Designing interactive technology for crowd experiences
—beyond sanitization

PhD Dissertation
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Abstract

This dissertation concerns the topic on designing interactive technology for crowd experiences. It takes the outset in the experience-oriented design approach within interaction design, exploring the research question *how can we conceptually understand and design interactive technology for crowd experiences?* Through theoretical studies of sociological crowd theory and pragmatist perspectives on experience combined with design experiments at sporting events this dissertation establishes an conceptual understanding of crowd experience. The outcome of this work is furthermore synthesized in a conceptual model of social experiences that presents crowd experiences as a distinct type of social experience. This is different from what previously have been explored within experience-oriented design. This dissertation is composed of four research papers framed by an overview that summarizes and crystalizes the arguments made in the papers. The contribution of my dissertation consists of three highly intertwined parts all concerning how to understand and design interactive technology for crowd experiences.

The first and primary part of the contribution is a **conceptual understanding of crowd experience** within interaction design. This dissertation introduces an understanding of crowd experience as a distinct type of social experiences driven by *non-rational* behavior. This conceptual understanding is established in the intersection between sociological crowd theory and a pragmatist perspective on experience. In particular, I point to *imitation* and *emergence* as two central behavioral crowd dynamics that promotes the experimental qualities of a sense of a *we-phenomenon* and a *capricious potential* in the crowd. The theoretical and empirical work is crystalized into a conceptual model of social experience within experience-oriented design that provides designers and researchers with an awareness and vocabulary of crowds’ distinct sociality, when designing interactive technology for crowd experiences.

The second contribution of the dissertation is a **perspective on spectator experiences that goes beyond sanitization**. The domain of my experimental design inquiries is at sporting events. From extensive theoretical studies and my empirical explorations I present a perspective on modern and professionalized sporting events as *sanitized*, where the spectator experiences and technology are being produced, controlled, and organized. The spectator is considered as a consumer of the sporting event rather than as an active participant. I stage the potential to explore the active participation of crowds
when designing technology-supported spectator experiences at sporting events as an alternative to sanitization.

The third part of the contribution of this dissertation is the experimental prototypes and concept designs developed through design research activities. These experiments should be considered as conceptual explorations that in partnership with my conceptual understanding of crowd experience provide potential suggestions for interactive technology for crowd experiences.


Den anden del af denne afhandlings bidrag er et perspektiv på publikumsoplevelser der går ud over sanitering. Domænet for mine design experimenter er sportsbegivenheder. Baseret på omfattende teoretiske og empiriske studier præsenterer jeg et perspektiv på moderne og professioniseret sportsbegivenheder som saniterede, hvor publikumsoplevelsen og den dertilhørende teknologi er produceret, kontrolleret og organiseret. Publikum bliver betragtet som en konsument af sportsbegivenheden mere end en aktiv deltager. Jeg argumenterer for et potentielle i at udforske den aktive deltagelse i masser
når man designer interaktiv teknologi til publikumsoplevelser ved sportsbegivenheder, som et alternativ til sanitering.

Den tredje del af denne afhandlings bidrag er de eksperimentelle prototyper og koncept-design, der er blevet udviklet gennem design forskningsaktiviteterne. Disse eksperimenter skal betragtes som konseptuelle experimenter der i kombination med min konceptuelle forståelse af masseoplevelser etablerer potentielle forslag til teknologi-understøttet masseoplevelser.
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PART I: DISSERTATION OVERVIEW
1 Introduction

A mob is a strange phenomenon. It is a gathering of heterogeneous elements, unknown to one another; but as soon as a spark of passion, having flashed out from one of these elements, electrifies this confused mass, there takes place a sort of sudden organization, a spontaneous generation. This incoherence becomes cohesion, this noise becomes a voice, and these thousands of men crowded together soon form but a single animal, a wild beast without a name, which marches to its goal with an irresistible finality. The majority of these men had assembled out of pure curiosity, but the fever of some of them soon reached the minds of all, and in all of them there arose a delirium. (Tarde 1968, p. 323 italics added)

Most of us, if not all of us, have attended a pop or rock concert where, as we stood in the mass of the audience, the lead singer stopped the music in the chorus of a song and reached the microphone forward into the mass. A sudden organization takes place, and the crowd starts to sing. It is not that the crowd’s singing sounds good, but it seems that the noise becomes a voice in the special sense of a cohesion in the crowd in which everybody participates. Collective participation has transformed the mass of the audience at the concert into a crowd, and has given individuals a distinct sense of being part of something larger than themselves. This is a phenomenon that cannot be reduced to the sum of individual actions.

During the last four years, my academic interest has taken its point of departure in this question: how can we conceptually understand and design interactive technology for crowd experiences?

My research for this dissertation has concentrated on crowd experiences that, though shared by many people, have not yet been addressed within the field of interaction design or Human–Computer Interaction (HCI). I use the term crowd experience to denote a unique and distinct type of social experience different from those occurring in groups or in other types of social gatherings. Crowds are not new phenomena, of course, but over the last decade crowds at festive, political, and sporting events have become increasingly supported by technology. If interactive technology is to be designed for crowds like these, such emergent and distinct crowd experiences need to be understood and accommodated within the field of interaction design. This dissertation therefore
Chapter 1
draws on sociological crowd theory to introduce a conceptual understanding of crowd experiences that can be deployed within the fields of HCI and interaction design.

