

# Tassophonics: Nanotechnology as the Magical Unknown

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**Abstract.** This paper outlines a set of experiments designed to explore how we can embed memories in objects augmented with non-discernable nanotechnological interfaces. It explores whether the object can successfully embody a wish or fear and how the participant experiences living with a physical reminder of these secrets. As such the experiments draw on more traditional paper-prototyping and body-storming techniques. The goal is to assess if the introduction of nanotechnology as a magical unknown can be used to seed and affect our relationships to objects and archived memories.

**Keywords:** Magical unknown, Nanotechnology, probe, secret, desire, archaeoacoustics, archive, performative consultation.

“The objects which surround us do not simply have utilitarian aspects; rather they serve as a kind of mirror which reflects our own image.”

-Ernest Dichter in *The Strategy of Desire*.

## 1 Introduction

*Tassophonics* investigates different techniques of embedding information and emotive attachment onto an object and the ability of that object to continue to hold on to this meaning over time. In order to do this we introduce nanotechnology as what we term a *magical unknown*, which allows us to imagine new possibilities for a recognizable object. New technologies can often be perceived as magic, or even haunted, because we do not understand how they work [1]. With technologies shrinking to become only barely visible, or invisible, their function is now largely ‘believed’ or assumed by the uninitiated rather than observed. As a consequence these technological advances and the science they implicate require a certain suspension of disbelief from the layman, a reframing of perception in the spirit of Hayes’ naive physics [2]. The *Tassophonics* project makes active use of this suspension of disbelief to introduce the potential for an everyday object to hold and embody a secret and to signify the secret’s underlying fear and desire.

The experiment reported in this paper takes the form of performative consultations that probe the participant's feelings towards nanotechnology and imagine ways in which data can be embedded into a physical vessel in the form of a porcelain cup. Semi structured interviews were conducted with sixteen university students and followed up via sms messaging over the course of five days. During the interview we invite the interviewee to consider a personal wish or regret and draw it as a private symbol onto a porcelain cup. The symbol *represents* the embedding of the secret and serves as a reminder of that secret. A stranger may drink from the cup not knowing what the symbol refers to. As such the cup can be imagined as the holder of both emotional and technological secrets.

The experiment was inspired by well-established user research methods such as the Cultural Probes [3] and the Placebo Project [4] as well as the experimental theatre work of Boal [5] and the art practice of estrangement as described by Shklovsky [6]. The content choices deliberately reference the myth of archaeoacoustics [7],[8], gift exchange [9], and the role of souvenirs [10], with regard to the potential for mapping fears and desires onto objects.

The aim of the project is to ask questions that address the underlying drivers such as fear and desire as well as consider the overall emotional impact of a secret being made visible, and external to the subject, but encoded and unreadable in the form of a symbol. How does the secret embodied by the object change the relationship towards that object itself? Does it affect the wish or fear expressed? How does the extended interaction with the object affect the participant's experience? We attempt to map how the experimental techniques affect our relationship to the object, the secret, and the level of intimacy that can develop from such an encounter. If indeed, as Jean Baudrillard postulated in *The System of Objects*, an "object's function is the mediation of a wish... the voice of desire",<sup>1</sup> then, could an object also hold the inherent fear and desire of the technological unknown, in this case, nanotechnology?

This paper explicates the notion of the technological unknown, the concepts that frame the project: the relationship between desire and objects and the power of the myth in creating a relationship to that object. We then describe the sets of experiments that were conducted, the data we collected and offer an analysis. Finally we suggest some conclusions and directions for future iterations of the project.

