form of discussion. One person was assigned to lead and each participant was then, in turn, given a chance to respond, although as soon as the initial introductions and statements were made, the group responses became less formalistic and more personally orientated. Interaction within the group was quite fluid, although the group had a reasonable amount of interruptions, which led to participants giving up on contributing, due to the fact that they were not vocal enough to be able to grab the group's attention. When the system was activated, the already weak leadership position within the discussion became even more difficult to maintain, for the participants became less interested in waiting for the opportune/polite moment to respond, and were keener on loudly interrupting, on a frequent basis. With the result that the discussion became uncontrollable and semi-chaotic, where who spoke loudest was who was heard, although several participants tried to gain control but were not successful in doing so. The increase of uncontrollability within the group behavior demonstrates the *breaching aspect* occurring within this session. Implicit differences in opinions were made explicitly visible, where earlier they had not been evident. On rare occasions, the vocal interruptions were seen as such a nuisance that the participants felt strengthened to react 'en mass'. The visualized feedback to the interrupting participant clearly mirrored the group's discontent, leading to the participant who had been adamantly interrupting being told-off.

#### 5.5 *Description and data from session three*

Session 3 consisted of participants who were all above the age 35 and up to the age of 70. Although not all of the participants held a university degree, they were all professionals and had years of experience in their respective fields of business, academia and/or art. The participants of this session possessed a developed sense of morals, similar to that of the participants from session one.

But the participants in this group were far more cynical and pessimistic in their views, which led to the expression of strongly opposing opinions leading to hefty discussions. In this group, the participants were far less willing to modify their point of view, mainly due to the fact that they seem to have felt a much stronger personal investment in the topic being discussed.

In session 3, the discussion without the system activated was intense; one participant felt a strong personal connection to the topic and therefore was quite adamant and opinionated. The attempt by some participants to present a more balanced point of view on the topic was unsuccessful. And thus the topic shifted from the initial theme to a more general version of the topic. The discussion was very lively, with several opposing opinions being shared and discussed. The group as a whole kept track of who participated more and who participated less, and this was verbally made explicit at several occasions when the quiet participants were asked to contribute, in order to prompt a response from the participants who were mainly quiet. This produced mixed results. Eventually the experimenter had to intervene in the first discussion due to time constraints.

Afterwards, the system was activated, and the new topic was introduced. To the surprise of the experimenter, the second discussion was stale; there was none of the previous exuberance of activity within the group. It became apparent that the participants were not abiding to the instructions, and that they were in fact refusing to use the foot pedals to display the feedback. Even though vocally feedback was still occurring, although at a far diminished strength than during the previous discussion. Several participants noticed the reluctance to use the system to give feedback and consequently on occasion these participants started to demand response from within the group, this, however, was not adhered to. The development of an extreme difference between the first and second portions of discussion in liveliness, and the strong reluctance to participate, reflects breaching having taken place.

The sudden change in participation could be explained in several ways; the first would be, that the participants did not understand the parameters and tasks of the experiment. Or that the idea of being critically observed and judged was too much of a social risk for them, and therefore the participants were not willing to be openly critical in their observations and judgments of the other participants. The idea that the participants did not understand the set tasks is unlikely. The reluctance in participation led to the discussion coming to an early end, when during the second topic the minimum time was reached, the group announced that the discussion was finished.

### *5.6 Observations*

In this experiment three different breaching behaviors were produced:

1. In session 1 breaching produced creative animated interaction with participants becoming more vigorous in their communication;
2. In session 2 breaching was voiced in hyper activeness; that is, impatience that led to increased interruptions;
3. In session 3 breaching was expressed through passive aggressiveness and the refusal to participate.

## 6 Discussion and conclusion

Reflecting back to questions stated in the Introduction:

- Will intense evaluative feedback act as an inhibitor leading to stultified conversation and/or encourage participants to speak out?

The answer is that both results occurred. In the three TiC sessions that were conducted there were instances of both inhibiting and encouraging behavior; in session 1 and 2 participants became more vocally active when the system was active, and in session 3 activation of the system clearly had an inhibiting factor on participation with the effect that the discussion was halted as soon as was possible.