I have explored crowd experiences at football sporting events, researching a possible basis for the design of technology-supported crowd experiences. Sporting events are an interesting domain of inquiry because they provide good access to the empirical study of crowds: spectators are not in short supply and they regularly attend these events and interactive technology is becoming an ever more significant part of what these events offer. However, the last 50 years have seen an important development in sporting events: they have been professionalized and modernized from a rationalistic perspective, with an increasing focus being placed on safety, control, organization, and bourgeois and consumer behavior (J. Clarke 1978). This has led to a process of sanitization (Bale 1993), whereby the spectator experience has increasingly been rendered into consumable form, ready for spectators to consume on the stands. This sanitized experience is very different from the participative crowd behavior and experience to be found on the stands. The sanitization has also affected the use of technological systems at sporting events. Events organizers have increasingly invested in new interactive technologies to support the spectator experience through smartphones: they have made it easy for spectators to use their smartphones to order food, drinks and merchandise, to locate seats or parked cars after the event, to get background and statistical information about the sport, and to get multimedia content (close-up shots, replays). This technology provides individual spectators with the same convenient experience of the sport that they would have in front of their television at home. However, most of the spectators I have interviewed about their reasons for attending a sports event, rather than watching at home in comfort, state that they attend to support their team and to experience being a part of the atmosphere created by spectator crowds. Sports clubs therefore face the challenge of how to design interactive technology that goes beyond supporting individual spectator’s engagement with the sport in comfort and convenience at the stadium. There also seems to be an unexplored potential within the fields of HCI and interaction design in general for exploring technology-supported crowd experiences as an alternative to individual and collective experiences.

My research contributes to the experience-oriented design approach within interaction design research. In particular, I have found inspiration in pragmatist perspectives on technology-supported experiences as holistic and constructivist phenomena in which people engage and invest themselves. Experience-oriented design is challenged in dealing with crowd experience because of the lack of conceptual understanding of the distinct sociality of crowds. But current pragmatist perspectives within experience-oriented design still provide a holistic and constructivist understanding of experiences that complements my conceptual understanding of crowd experience.

My contribution has been developed through reflections, discussions, literature studies, ethnographically inspired field studies and, not least, experimental design work. This

1. Also known as soccer.
last was carried out in two research projects on crowd experiences at sporting events: the BannerBattle experiment, carried out as a part of the iSport project at the Center for Interactive Spaces, exploring how to design interactive technology for spectator experiences at sporting events; and the Crowd App Concept, an experimental project under the EVINN project at the Alexandra Institute, exploring crowd experiences at sporting events.

1.1 The contribution

The overarching contribution of my work is a conceptual understanding of crowd experiences within experience-oriented design. Furthermore, as a by-product of answering my research question, I present two additional contributions: first, a perspective on technology-supported spectator experiences that goes beyond sanitization, and secondly, an experimental prototype (BannerBattle) together with a concept design (Crowd App Concept). As already described, in bridging various different academic fields, phenomena, and domains, my work should not be considered exhaustive. Rather, it aims to introduce and develop a conceptual understanding of crowd experience within the field of experience-oriented design. My research has consisted of three highly intertwined parts:

A conceptual understanding of crowd experiences: This dissertation contributes an introduction to and a conceptual understanding of crowd experiences as a distinct type of social experience driven by non-rational behavior (see chapters 4, 7, and 8). This conceptual understanding is established in the intersection between the theoretical foundation of sociological crowd theory and pragmatist perspectives on experience. In particular, I point to imitation and emergence as two central, non-rational crowd behavioral dynamics that promote the experiential qualities both of being part of a we-phenomenon and of a capricious potential: a we-phenomenon in the sense that crowd participants feel that they are a part of something larger than themselves; and a capricious potential as the spontaneous, unforeseen, and creative potential emerging in the crowd. On the basis of both theoretical and empirical work, I have synthesized a conceptual model that introduces a vocabulary and an awareness of crowds’ distinct sociality into experience-oriented design for the purpose of designing interactive technology for crowd experiences.

Spectator experiences beyond sanitization: I provide a new perspective on technology-supported spectator experience that can support spectators’ active social participation in sports events (see chapters 2, 8, P1, and P3). I have extensively researched both literature and empirical studies that relate to spectator experience of sporting events. On the basis of these studies, I present a perspective that sees modern, professionalized sporting events as sanitized in the sense that spectator experiences are produced, controlled, and organized by the sports clubs. I discuss how this sanitization has affected the development of technological systems at sporting events, where the focus is primarily on augmenting the event by providing additional information and statistics on digital platforms. As an alternative to sanitization, I point to the potential in exploring crowds’ active participation when designing for technology-supported spectator experiences at sporting events.
Design experiments and concept design: In my experimental design research I have developed an experimental prototype and a concept design being deployed at sporting events. I consider these to be a part of my contribution rather than a contribution in themselves. They are experimental and conceptual designs that have played an active part in my designerly and exploratory inquiries into the context of sports events.

These three parts of my contribution are intertwined and have mutually influenced each other. My conceptual understanding of crowd experiences has been informed by interchangeable theoretical, empirical, and designerly inquiries.