## 2 The Technological Unknown

New technologies have considerable magical potential until they become commonplace and well understood. Nikola Tesla understood this phenomenon very well and acted the part of a magician when he made his demonstrations of 'electricity' at fairs [11]. The intent was to present the raw and awe inspiring power of electricity as a tamable magic trick, so that it would not be seen as an unnatural development that messed with God's natural order (rather than for example a fairly non-dangerous technology that could bring light to all homes). The fear of the unknown can lead to perceiving new technologies as an abomination, and often the simplifications offered

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<sup>1</sup> Jean Baudrillard. *The System of Objects*. J. Benedict (Trans). Verso Books, London and New York 1996 (1968) p.97.

can take the form of a de facto ‘against’ position towards the technology itself. This uncritical stance shuts out the possibility of imagining not only the future implementation of the technology but also the boundaries and conditions of that implementation. In contemporary culture, bio art often skirts this taboo terrain of the ‘culturally unacceptable’ in order to incite reflection upon emerging biotech practices. Critical Art Ensemble (CAE)[12], a group working with bioart interventions, sets up temporary labs inviting non-scientists to enter the space of the laboratory, to familiarize themselves with its tools and terminology to make simple experiments, effectively demystifying new advancements in the biotech industry. These artists present themselves as scientists, just like Tesla played the magician, to build a contextual narrative that can frame the participant’s perspective of the *technological unknown*. Such experiences creates a space in which partial technical understanding, scientific wonder, (dis)belief and sometimes fear allow us to probe how a new technology embodies our fears and desires. The *Tassophonics* project was created to investigate these questions specifically with regards to nanotechnology.

What are our feelings towards this barely perceptible and largely unknown technology? We cannot see how it works, so how do we really understand what it does? Nanotechnology is commonly discussed as having potential applications as diverse as the miniaturization of electronics, the development of strong new building materials, medical implants, targeted drug delivery and tissue engineering. It seems that nanotechnological elements will eventually become part of our bodies. How do we imagine this experience, and what are our feelings towards it? Rather than asking this question directly *Tassophonics* contextualizes it by introducing it in the form of a questionnaire and then inviting the participants to engage in an experiment designing to probe their emotional response to a suggested nanotechnological object. We then explore if this context amplifies or influences the participant’s relationship to the object. For example, could a fundamental mistrust in nanotechnology transform the relationship to the object, to one based on fear?

**Desire and Objects:** Our desires are situated in objects, or rather, objects can be seen to point to our desires. They evoke emotion in relation to the desire we map to them. In *The System of Objects*, Baudrillard argues that we construct the/our world through objects [13]. He defines ‘objects’ as only those that are abstracted from their function. These everyday objects transcend functionality and become property and passion, echoing the consciousness of the owner. The object’s function becomes the mediation of a wish, the voice of desire. *Tassophonics* deliberately makes use of an everyday ‘functional’ object, the teacup, as object. We investigate if the object can become ‘an object of passion’ through the ritual of embedding a secret or wish onto the cup through the invocation of imaginary nanotechnology.

**The Power of the Myth:** The overall project is executed in the cultural context of the myths of archaeoacoustics, the rituals of formal gift exchange, the meaning attribution of souvenirs, and the broader fundamental potential for mapping fears/desires onto objects. In *The Strategy of Desire* Ernest Dichter argues that emotional attachment is strongly linked to old myths [14]. In this experiment we use the myth of archaeoacoustics to trigger a ‘belief’ that the object could indeed record sound through

nanotechnology. Archaeoacoustics refers to the myth of ambient sound being accidentally recorded in the grooves of ancient pottery. The idea being that the clay might hold the soundtrack of the past, like a piece of vinyl imprinted by a phonograph [7], [8]. Simultaneously, the cup in the experiment functions like a souvenir as described by Susan Stewart in *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection* [10]. It is a mass produced object that only becomes meaningful when *activated* through an embodied experience. In that sense it serves as a physical bookmark, deliberately acquired and kept as a way to *remember this moment*. The cup is *activated* in a similar way through the experimental experience which can be said to exploit the mechanics of gift exchange as described by Marcel Mauss in *The Gift* [9]. We give the cup to the participant and they are then potentially bound by the ritual of this exchange to continue in their relationship with the experiment.

### 3 Experiment Setup

The experiment is constructed as a contextually situated interview followed by a five day long embedded experience where the users are probed with a daily question via text messaging. The experiment itself runs through five stages: recruitment, baseline questionnaire, recording and encoding of message, embedded probe, and transition and closure.

