

Designing for New Photographic Experiences: How the Lomographic Practice Informed Context Photography

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Abstract. This paper reports on how we learned from an *alternative practice* in order to design engaging interactive technology intended for a more general user group. When investigating new types of digital photography we designed *context photography*, where real-time context data visually affects digital pictures as they are taken. To understand how to design for a meaningful photographic experience, we took inspiration from an amateur practice involving a particular type of analogue camera – *Lomography*. This paper shows how such alternative or marginal practices can help to ground design of interactive technology in existing human interests, while at the same time leading to a novel design outcome.

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1 Introduction

Interactive technology is becoming more and more pervasive in peoples' everyday lives, thus creating opportunities for new creative everyday practices to emerge. For example, digital photography can give raise to new and alternative creative practices, and support a variety of different interests in picture-taking. However, it is challenging to design interactive technology that goes beyond what already exists, and to extend existing experiences into entirely new ones. For this purpose, it can be useful to reach beyond the more general needs and interests that users can provide insight about. One way to trigger innovative design is to learn about the special needs of *lead users* [21]. Lead users are highly creative users of a specific product, and even if they are different from the average user, their creative use can guide the design to support future needs in a more general group. However, as lead users usually are inventive users of already existing products, such approach is not suitable when working with research prototypes or technology that is not yet mature.

We aim to explore possible experiences of technology that does not yet exist with the help of an *alternative* or *marginal* human practice. By learning about experiences from specific individuals practices, rather than the average user, we hope to design for a novel yet meaningful experience. The process involves learning about subjective and experienced qualities that make an existing practice *meaningful*, and transfer

these to a different context - to the intended design outcome and the technology it will involve.

Context photography is a project that deliberately tries to break away from preconceptions of photography, and introduces new photographic parameters to the user. We wanted to design for an everyday photographic practice for amateur photographers, and to advantage of the untapped potential of digital technology. Previously, we have described the design process [14] and results from an exploratory study [9] from a more general perspective. In this paper we will in particular shed light on how we learned from a specific group of dedicated amateur photographers – *lomographers*, who use old analogue cameras with optical defects as an everyday photographic practice [15]. We never intended the lomographers as end-users of the final design, but we took advantage of their alternative perspective on photography in order to design for an alternative digital photography experience.

2 Background

Despite the fundamental change from analogue to digital cameras, not much has happened to the creative *picture-taking moment* for the average photographer. Even if novel technical properties (such as the digital format, and the possibility to directly view taken pictures) have changed the picture-taking, digital camera technology still has much unexplored potential as a creative practice. So far, studies of users have investigated which type of pictures are currently taken with digital devices such as camera phones [20], and how these are managed and shared [12]. More design-oriented research projects have investigated novel ways of editing, consuming or sharing the taken pictures – for example, pictures have been augmented with audio recordings [5, 1]. Other efforts have involved mobile and simplified annotation of pictures [3]. Sensor-based metadata, such as GPS (Geographic Positioning System), is already saved with the picture in some consumer products (e.g. in Samsung SGH-E760). However, such metadata could be used for much more than providing geographic location of where a picture was taken, beyond merely constituting saved information from the moment of capture. A more active use of sensors is found in the field of ubiquitous computing, where sensor values more obviously can affect the user experience, for example in museum environments [8]. Automatic capture of pictures to generate diary data could represent a novel approach in the moment of picture taking. However, rather than being explored as a creative practice, this has primarily been investigated as an automatic wearable system for documenting the everyday, e.g. to support memory [6]. Instead, context photography aims to explore photography as a *creative practice*, and more specifically investigating novel experiences in *the moment of taking a picture*.

This paper aims to contribute to a holistic view of use, namely to design for *experiences*. Some researchers have a functional perspective of experience, suggesting that it is possible to classify it as a predictable behavior [17]. Others, including us, consider experience to be contextualized, highly personal and actively constructed, implying a more holistic relationship between the user and the artifact [16]. From this perspective, the users themselves create meaning, and as a designer

you can only learn when and why *meaningful experiences* arises and try design for them to happen [4]. In a similar manner, designing for *aesthetic experiences* involves inviting people to be active in creating sense and meaning [7]. Such a perspective of design could also involve making users or other individuals reflect on their experiences, in order to find specific *qualities* that can describe aspects affecting a meaningful experience. Such qualities can then be considered as a foundation for design. This is our approach, aiming to understand, build and design upon and for meaningful experiences. Related approaches of experience-centered design, involves to put the designers into the shoes of the users. In experience prototyping [2] *bodystorming* is used to understand and bodily engage in the user's situation. Another technique involves to touch upon possible diverse experiences, by inviting people with various interests and background for an *unfocus group* to discuss a specific design [11]. In *autobiographical design* [19], designers use their own system as an approach to understand the user's experiences with the system. This paper especially aims to contribute to the field of experience centered design by investigating *how different qualities of existing experiences found in alternative practices, can inform design* for meaningful experiences with interactive technology.