My research is materialized in research papers that are framed by an overview. Each paper presents a perspective, a finding, and contributions (P1-P4). Thus these papers should be considered as bricks, each one contributing to my research program. The overview aims to assemble my main contribution from these papers.

1.2 The dissertation
This dissertation has two main parts: a dissertation overview, framing my research study; and a selection of four peer-reviewed papers that were presented at conferences or published in international journals.

1.2.1 Thesis Overview
The overview part of the dissertation consists of nine chapters.

Chapter 1 introduces the dissertation, presenting the contributions and the included papers.

Chapter 2 provides a historical and theoretical account of football sporting events and related technologies as a context for my thesis. In particular, I advance a perspective on modern and professional sporting events as sanitized (Bale 1993; 2000), in the sense that both event and stadium are carefully structured and designed from a rationalistic perspective that limits active and social participation by spectators in the event (this argument is also unfolded in P3). I argue that contemporary technological systems at sporting events inherit this sanitized perspective, with their focus on giving the individual spectator information about the sport on smartphones or on large displays (see also P1). I further discuss technologies within HCI that in various ways aim to stage the more active and social aspects of being a spectator.

Chapter 3 positions my contribution within an experience-oriented design approach in the interaction design field. I outline how in HCI crowds are generally seen as rational entities that are capable of performing large and complex tasks. I further present how the experience-oriented design approach in interaction design has focused on social experiences in relation to how people co-construct and negotiate meaning of their experiences (see also P2 and P3). I end this chapter by pointing to the unexplored potential of discussing the non-rational crowd experience as a distinct type of social experience to be considered within experience-oriented design.
Chapter 4 begins to unfold my contribution by establishing a conceptual understanding of the crowd as a distinct sociality that differs from other types of groups and social gatherings. This chapter is motivated by the need for an understanding of crowds within experience-oriented design, as staged in the previous chapter. Drawing on the crowd theory of Gabriel Tarde (1899; 1962; 1968), Gustave Le Bon (2001), and Elias Canetti (1984), I concentrate on non-rational, spontaneous crowd behavior. In particular, I emphasize two central behavioral crowd dynamics: imitation and emergence (see P2 and P3). To establish the link between crowd behavior (imitation and emergence) and crowd experience, I draw on Bakhtin’s (1984b) pragmatist perspectives on the experience of being a part of a carnival crowd. With this link established, I argue that imitation promotes the unique experiential quality of being a part of a we-phenomenon, while emergent behavior fosters a capricious potential within the crowd (see P3). I summarize this chapter by pointing to how crowds and crowd experiences distinctly differ from how they are currently understood in the field of experience-oriented design.

At this point in my dissertation I have presented the domain of my inquiries as spectator crowds at sporting events and the challenges of designing interactive technology that supports spectator crowds’ active and participative experiences. I have positioned my contribution within experience-oriented design approach within interaction design but also outlined how crowds, as a distinct sociality driven by non-rational behavior, have not yet been explored. Thus I draw on sociological crowd theory to establish a conceptual understanding of crowd experience, which I introduce to experience-oriented design.

Chapter 5 takes its starting-point in the challenge of generating knowledge and investigating possible future technology-supported crowd experiences within experience-oriented design (see chapters 3 and 4). I therefore present how I have carried out my experimental design research approach in order to inquire into my research question. My research approach can be categorized as a research-through-design approach with a strong conceptual focus. In my research, I engaged in design interventions and activities to generate knowledge to support a conceptual understanding of crowd experiences.

Chapter 6 presents the design experiments described in the papers and in this overview. I present the BannerBattle project, which aimed to initiate an exploration of crowd experiences at a series of sporting events; the Crowd App Concept, which had a strong conceptual focus on exploring the crowd dynamics of imitation and emergence at a sporting event; and the Gaming the Museum workshop, a methodological exploration of how to inquire into engagement.

Chapter 7 unfolds my contribution as a conceptual model of crowd experience. Synthesizing my theoretical and empirical endeavors, this model establishes a conceptual understanding of crowd experiences as a distinct type of social experience that are driven by the non-rational behavior of imitation and emergence. The aim of the model is to give interaction designers a vocabulary and an awareness of the distinct sociality of crowds that will allow them to design interactive technology for crowd experiences.
Chapter 8 discusses the scope of my contribution in three respects. First, I discuss what I consider a crowd to be, as well as the benefits of considering crowds as a distinct sociality in interaction design. The type of crowds addressed in this dissertation are those that are driven by the behavioral dynamics of imitation and emergence—not the number and scale of people gathering, but the sociality of crowd. Second, I discuss how crowd experiences should be considered as an additional type of social experience, building upon and complementing current experience-oriented design rather than replacing or discarding current understandings of social experiences. Last, I discuss how technology-supported crowd experiences could transcend beyond the sanitized experiences and support active and social participation by spectator crowds at sporting events.

Chapter 9 concludes the dissertation overview and presents directions for future research.

1.2.2 Papers Included

The second part of the dissertation contains four published peer-reviewed research papers (P1-P4). While each paper provides an independent contribution, each also contributes to my overarching research by providing specific arguments, perspectives, or concepts that support my research question.