**Recruitment:** The experimenters wear lab coats and are holding clipboards (holding the interview questionnaire). They recruit potential participants as they walk out of the City University of Hong Kong campus. The experimenters approach walkers-by by asking if they would like to participate in an experiment about nanotechnology.

**Baseline Questionnaire:** An interview is conducted with each participant. They are asked the following questions:

- What do you study?
- Have you ever heard of nanotechnology?
- Do you know what nanotechnology is?
- Can you explain what you think it is?
- Do you think nanotechnology is ‘good’ or something to be feared?
- How do you think you could use nanotech?
- Do you think nanotechnology can keep a secret forever?

The last question is meant to probe how permanent or secure the participant feels nanotechnology is, or in what capacity could it serve as an archiving tool. Nanotechnology is not usually referred to in this manner. In asking this question that invokes the secret, we both stretch the usual boundaries of perceived uses of nanotechnology and make a bridge to the following phase of the experiment.

**Recording and Encoding of Message:** Participants are asked to close their eyes and think of a wish or regret. Once they have thought of it, they open their eyes. They are handed a small teacup and an indelible marker and then asked to draw a secret symbol representing that wish or regret onto the cup (a symbol that only they would recognize).

**Embedded Probe:** A photo is taken of the participant with her/his cup. They are then asked if they wish to participate in the second part of the experiment in which participants are prompted every day for five days about how they feel about the cup. If they agree, contact details are exchanged and the participants are told that the cup is theirs to keep for the next five days. During this phase, ‘living with the cup’, the following questions are asked:

**Day 1:** Drink from the cup. How does it feel? Will it make you strong or weak?

**Day 2:** Look at the cup in your kitchen. What do you think when you look at it?

**Day 3:** Serve a drink from the cup to someone else. How does that make you feel?

**Day 4:** Do you feel you have to hide the cup? Do you hate it? Do you love it?

**Day 5:** a) You must now say goodbye to the cup. You can give it away or you can destroy it. Send us a picture of your choice. b) How do you feel now?

All questions were sent in both Cantonese and English, here for simplification, only the English version is included.

**Transition and Closure:** On the fifth day, participants are given two options on how to end the process. They can either give the cup away, or destroy it. They are asked to send documentation of their choice. We surveyed 21 people in total. The experiment was divided into two selection groups. The first experiment was conducted outside a university campus in Hong Kong with 16 out of the 21 participants. The latter were mainly studying at the Bachelor level in a range of fields (except one MA and one PhD student). The age group was 18-22 with the exception of the PhD student who was 31. The second group was surveyed in a street market famous for its cheap electronics, as well as being the birthplace of bootlegs, Sham Shui Po (a district of Hong Kong). It was much more difficult to find willing participants in the latter context. We interviewed five people with varying backgrounds and ages. None of these participants made it to stage five (transition and closure), we therefore chose to only consider their answers to the baseline questionnaire. As a result, we consider 16 as our base number of participants in the second part of the experiment ‘living with the cup’. It is worth mentioning that in the first group from the university, those conducting the experiment were wearing lab coats. In the second group, we began with the lab coats, and later dropped the idea fearing it lowered our chances to find participants as the area is known for bootlegs and might not respond well to the authority of the lab coat. Though that proved inconclusive because not using the lab coats did not end up increasing the number of participants.

## 4 Data Collected

### 4.1 Baseline Interview

1. Everyone had heard of nanotechnology
2. Most participants could cite an example of how nanotechnology was used and were uncritical about its potential uses.
3. Most participants also imagined very practical and existing ways of using the technology when asked what it *could* be used for.

4. When asked if they thought if the technology could ‘keep a secret forever’, the answers were more divided. Little less than half said yes, around half said no, and a small portion was undecided.

The baseline interview was largely conducted to set the stage for the second part of the experiment, ‘living with the cup’. By framing the discussion around nanotechnology, the participant can imagine what it could be like if there were nanotechnology, such as a miniaturized electro-mechanical recording/storage device, embedded in the cup by the time it is given to them. Therefore, the collection of data in the questionnaire is almost incidental and though it says something about participants’ exposure to the subject of nanotechnology, and their reaction towards it, we will not discuss the data any further, as the focus of this experiment is on the embedded probe, and the transition and closure phases. The following are a selection of images taken of the participants holding their cup showing the symbol they drew on it.