In this paper we will first describe our initial technical and conceptual idea, followed by our exploration of existing types of photography, and how we decided to investigate Lomography. We then outline qualities found in this alternative practice, and how this informed our design of context photography. After this, we describe results from a study where the context camera was used by amateur photographers. Finally we discuss considerations of using alternative or marginal practices in the design process.

3 Designing the Context Camera

When taking a photograph, one can be creative with parameters such as light, speed and focus. But what about letting other parameters influence the image, and view the effects in real-time? Would it be possible to capture something in addition to the visuals of the scenery? Sounds in the background, pollution in the air, smell - can such contextual sensor-based information be reflected in a picture? And if so, could this become a meaningful photographic practice, intended for daily spontaneous use? These were the initial questions and the conceptual starting point, to investigate how to design for novel digital photography experiences.

3.1 Finding a Practice to Guide the Design

In the beginning of the process we explored several sources of inspiration from the field of photography. This involved looking into different kinds of photography, such as artistic pictures pushing the technical borders of photography (for example pictures taken by Billy Name, at the Andy Warhol Factory), various kinds of amateur and professional photography, and other alternative approaches, such as practices involving infrared cameras.



Figure 1. a) Lomographers discussing their interests
b) A lomo-photography in a picture album

Besides reading about photography and study pictures, we wanted to investigate existing personal experiences of photography. We arranged a small exercise for amateur photography students, who were learning to take and develop analogue pictures in an evening class. We wanted to find out about their overall interest in picture taking and understand their views of photography.

Overall, we learned that the photography students preferred to have control during the photo taking and to take carefully planned pictures, succeeding in getting the picture right (in for example during poor light conditions). They all shared a strong interest in the traditional photographic process of taking and developing pictures, and some were openly negative to digital picture taking. This more conservative mindset of photography did not match our interest in exploring alternative experiences and pushing the borders of digital photography. We decided to look elsewhere for people that could provide us with alternative perspectives, and who could be more open-minded to explore novel digital photographic experiences.

When looking into different photographic practices on the Internet, we had come across a practice called Lomography [15]. Lomography is an amateur everyday photography practice, making use of old Russian analogue cameras with optical defects that create unpredictable effects. The lomographers have developed their own photographic practice, with specific aesthetics and rules for how to take pictures. They take spontaneous everyday quick pictures or “snapshots” and they “shoot from the hip”, i.e. avoid looking through the viewfinder when taking a picture. We found ourselves inspired by their creative use of the cameras technical limitations as desirable aesthetic effects. We decided to investigate if Lomography could teach us something about designing for an alternative and engaging practice of photography.

3.2 Workshop with Lomographers

We contacted practitioners of Lomography in Sweden. We found three local ones that were willing to meet up with us to discuss their interest in photography and provide feedback on our initial concept. Our ambition to meet with only three lomographers was not to scientifically define and explain this as a practice. Rather, these individuals were intended to highlight personal experiences that their practice build upon, going beyond existing documentation about the practice. We did not aim to make a digital version of their cameras, but wanted to understand their creative engagement and motivations for being active in such a practice to explore possible qualities of experience that an alternative digital photographic practice could involve.

Whereas the first part of the workshop involved talking about their interests, the second part involved discussing the conceptual starting point of context photography. The lomographers personal pictures (which we had asked them to bring), acted as support to trigger memories about specific photography moments, and intended to enrich the discussion. The workshop participants were the following:

- *Christian*, who studied system design and worked with computer support. He started taking lomo-pictures a few years back, after his father had introduced him to the practice. Before this he used an SLR (System Lens Reflex) camera. Christian carried around a LC-A (Lomo Compact Automat camera) on an everyday basis, but liked to sometimes use other, more plastic types of lomo-cameras.
- *Martin*, who worked at an advertisement agency, and had been introduced to Lomography by Christian. Martin had also tried plastic types of lomographic cameras, but preferred the more original lomo-camera.
- *Anna*, who studied photography at the university, had just recently started with Lomography after finding out about it from Christian. Similarly to Martin, she preferred the original lomo-camera, compared to the more plastic ones.

3.2.1 Qualities found in the Lomographic Practice

Below we present some qualities of subjective experiences, like fun, confusion or other meaningful or memorable moments that the three practitioners of Lomography described. Rather than aiming to provide an extensive overview over the experience, the qualities are intended to highlight aspects of experience that this type of photography can build upon, which also affected our design. The qualities are sorted in the following categories: The Joy of the Unpredictable, Qualities Affecting How Pictures are Taken, and Qualities of Visual Aesthetics.