P1: Designing technology for active spectator experiences at sporting events


P1 emphasizes and explores the active spectator experience at sporting events by presenting and reflecting upon the BannerBattle experiment carried out at a series of football sporting events. The initial hypothesis of the design experiment is that the spectator experience is not limited to receiving and consuming entertainment, but relies heavily on spectators’ active and social participation, which is what constitutes the atmosphere of the entire event. The spectator experience discussed in this paper also supports my dissertation’s contribution on active and participative spectator experiences within the crowd at sporting events.

P2: BannerBattle—introducing crowd experience to interaction design


P2 introduces an awareness of crowd experience to the field of interaction design research. Based on the existing literature on European crowd theory by Gabriel Tarde (1962; 1968) and Gustave Le Bon (2001), this paper introduces three qualities of crowd experience to interaction design: imitation, emergence, and self-organization. These three qualities informed the design of the research prototype BannerBattle, an interactive display for supporting crowd experiences at football stadiums. The paper discusses how crowd theory complements and challenges current experience-oriented design approaches.
This paper formed the initial theoretical foundation of my conceptual understanding of crowds as further unfolded in this dissertation.

**P3: When noise becomes voice: designing interactive technology for crowd experiences through imitation and invention**


**P3** is a further conceptual development of crowd experience as a novel concept in the design of interactive technology for spectator crowds in public settings. Marrying crowd theory (Canetti 1984; Le Bon 2001; Tarde 1899; 1962; 1968) and the pragmatics of experience (Bakhtin 1984b; Dewey 1997), this paper establishes an understanding of crowd experience as a distinct sociality within interaction design, unfolding through imitation and invention and promoting both a sense of a *we-phenomenon* and a *capricious potential*. The paper is based on the BannerBattle experiment. Building on the theoretical work presented in **P2**, it establishes the initial conceptual understanding of crowd experience on which the dissertation is based.

**P4: Participatory Design at the museum—inquiring into children’s everyday engagement in cultural heritage**


**P4** explores how the conceptual qualities of engagement may be investigated independent of any contextual and cultural constraints. The paper proposes a methodological approach to inquiry into teenagers’ everyday engagement in computer games and online communities as the point of departure in the design workshop Gaming the Museum. Even though the domain was a museum, the workshop provided valuable knowledge on the methodological approach that have been relevant in my research on engaging crowd experiences.
2 Sporting events as a domain of crowd experience

This dissertation concerns sporting events, but is not actually about sporting events. It is about crowd experiences, and sporting events are the empirical domain of inquiry. Empirical investigations of crowd experiences can be difficult to do, because crowds are transient, spontaneous phenomena that may or may not emerge at political rallies, concerts, festivals or even theater performances (see chapter 4). The challenge of studying crowds in these situations is that these are often standalone events and there is no guarantee that crowd phenomena will emerge. I chose to investigate crowd experiences in the domain of European football sporting events because the qualities of crowd experiences (see chapters 4 and 7) are present in these situations. Crowd participants at these events are highly engaged in crowd behavior and activities in order to support their team, and they battle with the opposing spectator crowd for power and dominance at the sporting event. Such crowd behavior fertilizes and increases the potential for crowd experiences, which are a rather momentary and transient phenomenon. Furthermore, football sporting events provide good access to the study of crowd experiences on a regular and continuous basis. Because sporting events are scheduled and serial, empirical investigation of crowds can be planned and organized over a period of time. The sporting events also offer the opportunity to engage in a continuous dialogue and collaboration with the football club and fans in relation to field studies, interviews, workshops, and design experiments carried out at the stadium. Finally, there is an unexplored potential for technology-supported crowd experiences at sporting events as an alternative to today’s technological systems, which merely provide finalized produced content for spectators to consume on large displays or on their smartphones. I will unfold this argument further in this chapter.

First, however, I will provide a brief history of sporting events to provide a context for the role of technology-supported crowd experiences. Then I will provide an overview of the current landscape of technology-supported spectator experiences. The argument made here is based on the discussion of sanitized spectator experiences in P3 and

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2. The empirical scope of this dissertation lies within European football sporting events. When I write “sporting events” in what follows, I mean European football events.
elaborates on spectator experiences that are mediated by digital technologies at larger sporting events.

2.1 Sanitization of spectator experiences
During the last half-century, sporting events have developed a high degree of professionalization and modernization (J. Clarke 1978). Professionalization of the sport and modernization of the stadiums have inevitably affected the spectator experience at sporting events. Contemporary sporting events offer many improvements, such as improved athletic performance, together with safety, comfort, and convenience at the event itself. Both scholars and spectators have argued, that professionalization and modernization have sanitized the spectator experience, as increasing importance is attached to organization, control, safety, and bourgeois behavior (Bale 2000).

2.1.1 Professionalization and modernization of sporting events
Football was traditionally considered a working-class entertainment. At the weekly football match, the working-class man could momentarily get the feeling of success from the team he supported. Masculine play, physical strength, and team spirit were highly appreciated—aspects that working-class men could align with (J. Clarke 1978, p. 41). From the 1950s, as the middle class expanded and grew wealthier, rising living standards confronted middle-class consumers with a variety of new leisure and entertainment opportunities. Large shopping centers, cinemas, steak houses, bowling centers and similar leisure facilities were built to accommodate their leisure interests. These increasing diverse leisure options challenged sports clubs to focus increasingly on entertainment, leisure, and convenience in order to appeal to their growing middle-class clientele. It can be argued that this increased professionalization and modernization moved the sport of football and sporting events in general into the entertainment industry (J. Clarke 1978, p. 45).