- Will participants be aware of how they feel during the TiC session and/or how they are being rewarded?

The answer is: No. Neither in the collected data, nor in any of the post session interviews was there any mention or visible/audible evidence that the experiment had a reflexive emotional effect on the participants or that the way, which they were aware of how they had been rewarded or punished during the TiC session, had a strong emotive effect on them.

- Would a group norm be established or will individualized behavior result?

Group norms were definitely established and individualized behavior also occurred. In session 1 the group norm resulted in lively animated discussion. Participants from session 2 banded together in order to respond to participants' disruptive interruptions. In session 3, the participants held strongly to their individual opinions, but since this was the reaction of all of the participants, it was paradoxically the group norm.

- Will the disruption produced through TiC lead more to anarchy or to control?

From the three sessions there is no evidence that the disruption lead to anarchy, it did lead to animated discussion, and it made differences in opinion visible. There was divisiveness but no anarchy. TiC did lead to more control, which was most evident in group 3, where the participants controlled the direction of the discussion by their "refusal to participate".

- Is this type of disruption liberating, as the experimenters of *Reflect*[2,3,4], *Lego Serious Play*[5-12] and *Simulation*[13-19, 27] referred to and assumed, or is that assumption questionable?

No evidence was produced by TiC suggesting that the breaching disruption created a liberating effect on the group(s).

### 6.1 General implications

TiC is in fact a very simple setup. Within the system there is no internal analysis going on; meaning that there is no computer algorithm listening to the participants and playing with the feedback, which if done could have produced the breaching effect. Instead what TiC does is that it sits there, asking the participants to use it to produce critical feedback in a social situation; to make the implicit explicit, where doing so is generally not beneficial; instigating the breaching effect. The fact that a simple system allows breaching to occur, and

having succeeded in producing interesting/unexpected/diverse results in three short sessions calls for the numerous "What if...?" questions to come to mind. This demonstrates that there are possibilities to do so much more within this field of study.

This is why I do not see TiC as being a completed/finalized study. For the data produced shows that TiC is only scratching the surface of possibilities. Thus provided enough to merit further study.

In short: TiC is a social technological experiment that falls between an interactive art installation and a social psychological breaching experiment, it is an explorative research experiment. TiC can and should be used as a stepping-stone for further studies on the interaction space between subjects in relationship to other subjects engulfed in a technological dependent society. Hereby, New Media studies can attempt to integrate research into new technologies with that of social studies.

Human Computer Interaction, for instance, has studied psychological reaction to technology. Contrastingly TiC uses new (media) technology to study human sociability. Contemporary society is saturated with (new) media technologies; TiC is appropriate to such a society characterized by many communication technologies, wherein technology is a normal part of one's life. Nonetheless, TiC is a fairly new sort of technology-social intermix.

Defining research steps in such exploratory investigation was challenging. I have examined and justified examining TiC via the social studies of breaching experiments, but it could be approached via everything from experimental psychology to art appreciation. The use of this experiment, interpreted as I have, is to take a step to integrate new media studies with social studies. Since communication increasingly takes place via new media, and familiarity with new media has increased enormously during the last years, the integration of the social studies of communication and of new media studies is surely a theme for our times. New media research, indeed, is a contemporary challenge. Surely more tics will follow.