3.2.1.1 The Joy of the Unpredictable

Anna expressed that one of the reasons she started with lomography was because of the unpredictable results:

[I like] this thing that you don't really know... how the pictures will turn out or so.

Similarly, Martin liked how unexpected technical mistakes in the development process could lead to interesting aesthetics:

It's good if something goes wrong too... It's almost what you are looking for. It's those developments when something strange has happened, that often are the best.

The feeling of not knowing if you took a good or a bad picture, and then open the developed pictures was special. Anna explained that she liked to develop a film that had been sitting in the camera for a long time. Martin agreed, and continued by describing his experience of picking up the developed pictures as:

Well.. you go to the photostore... You open it [the bag with pictures] directly. You don't go home and wait, as they're burning in the bag, right there.

When discussing Lomography in relation to digital photography, the fact that you see the result directly and that no film is developed was considered to take away enjoyment. Martin had used digital cameras in his work but the others did not have much experience of digital photography, and none of them owned one. All expressed that digital photography was useful in work settings, rather than something one would enjoy as a creative practice. Martin expressed how a specific feeling had been taken away in current digital photography, when the resulting pictures did not involve a moment of surprise:

(...) you have to download them to the computer, and then print on a photo paper for example. I feel that you lose the whole feeling then..

We considered these different qualities of *enjoyment of the unpredictable* to be important to consider in our design, especially as the real-time sensor data (such as temperature or sound) we intended to use also could be perceived as unpredictable. When taking pictures in different contexts, ambient sounds might for example vary in intensity and regularity, and thus not be possible to be controlled by the photographer. If such unpredictability could be part of the joy with Lomography, similar qualities might also be enjoyed in context photography.

3.2.1.2 Qualities Affecting How Pictures are Taken

The technical properties of the lomo-camera, are less advanced than modern cameras. The lack of zoom seemed to inspire a certain type of picture taking where the photographer got physically close to take a picture, without looking in the viewfinder (instead shooting from the hip). This approach also resulted in aesthetics that are prominent in Lomography, such as a close-up of a person taken from an askew angle. Christian expressed this as:

I like (...) that (...) you come closer to who or what you are picturing. And then... they aren't always aware either, so it won't result in one of those "where everyone stands at the eiffeltower" or so. And then... if you [don't] capture the whole body, it could turn out bad. But, it could also turn out great (...) Well, it's more fun pictures.

Martin, also appreciated to get physically close, to explore more artistic pictures:

It is easier to make it [deliberately] wrong with the lomo, compared to my other. The one I have, has 30 cm as its closest distance, so I cannot get closer to get everything really blurred, like I want too sometimes. It's really a pain actually... because sometimes you want to shoot something in an extreme close up. With this thing [the lomo] you can simply go ahead and shoot, whenever you feel like it.

Even though the auto focus in Martin's regular camera limited possible artistic explorations, he had been taking pictures similar to those in Lomography, even before he had been introduced to the practice:

(...) it's actually through Christian that I got an opportunity to buy a lomo and I already took a fair amount of those pictures... like snapshots. I have always been doing this type of photography, very much like this book actually [pointing at a book with lomo-pictures] Straight on, without any settings or so, preferably... It should be simple.

This implies that it is not only the technical properties that invites for a certain use of a camera, but also that the photographers interests, preferences and expectations affects how pictures are taken. From this perspective, Anna had an interesting ambiguity in her experience with the lomo-camera. She had initially been attracted to Lomography because of the lack of control that it appeared to involve:

[I like] that it feels like you can't control the camera so much (...) especially, in those [lomo-cameras] where you can't change the settings (...) The only thing you can control then, I guess, is the choice of film.

However, having less control in the picture-taking, turned out to be a challenge. As Anna was used to a more traditional type of photography, she found herself taking lomo-pictures with a more conservative approach, as a way to gain control:

I have noticed... I mean (...) as I have been doing so much regular photography, I'm very much like: "I'll take ten shots of the same thing and change the shutter a little bit or so"... And, I feel this is not really a good thing to do, because then you try to get it [the picture] in a certain way. It's like you think before. And that's not really the point. It should only be these snapshots... but I'm stuck... uh what if I open the shutter a bit more, maybe it will turn out more like this instead?

Thus, a more conservative kind of picture-taking was also possible with the lomo-camera, suggesting that the picture-taking does not only rely on technical properties but also on the photographer preferences, as well as openness and ability to explore a different type of picture taking.

Christian carried his camera with him everywhere, and expressed that the camera had to be easy to carry and simple to take pictures with. He did not like adjusting the camera all the time, but rather wanted to make quick pictures of everyday activities:

(...) I see it a bit more like a diary sometimes, you have it with you, and then you shoot a little, like "here we were having some coffee" (...) That's what I like.