First, the sport’s values changed from participatory and masculine values to individual and technical ball play (I. Taylor 1971, p. 364). “Participatory” means that spectators felt they had a close personal relationship with the club. The team consisted of local players whom spectators met and talked to in everyday local community life. The masculine values of the sport were manifested in intensive collective physical play. An increased focus on individual players’ technical skills, efficient ball play, and performance came to supplant these values. Cross-national “super tournaments”3 were established to bring Europe’s best players together to provide spectacular sporting experiences of high quality and entertainment value. The teams themselves furthermore developed greater organizational and tactical skill (J. Clarke 1978, p. 46) which, combined with the introduction of televised broadcasting of matches, made the sport more dramatic and spectacular to watch.

3. Such as the European Cup, first held in 1955 as a tournament for European premier clubs, which became Champions League. (UEFA 2011)
Second, the stadium itself was modernized, with improvements to its physical facilities through the addition of new stands, extra seats, toilets, bars, restaurants, sports museums, merchandise shops, and social clubs (Crabbe & Brown 2004, p. 32). Functional elements—such as innovative design, safety, comfort, accessibility, and hospitality for all types of spectators—combined with an increased commercial focus were at the center of the modern stadiums (Paramio et al. 2008, p. 527). The sporting event setting was made comfortable and multi-functional. The pitch too was modernized. High-voltage light poles were erected for illumination. Spotlights made the event look more dramatic and theatrical, focusing on the sport itself and leaving the surrounding stands in darkness (Bale 1993, p. 45). Pre-match and half-time entertainment in the form of spectacular shows and cheerleaders were added to entertain the spectators while they waited for the match to begin. The stadiums’ enhanced physical facilities, convenience, and increasingly bourgeois atmosphere attracted a broader, wealthier and more diverse group of spectators to attend sporting events (J. Clarke 1978, p. 34). Sporting events had become much more like entertainment and leisure events.

2.1.2 Sanitization of spectator experiences at modern sporting events

Although the new kind of sporting events have during the last couple of decades attracted even more spectators to the sport (Storm & Brandt 2008, p. 158), some have argued that the sport and event have been sanitized by the limitations placed on spectators’ active engagement, self-expression, and possibility for ecstatic celebration on the expense of an increased rationalistic focus on safety, convenience, leisure, and crowd management (see e.g Bale 1993; 2000; Crabbe & Brown 2004; King 1998). Especially within the last couple of decades, a variety of initiatives have been taken to discourage violent spectator behavior and to make the sporting event safer and more organized. This was a natural response to the tragedies of European football in the 1980s and 1990s (e.g. L. J. Taylor 1989). John Bale (1993) has argued that while rationalization is not in itself a bad thing, but it has become hindering rather than enlightening. He argues that the rationalizing process and the enhanced convenience and comfort have actually dehumanized the sporting event. Sanitization has limited what can happen spontaneously, autonomously, and accidentally (Relph 1981, p. 104). Replacing stadium terraces with all-seater stands as a safety measure has, Bale argues, compartmentalized and limited the spectators’ possibilities for freely expressing themselves through dialogue, movement, and interacting with other spectators (Bale 1993, p. 47). Following Bale, King (1998) argues that all-seater stadiums hinder spectators’ ecstatic celebration, bodily movement, and self-expression. The seats isolate the individual spectators and obstruct physical and social interaction (King 2010, p. 23). J. Clarke (1978, p. 47) argues that the spectator is now considered one of passively enjoying the athletic performance of the sport in a comfortable and convenient setting, with the event being something that goes on “out there” on the pitch, rather than something the spectators take an active part in.
Naturally, these accounts of the sanitization of sporting events risk romanticizing the old working-class sporting event. It is crucial to understand that I am not arguing in favor of the traditional sporting event. Safety should certainly be the primary concern at today’s sporting events. However, these arguments do raise important concerns about the sanitization of spectator experiences at sporting events. In this dissertation, I will argue that an alternative approach to spectator experiences at sporting events could be to unfold desirable technology-supported crowd experiences (see chapters 4, 7, and 8).

### 2.2 Spectator technologies at sporting events

The design of interactive technology to support the possibilities for people to reflect, share, and negotiate the meaning of their social experiences has been explored, but not yet in the context of the crowd. Even though this dissertation contributes to the field of interaction design, I will in this section broaden the scope of spectator technologies to include the general field of HCI, as a variety of different examples relate to technology-supported spectator experiences.

During the last decade, sports stadiums have implemented technologies to support spectators’ experience at sporting events. Most modern stadiums have large displays which present additional information about the sport and show replays or close-up shots of the match (Crawford 2004, p. 73). The displays are implemented for two main reasons: first, to bridge the increasing distance between sport and spectator in large modern stadiums (Raitz 1995 p. xi), and second, to give the spectators additional information about the match and the players. To some degree the displays blur the boundaries between attending and watching the match at home by ensuring that spectators do not miss the extra information they would have had access to at home in front of their TV or PC (Bale 2000, p. 34; Crawford 2004, p. 73; Oriard 1981, p. 38). These displays have become routine at most premier-league* stadiums, and they seem an obvious enhancement of spectator experience at modern events. Providing content about the sport for spectators on these displays aligns with the sanitized perspective of the contemporary sporting event, in which the sport itself is considered the main product and the center of attention.