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## Published References

- [1] Garfinkel, H. (1984) *Studies in Ethnomethodology*. Polity Press. Cambridge, UK.
- [2] Bachour, Khaled, Frédéric Kaplan, and Pierre Dillenbourg. "Reflect: An Interactive Table for Regulating Face-to-Face Collaborative Learning." *Times of Convergence. Technologies Across Learning Contexts*. Springer Berlin Heidelberg, 2008. 39-48.
- [3] Bachour, K. (2010). Doctoral Dissertation: Augmenting Face-to-Face Collaboration with Low-Resolution Semi-Ambient Feedback. *École Polytechnique Fédérale de Lausanne*.
- [4] Kaplan, F. (2012) *La Metamorphose des Objets*; Seconde Edition. Partie II-4, La table qui écoute les conversations. *Fyp Éditions*.
- [6] Roos, J. & Victor, B. (1999) Towards a New Model of Strategy-making as Serious Play, *European Management Journal* Vol. 17, No 4, p. 348-355
- [7] Statler, M. & Roos, J. (2002). A Place to Play: Innovating the Practice of Strategy Research Working Paper 18. Imagination Lab.
- [8] Statler, M., Roos, J. & Victor, B. (2009). Ain't Misbehavin': Taking Play Seriously in Organizations. *Journal of Change Management*, 9(1), 21-21.
- [11] Said, R., Roos, J., & Statler, M. (2001). LEGO Speaks. Working Paper 20. Imagination Lab.
- [20] Ed. Wetherall, M., Taylor, S. & Yates, S.J. (2001) Goffman, Garfinkel and Conversation Analysis; John Heritage. *London: Sage, Discourse Theory and Practice*, p.48-57
- [21] Henri, F. (1992). Computer Conferencing and Content Analysis. In A.R. Kaye (Ed). *Collaborative Learning Through Computer Conferencing: The Najaden Papers*, 117-136. Berlin: Springer-Verlag.
- [23] Barros, F.A., Gonçalves, P.F. & Santos, T.L.V.L. (1998) Providing Context to Web Searches: The Use of Ontologies to Enhance Search Engine's Accuracy. *J. Braz. Comp. Soc. vol. 5 n.2, Campinas*
- [24] Bales, R. F. (1958). Task Roles and Social Roles in Problem-solving Groups. Eds. Maccoby, E.E., Newcomb, T. M., & Hartley, E. L., *Social Psychology* (3rd ed., pp.437-447). New York: Holt, Rinehart, & Winston
- [26] Eds. Harel, I. and Papert, S. (1991), *Constructionism*, Ablex Publishing Corporation, Piaget, Norwood, NJ.
- [27] Mairesse, P., PRs. Letiche, H., Moriceau, J-L, Toma, Y., (Forth coming Nov. 2014). Doctoral Dissertation: Reversal. Le Partage de la Parole comme Expérience Sensible, Esthétique, et Politique. *Universiteit voor Humanistiek, Utrecht – Humanization of Organisations and Université de Paris I Panthéon Sorbonne - Arts Plastiques et Sciences de l'art, Paris*

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## Online References

- [5] "Lego Serious Play". <http://www.seriousplay.com/>, viewed June 2013.
- [9] "Session Managerial Learning". <http://youtu.be/PcMFVt28XhI>, viewed June 2013.
- [10] "Explanation Educational Learning". <http://youtu.be/2TbTa31ACB4>, viewed June 2013.

- [12] "Imagination Lab". [http://www.imagilab.org/research\\_nextpractice.htm](http://www.imagilab.org/research_nextpractice.htm), viewed June 2013.
- [13] "Simulation". <http://lo-raguet.com/simulation.html>, viewed June 2013.
- [14] "Simulation". <http://iaeparis.tumblr.com/post/19050850452/simulation-a-research-plan-by-philippe>, viewed June 2013.
- [15] "Simulation". <http://vimeo.com/57092693>, viewed June 2013.
- [16] Mairesse, P. <http://art-flux.univ-paris1.fr/spip.php?article418>, viewed June 2013.
- [19] "Making Sense Colloquium". <http://makingsensecolloquium.com/archives/>, viewed June 2013.
- [25] Belbin, M. "Dr. Meredith Belbin." <http://www.belbin.com/rte.asp?id=5>, viewed July 2014.

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#### **Private Communications & Interactions**

- [17] Private communications between Letiche, T. and Mairesse, P. (May 2013)
- [18] Letiche, T. Participation in Making Sense: Aesthetic Theory and Art Practice, *The Centre Pompidou and Institut Télécom, Paris*. (Oct 2010)
- [22] Private communication between Letiche, T. and Lissack, M 'Modes of Explanation' Conference, Paris. (June 2013)