Other types of technical prerequisites that affected use, was for example lack of equipment or how other properties were not suitable for a specific setting. Martin for example, did not have a flash on his current lomo-camera, which restricted his use when it was dark. Further, the possibility of unexpected results made lomography not suited to all kinds of picture-taking situations. Anna and Martin expressed that they would not use the lomo-camera in a situation when they wanted to be absolutely sure of the result. Further, the deficient optics, which give rise to colorful pictures with dark edges, would also inspired a special type picture-taking where such visual aesthetics would be prominent in the result. For example, Christian liked to take pictures of neon signs, and expressed that the camera had a good exposure for such pictures.

Thus, technical properties of the camera highly affect and limits the creative picture taking and sets expectations on the result. Nevertheless, this is also very much in the mind of the photographer and his or her own creative ability and desires. In context photography the choice of sensors and other properties, such as the technical platform, would also be likely affect how and which kind of pictures that are taken.

3.2.1.3 Qualities of Visual Aesthetics

The lack of zoom and autofocus were not the only thing that gave rise to a special type of aesthetics prominent in Lomography. The resulting colorful pictures due to the optical defects, were something that had triggered Anna's desire for Lomography:

I think, I was really attracted by the colors, or so... because so many colors disappear. There is only red, blue and green... and much of the middle-tones disappear too, so I like this very much.

Even if others might not understand or share the same aesthetic preference, Martin expressed that the unusual aesthetics was a reason for enjoying to show the pictures:

Partly because it is so different. And there are many who (...) do not like this at all.. some think like this:" damn how blurry". But, it's a thing in itself, this. That's also why it is fun to show it. Because it is different from the ordinary portraits or whatever it is..

The above implies that the context camera could benefit from having its own particular aesthetics emerging, not only from a specific use of the camera, but also from the technology itself.

3.2.2 Feedback on the Initial Concept

The second part of the workshop was a more design-oriented activity, and involved discussing the concept of context photography. We used pictures of different situations, such as a café setting, and pictures with visual (photoshop) effects to stimulate discussions about what could be sensed in an environment, and how this could be visualized in the pictures. Similarly to their own cameras, the lomographers believed that the camera itself should not be too big physically or technically for daily use. Furthermore, it should be simple and not have too many options or choices, so the control of the sensors should not be overwhelming. They discussed how sensor data could result in pictures that would reflect a special feeling that the photographer experienced when taking the picture: Martin expressed:

If you are in an extreme environment, where everything is affecting [the camera], in the same time... then you have the 10 options that the camera gives. You should be able to take a few away too... until... you're satisfied. Switching off the smoke and the heat [sensors] (...) to achieve the feeling.

They also discussed how their own photos had triggered memories around the picture-taking moment, such as what people had said, and how it smelled and so on:

"You always want to take pictures that show how things were."

They discussed if context photography could involve pushing this further, and make it easier for others to understand the photographer's feelings:

*You look for moods... in a picture.(...) the really good pictures are the ones where you truly feel (...) something, besides the object that you are picturing (...)
You can capture a very excited mood (...) and to get that feeling when you see the picture (...) To find that [feeling] more easy... somehow, maybe that's what you intend to do?*

However, hypothetical visual effects were very difficult to imagine, which Anna pointed out:

I can't really imagine what the effects would look like, I'm just thinking of a blurred image.

Anna then suggested that context photography maybe could involve more “arty” effects, intended to make the picture look aesthetically interesting, rather than aiming to recreate a specific feeling.

The lomographers were concerned with what would happen once the pictures had been taken. They had to be easy to print, or maybe the ones practicing context photography would not be interested in printing the resulting picture, or creating a physical album? They also came up with suggestions for how to create a moment of surprise, similar to how they experienced having pictures “burning in the bag”:

Its fun if you (...) can't see what the picture will be like, and when you download them in the computer, then you'll see if you succeeded, if everything was mapped right, to capture the feeling for that specific moment.

Overall, the workshop gave us insight into possible qualities in the lomographic practice that could be considered also when designing context photography. By understanding qualities relating to the joy of the unpredictable, the personal desires and technical properties affecting how pictures are taken, and the views of aesthetics, we learned about foundations to design a meaningful photography experience. For example, we now would consider how the sensors could provide enjoyable unpredictable qualities and stimulate a specific photographic exploration. Also, we learned how the resulting aesthetics could not only inspire a specific use, but almost symbolize the practice, and what pictures it would involve. Furthermore, we learned that the lomographers were great as experts on their existing practice and their felt experiences, but that discussing design ideas for something not yet existing was not as giving. Especially we found that exploring possible visual effects and combinations with sensor would require another type of expertise.