However, additional interactive technologies have been developed to explore and support spectator experiences at sporting events, both in research prototypes within an academic context and commercial technological systems implemented at sporting events. The commercial systems, while not directly contributing to academic study, serve the purpose of mapping out the general perspective of spectator technologies in academia and in the commercial world.

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4. I use the term Premier League to mean the best national football tournaments.
2.2.1 Augmenting the sport
A primary interest within the HCI field in sporting-events technologies has been the exploration of augmenting the sport on new technological platforms such as smartphones. Mobile “infotainment” applications have been developed, which explore the possibility to watch live-video streams of replays and close-up shots and to see statistical information about the sport (e.g. Ault et al. 2008; Bentley & Groble 2009; Glotzbach et al. 2005). Olssen & Nilsson (2002) further this functionality by creating a multichannel application combining WAP, web portal, digital radio, and SMS communication in one application to offer the spectator essential information about the sport. Going beyond infotainment applications on mobile devices, there have been experiments with technologies that support entertainment content beyond the sport in the stadium, for example allowing spectators to order food and drinks from their seats in the stands (e.g. Dollarhide 2007, p. 7). With a ubiquitous perspective, Sun et al. (2008) have explored the spatial and contextual aspects of attending the sporting event as a way of differentiating and maximizing information relevance for the spectator at the sporting event. These contributions have succeeded in making the next evolutionary step from presenting information about the sport on large displays to delivering it on spectators’ smartphones. Simultaneously delivering live-streaming content to thousands of smartphones at a sporting event is in itself a novel engineering achievement. These contributions still aim to support the individual spectator experience as the spectators consume produced video content and information about the sport on their single-user device. Bently and Groble (2009, p. 478), however, discovered the social potential of their infotainment app, where spectators were sharing content together on a shared smartphone. This illustrates the potential for greater focus on technology-supported social experiences at sporting events.

2.2.2 Towards participation, engagement, and collective experiences
Designing technology to support spectator experience at sporting events has so far focused on the individual spectator’s experience of the sport. The content delivered to spectators is entirely produced by the clubs. There is hardly any spectator involvement in the content production. However, if the scope of related technologies is broadened outside sporting events at stadiums, there may be scope for additional examples of interactive technology supporting spectator experiences as social, active, and participative.

A range of commercial concepts have explored the potential for designing technology for a collective body of spectators. Coldplay have given spectators a LED wristband that the band could control from the stage, turning it on and off and changing its color (Morris 2012). At the closing ceremony of the London 2012 Olympic Games, each of the 70,500 spectators had a small board with nine LEDs that collectively functioned as a huge 360-degree display at the stadium (Dezeen 2013). And Disney World have infrared-controlled LED Mickey Mouse ears, which glows and turns spectators into a synchronized lightshow (Goddard 2012). But even though these are great examples of staging the collectivity of spectators at concerts, in stadiums or in theme parks, the
spectators are passive—they cannot interact with the devices, which are fully controlled by officials. So although these examples might stage a social awareness of the spectators’ collectivity, the technology is closed and constrained and leaves no option for the spectators to interact with it.

There are some examples of technologies that actively engage spectators at sporting events. Esbjörnsson et al. (2006) and Jacucci and colleagues (2006; 2007; 2005) explore shared and actively constructed experience among spectators attending car rallies. They have developed a mobile application that lets spectators capture pictures and stories of their experiences and share them with other spectators. Here, in constructing their experiences and stories for sharing, the spectators are the protagonists. Involving the spectators more directly, Tomitsch and colleagues (Aigner et al. 2004; Tomitsch et al. 2007) explore the possibilities of letting the spectator crowd participate as judges at sporting events, based upon the level of applause. In this case, spectators wear a wireless motion-sensor unit on a wristband.

Outside sporting events, large-scale collective interactions have been explored in various contexts. In nightclubs, designers have tried to emphasize the relationship between audiences and performers (Hook et al. 2011). Further active audience involvement was explored in an example where the audience could directly affect the DJ’s musical performance through small motion sensors (Feldmeier & Paradiso 2004). Similarly, but in a concert context, Freeman (2008) has explored how the audience can modify and co-create the music notations in real time. Barkhuus & Jørgensen (2008) have explored how the audience at a rap competition vote on their favorite rap performance by employing a cheer meter. At the cinema, Maynes-Aminzade et al. (2002) have exemplified how a large group of people collectively control objects on a large display by leaning their bodies to left and right.

More recently, as interactive technology has moved out into public and semi-public locations, the spectator—performer relationship has been discussed and explored in a variety of cases (e.g. Calvi 2013; Dalsgaard & Hansen 2008; Giovanardi et al. 2013; Reeves et al. 2005). Macaulay et al. (2006) have argued that performativity is emerging in the field of HCI. Although most of these contributions relate to prototypes in the public and musicological settings, the interesting thing here is to consider the spectator as co-creator rather than consumer of the event. The categories of audience, user, spectator, and performer vanish, and the occasion become a mutual exchange of performative behavior. Spence et al. (2013) have emphasized active co-creative spectator involvement by establishing the concept of performative experience design.