**Fig. 1.** A participant holding their cup, showing the symbol they drew. The symbol is abstract

**Fig. 2.** A participant holding their cup, showing the symbol they drew. The symbol resembles a sound wave

Some participants drew representational symbols such as a robot, others abstract shapes or line strokes, and the later could be said to resemble a sound wave, a representation of the whispered secret?

## 4.2 ‘Living with the Cup’

Ten out of sixteen participants answered question one of ‘living with the cup’. Five out of sixteen answered up to and including question four (on day 4). Three documentation pieces were sent back to us as a final answer to question five (on day 5, two images and one video).

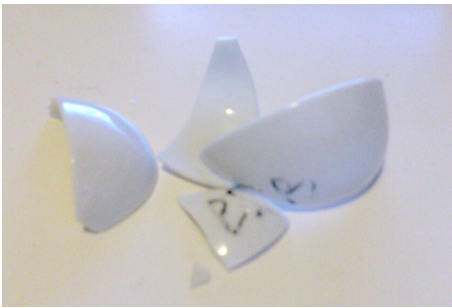
**Day 1:** Half the participants reported it either makes them feel strong, weak, or mysterious. The other half reported ‘no feeling’ or ‘nothing special’ after drinking from the cup.

**Day 2:** Three people mentioned the secret. Out of the 8 who answered this question, 5 participants thought of the cup as a metaphor or as some sort of representation of their secret.

**Day 3:** Six people felt differently than they would have serving tea from a random cup (e.g. “quite weird”, “awkward yet amused”). One participant reported that he thought the person he served the cup to would know his secret by drinking out of the cup (“I thought he would know my secret”). 7 people answered this question.

**Day 4:** Two people felt like they should hide the cup. One person answered that they had no special feeling towards it. The others reported that they do not want to hide it.

**Day 5:** Only four of the participants answered this question. One participant was totally shocked by the thought of parting with the cup. He first answered: “really?! no!! i really like the cup! i put it on my bookshelf and i think it is really delicate and beautiful!”. When he was told he *must* either destroy or give it away, he answered: “oh my god!” and never sent a photo of his choice nor a response. The three others chose to destroy the cup, two by smashing it (see figure x and y), and the third by attempting to burn the cup until it broke (he sent video documentation of this process). After having destroyed their cups, the participants reported relief, sadness, a sense of loss, and “stimulation”.



**Fig. 3.** An image sent by one of the participants in response to the last question. The participant reports feeling: “a tad sense of loss” after smashing the cup.



**Fig. 4.** An image sent by one of the participants in response to the last question. The participant reports feeling: “Kind of... relieved xd but feel sad for the cup (sic)” after smashing the cup.

## 5 Analysis

To our surprise, 6 out of the 8 participants who answered beyond day 1 of ‘living with the cup’ had an overall emotional response to the cup. We did not expect such a high response. The responses of many of the participants seem to indicate that they imagine a secret is embedded in the cup. Moreover, they feel that this object can even have an effect on them, such as making them strong or weak. The object becomes symbolic of their wish or regret in some cases, and in others it is endowed with magical powers. Sometimes this is expressed literally: “It’s like a magic gobbet (sic)” and others metaphorically such as: “i feel cool and stronger... (sic)” or “I feel weak and relaxed after drinking”. One respondent reports that making others drink from the cup makes him feel: “Warm, kind and take care of other people’s happiness”. Some