3.3 Early Prototypes

Based on the implications from the lomographers, we built a first rapid concept prototype, demonstrating the overall concept [9]. This *concept prototype* (Figure 2.b) was implemented on a handheld pocket-pc and allowed manual manipulation of the visual effects. This prototype had very simple visuals; hue, saturation and value, could be manually manipulated before the picture was taken (See example picture in Figure 2a).

We then built an *interaction prototype* (Figure 2c) which incorporated real sensors easy to implement i.e. movement and sound, visually affecting pictures in real-time as they were taken. The visual effects in this prototype were developed together with a graphic designer and artist, who had experience in visual manipulation of video streams. He presented several visual effects that he had previously worked with, from which we chose four to continue working with. This process also included matching them to sensor values, and exploring how to create interesting aesthetics in still pictures without distorting them. We also focused on effects different from regular photography, which could give visual sense of movement and sound. This prototype was implemented on a Tablet PC, with the screen acting as a viewfinder. A webcam



Figure 2 a) Picture taken with the b) concept prototype.
 c) Interaction prototype, and its resulting pictures exemplifying different effects;
 d) 1 pixel-effect. e) 2 colour-effect 2, f) 3 wave+grey-effect, g) 4 zoom+grey-effect

served as a lens, and a small mouse was taped on top of it is used as a trigger. A microphone measured the sound level and movement was retrieved as a vector field from an image stream continuously taken by the webcam. Finally, the interaction prototype had the following effects, which all combined movement and sound:

1. Small white dots follow the movement as a decreasing trace + pixel size increase with sound level (Figure 2.d)
2. Traces of coloured shadows follow the movement + the rest of the colours evolves towards a grey scale with increasing sound level (Figure 2.e)
3. Wave effect + colours evolve towards a grey scale with increasing sound level (Figure 2.f)
4. Extreme zooming on movement + colours evolve towards a grey scale with increasing sound level (Figure 2.g)

3.3.1 Lomographers Testing the Prototypes

We arranged two user workshops to evaluate our concept and get feedback on the picture-taking experience [14]. One of these workshops included two of the lomographers (Christian and Martin). They were trying out the interaction prototype at a train station, taking pictures and then discussing this experience. Below we especially highlight some of their concerns, which were grounded in their experience with lomography and also informed our next prototype.

3.3.1.1 Towards the Joy of the Unpredictable

The lomographers found that it currently was *too easy* to succeed with the pictures taken with the prototype. It created a “*shortcut*”, and they expressed that it felt like “*cheating*” to reach that “*special feeling*” one wishes to capture. In Lomography, such successful pictures could not be planned for. Instead they were happening rarely, or even by mistake. Thus, we needed to make the effects more subtle, and harder to succeed with, to avoid making the photographers bored. The lomographers also suggested that they would rather see the effects *once the picture was captured*, as it would be more exciting and add some surprise in the picture-taking moment, similarly to a lomographer’s excitement when opening his or her developed pictures.

3.3.1.2 Technical Properties Affecting the Picture-taking

Whereas two high school students (and amateur photographers) at another workshop had explored to playfully create sound and movement themselves, the lomographers searched for interesting things in the surroundings to take pictures of. Thus, they seemed to apply their regular way of taking pictures, with the difference of looking for sound and movement. During this, they experienced difficulties with the *default settings of the sensors*, such as the camera's high sensitivity. For instance, they thought that the camera overreacted to their involuntary hand movements when they perceived to be holding it still. They asked for a way for the photographer to have control over how much the sensors affected in the picture-taking moment, also to increase the feeling of being *unique as an artist*. Currently many pictures looked similar, and providing some control over the sensors could potentially reduce this. This way the sensor values would not merely be affected by the surrounding context, but also be more controlled by the photographer.

3.3.1.3 Preliminary Qualities of Visual Aesthetics

The lomographers suggested that the effect with color traces (effect 2) should be lifted from the existing scene rather than overlaid, making each picture more unique and even more influenced by the existing situation. Further, all the effects should only be attainable in real time and according to Christian:

It has to be something special [only achievable in real-time], otherwise you might just as well add the filters afterwards.

Thus, the resulting aesthetics should preferably be particular for context photography, and should arise from the scene. By making them arise from the scene, this could also *lead* to more particular aesthetics.

4 The Context Camera

The final prototype is a result not only of the input of the lomographers practice, but also from a workshop held with other amateur photographers, as well as from the visual artist working with us to develop the visual affects.