In sum, the current landscape of technologies to support crowd experiences at sporting events is rather desolate. Most technologies are designed to support spectators with a more detailed and more informative perspective on the sport, whether this is on large displays or on smartphones. The aim has been to augment the sport for the individual spectator by means of produced information about the sport itself. These prototypes in many respects fit the rationalistic perspective of sanitization. However, some experiments
have explored allowing spectators to actively construct their experiences through sharing and storytelling at distributed sporting events. Beyond sporting events, prototypes have explored the active and collective aspects of spectator experiences in nightclubs, concerts, and cinemas. I also pointed to the emergence of performative experience design, acknowledging and emphasizing the spectator as co-creator in a social public place. To date, the crowds concept has been explored in two ways; first, with the crowd as an entity, collectively voting or judging at sports or rap competitions, and second, with spectators given small LED devices (wristbands or hats) at concerts or themes parks to give them the experiential quality of participating in a crowd. However, in latter cases the crowd participants have no possibilities to interact with the technology or actively participate in the event: rather than participants or performers of the event, they become objects wearing the technology. In this light, the increasing focus on performativity in HCI—seeing the spectator not as the consumer of an event, but rather co-creator or participant in it—is interesting. Technology of this kind is designed to support active involvement and participation and to diminish the traditional performer—spectator distinction. This distinction becomes relevant when designing for technology-supported crowd experiences.
3 Positioning the contribution

In this chapter I position my contribution within the experience-oriented design approach to interaction design. I will begin with an introduction to current perspectives on crowds and experiences in interaction design.

The distinct sociality of crowds remains relatively unexplored territory in the field of Human-Computer Interaction (HCI). To date the tendency has been for HCI researchers to view a crowd like other kinds of social gatherings or groups that are characterized as having rational and reflective behaviors. However, the Arab Spring, riots in Europe, and festive events have demonstrated that technology-supported “non-rational” crowds are becoming a larger part of peoples’ everyday lives (see chapter 4). To design interactive technologies for such crowds requires an understanding of the dynamics and activities that characterize the crowd as a non-rational gathering.

Through this I will reveal why crowds primarily are considered as rational entities in HCI. I begin my consideration of HCI development for crowds with a look at how the discipline of HCI moved from a focus on single-user experts to group collaboration, and how this shift in focus may has affected its approach to crowds. I will then position interaction design as an interdisciplinary field concerned with designing technologies for peoples’ lived lives and social relations. This will be followed by an account of the experience-oriented design approach within interaction design, which underpins my understanding of crowd experiences. Finally, I position the contribution of this dissertation in the experience-oriented design approach within the field of interaction design.

3.1 HCI—groups and crowds as rational entities

Within the field of HCI, crowds have been attributed with similar social structures to other types of social gatherings or groups. Recently, concepts such as crowd sourcing and crowd founding have gained attention as HCI researchers explore how distributed crowds may solve large and complex tasks (e.g. Gerber & Hui 2013; Hara et al. 2013). Traditionally, HCI has been driven by a scientific rationalistic perspective on technology in which computers have been designed to support and solve goal-oriented tasks in professional environments (e.g. Grudin 1990; Winograd 1997). However, investigating technology-supported crowd experiences challenges these rationalistic perspectives because crowds have a distinct sociality that cannot be understood from the standpoint
of a rational forethought (chapter 4). In order to understand my conceptual understanding of crowd experience it is first necessary to consider why rationalism generally has directed HCI design, including much recent work on crowds that views these gatherings as rational entities.

Over the past 50 years, HCI has developed into a rather broad interdisciplinary field, which has been influenced by engineering, computer science, information systems, psychology, and philosophy in order to accommodate the challenges of the new emergent relations between users and interactive technology (for overview see Rogers 2004). Grudin (1990) is one commentator on the field who has provided a historical overview of how the relations between the computer interface and the user have developed within HCI. In his opinion the computer interface interaction has gradually moved outwards from being (1) hardware based in the 1950s, to (2) programming tasks, to (3) terminal based, then (4) interaction dialogue, and lastly to the (5) collaborative work situation in the 1990s. What is notable about this progression is that, throughout, the technology has been considered a tool for solving tasks.

The field of computer-supported collaborative work (CSCW) can be considered a development of Grudin’s fifth perspective on social computing. Within CSCW attention has been devoted to the design of interactive technologies that incorporate contextualized, organizational, and social knowledge. This focus on collaborative work settings challenged the traditional HCI perspective that tended to concentrate on single-user technologies. Developing technology for groups and social contexts was found to be different from single-user developments (Grudin 1994, p. 93). CSCW has become an established field of HCI research, which incorporates related interests such as social contexts and groupware (e.g. Finholt et al. 2012). The area that is also attracting growing attention of HCI researchers is one that lies outside the workplace environment: collaborations and group interactions in new domains such as public- and semi-public places (e.g. Marshall et al. 2011; R. Taylor et al. 2009). Harper et al. (2008) take up the story of HCI’s development from where Grudin finishes in the 1990s. They add what could be considered as a further two levels to Grudin’s five historical HCI foci: Our contemporary era—the mobility era where there are several computers per user—and the ubiquity era where there are thousands of computers per user, which could be aligned with Weiser’s (1991) vision about the invisible and ubiquitous computer.