participants think of the cup as a metaphor of their secret, or an embodiment of it. The fact that some feel that the cup should be hidden, for fear of divulging the secret, possibly also relates to the cup embodying their wish or desire, therefore having to hide it to effectively hide the secret. It also could indicate a lack of belief in the capacity of the technology to keep a secret. This could be related to a perceived weakness in 'digital security' for example. Those that felt that they have to hide the cup answered differently to the baseline questionnaire section asking if they think nanotechnology can keep a secret forever. It is therefore impossible to make a correlation on that level at this stage. The sense of relief, sadness or loss reported by the participants after destroying the cup might suggest that they feel that they are parting with the secret, or that the object has successfully been embedded with meaning. It certainly indicates that the cup is no longer trivial to them. The cup has become special through the experience of the experiment. It is important to note that not all responses support this theory, many answered: "no feeling" and not all respondents had an emotional response to the cup. To some it remained a purely functional object, a cup to serve tea in, with no special meaning whatsoever. It is interesting that the three respondents that sent an image back to us chose to destroy the cup (either by smashing it or by burning it), rather than giving it away. This might signify that they imagined giving the cup to someone would be like giving away their secret. Perhaps by destroying the cup they would rid themselves of the commitment to that secret or wish. At this stage no follow up questions were designed in the experiment. Therefore any conclusions would be purely speculative. Future experiments should be designed to probe the significance of the destruction of the object for the user in relation to their secret wish or regret.

## 6 Some Conclusions and Directions for Future Work

*Tassophonics* is meant to be understood as the first step towards an experimental method to explore the relationships between memory/object, emotion/object and technology/object. Our findings are modest and are meant as an initial test, to see whether there is anything interesting to further explore, and if so in what direction. We feel that this initial iteration of the *Tassophonics* experiment was successful in creating, and providing evidence for, an emotional connection between the object and the participant. Some results were quite compelling with regards to levels of attachment, projection and embodiment. We set out to explore the emotional value of a secret being made visible but 'unreadable'. We posit that as the secret is imagined and made visible and physical onto an object exterior to the self, it can be contemplated, manipulated or even destroyed. This suggests that we can use future experiments to explore not only the specifics of nanotechnology, but more broadly the manipulation of memory and security of data in technological objects. In this regard, the documentation sent by the participants was particularly poignant; the broken shards in combination with comments about their relief and sadness at its destruction. One of the goals of the *Tassophonics* experiment was to assess how nanotechnology as a *magical unknown* affects our relationships to objects and archived memories.



As all of the participants that took part in the ‘living with the cup’ phase had positive (and mostly uncritical) perception of nanotechnology, it is impossible to assess whether that positive feeling affected their relationship with the cup as we have no negative cases to compare with. Had they feared the technology, would they have also feared the cup? With the set of questions posed, we are also not able to assess whether it was the experiment’s framing with nanotechnology, or the symbols drawn on the cup that are responsible for creating the emotional response to the cup. Would it have been the same had we talked about another *sufficiently advanced* [1] technology? How would it have been different had the technology really been embedded in the cup? Also, since we did not ask the respondents to reveal their secret, it is difficult to assess how the symbol they drew on the cup relates to it, and its importance as a symbol. In this iteration of *Tassophonics* we used nanotechnology as a *magical unknown* to explore the participant’s engagement with the object. In future iterations of the project we will deepen our investigation of this engagement by making our method and questions more precise. We will conduct the re-designed experiment again but this time with a much broader range of age and cultural backgrounds. The main project remains to unpick the influences of the suggestion of the technology and its potential power as a *magical unknown*. We believe that the *Tassophonics* project seen in context with our broader body of work, the OWL project [15], the Magic Machine Workshops [16] and threads/ [17], can mature to become a new type of user investigation with wide implications for the HCI community. The work to design scenarios-of-use, interfaces and experiences in the age of the disappearing computer must increasingly rely on matters of emotional responses and systems of belief as we are given less physical constraints and technically dictated specifications. It should be noted that these methods are not primarily designed to brainstorm new developments of the scientific base of these new technologies themselves, but rather to develop experiences and use-cases that allow users to access and co-design the ways that a technology might manifest in their everyday life. By exploring the use of a technology as a *magical unknown* to seed and incite the user’s imagination (or creative thinking about potential/future uses) we might not only be able to begin to democratize the creation of ethical and cultural responses to new technologies, but ultimately be creating tools to generate the user scenarios and experiences of the objects these technologies may bring.

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