The camera is now implemented as an application on camera phones, compatible



Figure 3. a) Context camera implemented on a camera phone.
b) Visual effects (top-left) Effect 1: colour shadows. (top-right) Effect 2: Zoom,
(bottom-left) Effect 3: Pixel, (bottom-right) Effect 4: Waves.

with two standard camera phone models, the Nokia 6600 and 6630 [18]. It uses the device's own hardware (lens and microphone), and measures sound level and computes the power of low, medium, and high frequencies. Movement is retrieved as a vector field at different points in the picture. For this prototype we changed aesthetics in some of the visual effects. For example, the color traces now raised from the scene.

The effects were grouped in the following way:

1. Colour shadows: Traces of coloured shadows follow movement; the colour of the shadows changes with the frequency spectrum of the surrounding sounds (Figure 3a).
2. Zoom: The part of the picture with most movement is zoomed in, and rendered as a transparent layer on top of the non-affected image; the amount of transparency is determined by surrounding sound level (Figure 3b).
3. Pixel: Small white dots follow movement as a decaying trace; the size of the pixels in the picture is proportional to the surrounding sound level (Figure 3c).
4. Waves: Movement creates waves in the image, making it look like a dense liquid. As in 3, the size of the pixels in the picture is proportional to the surrounding sound level (Figure 3d).

The visual effects were made visible once the picture has been taken. The user could select a visual effect, capture images, see the resulting photographs, save or delete them, and browse through them the same way as with a regular camera phone. Now, the user could also calibrate sound and motion sensitivity, to set his or her preferences for how much effect there should be. Both context pictures and original pictures without applied effects are saved together.

4.1 The Context Camera in Use

In order to test how the camera would be perceived and used based its functionality, the next step involved to conduct an exploratory user study with people *not* familiar with the concept [10]. This study involved seven people with a general interest in photography, with different nationalities and backgrounds. The participants used camera phones to take context pictures during a six-week period, and the study involved one mid-study questionnaire and a second one after the study.

Overall, the participants contributed with 303 uploaded pictures, and the most active participant uploaded 119 pictures, whereas the least active one uploaded a total of 11 pictures. All results were been analyzed based on the received pictures and the questionnaires.

4.1.1 Results From the Study

Below we present results that illustrate how the qualities (relating to the joy of the unpredictable, personal desires and technical properties affecting how pictures are taken, and views of aesthetics) similar to those previously found in the lomographic practice, turned out in the final prototype. A more general and extensive description of the results is found in [10].

4.1.1.2 The Joy of the Unpredictable

The challenge of having unpredictable dynamic sensors, such as sound and movement to affect the picture-taking moment, was an enjoyable quality with context photography. One of the participants, Erik, was a student who was interested in photography on an amateur level. He was the one who had uploaded the most pictures and stated that:

(...) much of the fun with context photography is that you feel you are not entirely in control over how the pictures will turn out. The situation will determine this...

However, the unpredictable input made Jane, a designer experienced in both analogue SLR and digital photography (who had taken 11 pictures), to make the following comment:

Although [the camera] is capable of [creating] 'creative' images this seems like a fluke rather than any creativity on the photographers part.

Camilla, a participant with a background in professional photography (who had uploaded 42 pictures) expressed that this might take some practice to learn:

I'm getting more practiced to see when to use it and to get what I am after.

For Sigvard who had a background in photojournalism (and had uploaded 50 pictures learning to take context pictures was an interesting experience:

Context photo made me after a while search for movements and noise to succeed [...] And this rendered a new and interesting experience and result.

Even though it would be more flexible to do post-edited effects to achieve a specific picture, context photographers appreciated the real time aspect of the picture-taking. This also suggests that the joy of context photography lies in the challenge of the situated-ness, being in a dynamic situation where sound and motion affect, involving a different experience than manipulating pictures afterwards. In lomography, much of the unpredictable enjoyment seemed to come from the resulting *unexpected* picture. However, the unpredictable enjoyment with context photography is different from lomography, as it is more directly connected to the picture-taking situation.

4.1.1.1 Qualities Affecting the Picture-taking

Similarly to how the technical properties of the lomo-camera affected the lomographic practice, the context camera also had specific technical properties that stimulated or inspired a specific use. The context camera was used to take snapshots in everyday situations, and people preferred to take context pictures in dynamic situations, for example snapping pictures in traffic or making someone scream. One participant, Erik, made the following comment about picture-taking with the context camera:

I would probably never have spontaneously taken a picture for example of a car passing by if it hadn't been for the effects that the application gives.

With context photography, interesting subjects to take a picture of in regular photography may no longer be interesting, unless they involve sound or motion. This way, the context camera became a kind of action camera, yet fundamentally different from the cameras used in lomography as it involved sound and movement input. If

other sensors would have been used, for example measuring temperature, it is likely that people would have explored taking snapshots in entirely different situations, for example searching for different heat sources, rather than an active traffic situation.

However, one participant, Jonas, expressed that the context camera also could be used as a regular camera:

If you don't do anything then it's like a regular camera.

Thus, similarly to lomography, it is also in the mind of the photographer to decide what context photography should be about, and which kinds of pictures that are taken.

The fact that the camera was implemented on a camera-phone also provided special technical properties affecting the experience. One participant commented that using camera phones in general made the attitude of taking pictures that were “less serious, more relaxed”. Another one liked the fact that he could instantly share his photos with others at the moblog or with friends.

In lomography, the optical effects informed a particular type of picture taking, but also the lack of zoom and autofocus, as they made the photographers take physically near pictures. Similarly, the sound and movement made context photographer take pictures different from the use of a regular camera (e.g. asking someone to scream).

4.1.1.3 Qualities of Visual Aesthetics

Similarly to Lomography, the context photographers wanted to get visual effects in the pictures they took. If a picture did not include effects and rather looked like a regular picture, it was *not* considered to be a satisfying context photo, even if it had a good composition. One user, Erik, made the following comment about a context picture with no visible effects:

It is a boring way to use the application. Therefore also a bad context photograph.

For all users, the resulting pictures had to have a balance in the amount of visual effects in order to be aesthetically pleasing. However, this balance was a matter of personal taste. By giving the photographers the possibility to calibrate the sensitivity of the sensors before use, they could more easily find their preferred balance. Just like in Lomography, the aesthetics were a matter of individual taste. Thus, which combination of context effects that was preferred was very subjective.

The resulting context pictures where either expected to *represent* sound and movement in a specific situation, or having a special feeling, added by the effects. For example, one participant presented a picture that his girlfriend took of him on their sailboat. The motor had been running, causing the image to be pixelized, and he expressed how the picture had captured the bad sound of his motor (Figure 4a). Another participant wanted context pictures to be different, and have a strong feeling of sound and movement in them. She described one of her favorite context pictures (Figure 4b) as:

Here one can imagine the sound of screaming.

Another participant expressed that he had *cheated* with the sensors (by tapping on the microphone), when picturing the head of a guitar. He wanted the context pictures to *add something* and described a resulting picture (Figure 4c) that he liked as:

It looks like you were sitting in an amplifier.

The fact that the pictures had been visually affected in the picture-taking situation, rather than visually manipulated afterwards, made the resulting pictures more interesting. One participant expressed that:

“In some way it feels more real. I did not manipulate this picture afterwards, this is how it WAS...”

The above suggests that the aesthetics in the context pictures were not only a result of visual effects, but also affected by *how* people took pictures. If lomographic aesthetics are affected by picture-taking such as getting close and “shoot from the hip”, the aesthetics in context pictures are a result of creative picture-taking involving sound and movement, such as asking someone to scream, taking pictures in traffic and of music instruments.

5 Discussion

If experience is considered subjective and highly personal, *designing for experience* could also take such experiences as a starting point. This paper describes how we informed our design with inspiration from specific individuals involved in an alternative or marginal photographic practice. Such an approach of learning from comparatively few individuals engaged in a marginal practice, may involve the risk of making the final design less appealing to a more general audience. However, we find that this is also likely to lead to a more innovative design, simply because it is based on views and experiences different from the most general and traditional ones. Furthermore, even if a specific practice is considered marginal, it may still involve specific *underlying qualities* of experiences that can appeal to a larger group. Thus, alternative practices do not necessarily have to involve people that are odd, or somehow very different from others. Rather, these individuals might have similar underlying needs or interests as many others, only that their specific approach is different and overseen by other people.

In a way, we have explored how to transfer and build upon existing *qualities* of experience into our design, as a way to ground the design for a novel yet *meaningful* photographic experience. The chosen practice helped us to understand how early ideas of unpredictable sensor data, could become an enjoyable integrated part of the experience. We learned that the practitioners in this alternative practice could best provide important lessons about their existing experiences of taking pictures. Thus, to brainstorm about not yet existing designs (which was beyond the practitioners expertise) was less giving.

Our final prototype was not evaluated by lomographers, but with intended users, i.e. amateur photographers interested in new types of photography. This is because the design outcome was not intended for the lomographers, but for a more general user group. Further, we felt that evaluating with potential users (rather than the lomographers) without previous knowledge to when or why to take context pictures, could also give rise to a more open-minded exploration of the prototype.

The transfer of qualities from an alternative practice into the design of interactive technology, has inspired us to continue to work in this direction. Our more recent work has involved developing a method based on this design process; *transfer*

scenarios [13]. This method investigates how to more systematically transfer findings from an alternative or marginal practice, into the design of technology, intended for a more general audience. This way, we aim to provide better tools for designers when learning to design for specific experiences.

6 Conclusion

We have described how an alternative practice could contribute to the design of novel digital photography: *context photography*. The lomographers provided us with knowledge about underlying qualities in an enjoyable photographic practice, such as qualities relating to the joy of the unpredictable, personal desires and technical properties affecting how pictures are taken, and qualities of visual aesthetics. This was then used to design for a meaningful photographic experience. When testing the context camera with intended users, we found that we not only had succeeded in transferring underlying qualities of experience, but also had succeeded with creating a *novel* picture-taking experience.

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References

1. Bitton, J., and Agamanolis, S. RAW: Conveying Minimally-Mediated Impressions of Everyday Life with an Audio-Photographic Tool. *Proc. of CHI'04*, ACM Press (2004).
2. Buchenau, M. and Suri, J. F. 2000. Experience prototyping. In Proceedings of the Conference on Designing interactive Systems: Processes, Practices, Methods, and Techniques DIS '00. ACM Press,
3. Davis, M., Van House, N., Towle, J., King, S., Ahern, S., Burgener, C., Perkel, D., Finn, M., Viswanathan, V., and Rothenberg, M.: MMM2: mobile media metadata for media sharing. In CHI '05 (2005)
4. Fiore, S., Wright, P., and Edwards, A.: A Pragmatist Aesthetic Approach to the Design of a Technological Artefact. In Proc. of Critical Computing: Between Sense and Sensibility'05, ACM Press (2005), 129-132
5. Fröhlich, D. and Tallyn, E.: Audiophotography: Practice and Prospects. *Proc. of CHI'99*, ACM Press (1999)
6. Gemmell, J., Williams, L., Wood, K., Lueder, R., and Bell, G. Passive capture and ensuing issues for a personal lifetime store. In Proceedings of the the 1st ACM Workshop on Continuous Archival and Retrieval of Personal Experiences (2004)
7. Graves Petersen, M., Sejer Iversen, O., Gall Krogh, P., and Ludvigsen, M.: Aesthetic Interaction – A pragmatist's Aesthetics of Interactive Systems, In Proc. of DIS'04, ACM Press (2004) 269 - 276

8. Hall, T. and Bannon, L.: Designing ubiquitous computing to enhance children's interaction in museums. In *Proceeding of the 2005 Conference on interaction Design and Children* (Boulder, Colorado, June 08 - 10, 2005). IDC '05. ACM Press, New York, NY, 62-69. (2005)
9. Håkansson, M., Ljungblad, S. and Holmquist L. E.: Capturing the Invisible: Designing Context-Aware Photography. *Proc. of DUX'03*, ACM/AIGA (2003)
10. Håkansson, M., Gaye, L. Ljungblad, S. and Holmquist, L.E.: More Than Meets the Eye: An Exploratory User Study of Context Photography. *Proc. NordiCHI'06*, (2006)
11. IDEO Method Cards: 51 Ways to Inspire Design W. Stout Architectural Books, San Francisco <http://www.ideo.com/methodcards/>
12. Kindberg, T., Spasojevic, M., Fleck, R., and Sellen, A.: The Ubiquitous Camera: An In-Depth Study of Camera Phone Use. *IEEE Pervasive Computing* 4, 2 (2005), 42-50.
13. Ljungblad, S. and Holmquist, L.E. Transfer Scenarios: Grounding innovation with Marginal Practices. To appear in *Proc.CHI'06*. ACM Press (2006)
14. Ljungblad, S., Håkansson, M., Gaye, L. and Holmquist, L. E.: Context Photography: Modifying the Digital Camera Into a New Creative Tool. *In Ext. Abstracts of CHI'04*, ACM Press (2004), 24-29
15. Lomographic society: www.lomography.com
16. McCarthy, J. and Wright, P.: 2004 *Technology As Experience*. The MIT Press.
17. Norman, D. A: *Emotional Design: Why we love (or hate) everyday things*. New York, NY: Basic Bookspp. (2004).
18. Rost, M., Gaye, L., Håkansson, M., Ljungblad, S., and Holmquist, L.E: Context Photography on Camera Phones. *In Extended Abstracts of UbiComp'05*, Tokyo, Japan, 2005 (demonstration).
19. Sengers, P.: *Autobiographical Design*. CHI'06 Workshop on Theory and Method for Experience Centered Design
20. Van House, N., Davis, M., Ames, M., Finn, M., and Viswanathan, V. The Uses of Personal Networked Digital Imaging: An Empirical Study of Cameraphone Photos and Sharing. *Extended Abstracts of CHI'05*, Portland, Oregon, USA, (2005).
21. Von Hippel, E. Lead Users: A Source of Novel Product Concepts, *Management Science* 32, No 7 (July (1986), 791-805