Still, even with these additional ways of conceiving HCI, Harper et al. (2008) tend to focus on the individual. Meanwhile other HCI researchers are turning their attention to how crowds and computers may interact. Here, crowds are often conceived as collectivities made up of distributed resourceful individuals who raise money for crowd funding projects (e.g. Gerber & Hui 2013; Greenberg et al. 2013; Muller et al. 2013), solve problems, or carry out tasks in crowdsourcing projects (e.g. Gupta et al. 2012; Hara et al. 2013; Komarov et al. 2013; Ouyang et al. 2013). This conception of crowds as an entity that consists of distributed resourceful individuals who can solve huge complex tasks or collect funding for projects seems like a natural evolutionary step for HCI, if the discipline’s history is taken into account. The crowds is considered as a large collaborative group
working towards a defined and shared goal—the difference in conception to groups primarily relies on the social quantity rather than quality. In other words, groups and crowds are essentially treated the same; the difference is in the numbers of individuals working towards the shared goal. There are, however, different ways of conceiving crowds, one of these being the crowd as a spontaneous and non-rational phenomenon. In the literature there are examples of HCI research which has addressed this kind of crowd, but the focus has tended to be on visualizing, simulating, and predicting crowd behavior with a view to crowd control in critical situations (e.g. Larsen et al. 2013; Morrison et al. 2009; Ying-yin Lin & Ying-ping Chen 2007). However, there seems to be very little research that explores the experiential potential of crowd technology.

What I emphasize here is that the historical perspective on technological systems within HCI has affected the development of interactive technology during the last half-century in the workplace. Furthermore the perspective may still be inherited in how the purpose of interactive technology primarily is conceived and appreciated in the new emerging domains beyond the workplace. There are, however, researchers in interaction design and experience-oriented design, that explore alternative perspectives where the focus is on humans and human relations rather than on technologies as utilities, and it is within this body of work that I situate my research.

3.1.1 Interaction design as an interdisciplinary field within HCI

The publications by both Grudin (1990) and Harper et al. (2008) recognize that computers have moved further into new domains of peoples’ lives. The tradition of HCI may have been to focus on the technological and computational aspects of computers and technology, but the expansion of technology beyond workplaces and into new domains calls for more interdisciplinary approaches to HCI. The emerging interdisciplinary field of interaction design has developed from this need to accommodate the new challenges and concerns of designing interactive technology for peoples’ everyday lives (for an overview see Rogers 2004). Winograd, who arguably was the first to establish the notion of interaction design argued for a shift in perspective “from seeing machinery to see the lives of people using it.” (Winograd 1997, p. 160). And Buchanan (2001) stressed the need to focus on the relations that are mediated by interactive technology instead of the technology it self. The focus within interaction design is on “how human beings relate to other human beings through the mediating influence of products. And the products are more than physical objects. They are experiences, activities or services, all of which are integrated into a new understanding of what a product is or could be.” (Buchanan 2001, p. 11). In order to design for the full range of human experience and relations, the field of interaction design within HCI has taken an interdisciplinary turn. Researchers have embraced that interaction design is to design interactions rather than technologies (Winograd 1997, p. 157). It is not sufficient to understand the technology, designers also need to understand and reflect upon the cultural, socio-political, and experiential implications of technology for peoples’ lives (Löwgren & Stolterman
Further developments and a continuing import of new theoretical foundation into interaction design seems to be evermore relevant as more interactive technologies support new types of interactions and experiences (Rogers 2004, p. 135). Introducing new disciplines into interaction design might further or establish new understandings of situations, experiences, and phenomena, such as technology-supported crowd experience at sporting events.

The interdisciplinarity of interaction design seems of special relevance to my contribution. I agree there is a need for an interdisciplinary approach to interaction design in order to understand interactive technology in new and emergent domains. In relation to my dissertation I introduce sociological crowd theory into the field of interaction design rather than contributing to crowd theory, per se. Therefore, I describe my contribution as multidisciplinary rather than interdisciplinary because I introduce sociological crowd theory to generate new knowledge about technology-supported crowd experiences within the field of interaction design.

### 3.2 Experience-oriented design within interaction design

Understanding technology-supported crowd experience requires a clarification of the epistemological perspective of experience that underpins this dissertation. There may be little published research in the HCI arena on crowds’ distinct sociality and technology-supported crowd experiences, however there are studies on the experience-oriented design approach within interaction design, which provide a theoretical foundation for understanding individual and social technology-supported experiences. Although these do not address crowd experiences specifically, the theoretical contributions still provide an epistemological foundation for technology-supported experiences that I use to develop the conceptual understanding of crowd experiences.

Over the last decade, an increasing number of researchers have begun to explore the interactive technologies that are becoming an ever-greater part of peoples’ everyday leisure lives. Museums (Ciolfi & Bannon 2012), concerts (Barkhuus & Jørgensen 2008; Freeman 2008), cinemas (Maynes-Aminzade et al. 2002), nightclubs (Hook et al. 2011), sporting events (Bentley & Groble 2009), and public places and institutions (Eriksson 2010; Fischer & Hornecker 2012) among others, have implemented interactive technologies to support new types of experiences. HCI researchers working in this area are increasingly exploring “non-work, non-purposeful, and non-rational” perspectives of interactive technology, which have been described as the third wave of HCI (Bødker 2006).

Different design approaches explore these qualities from different epistemological perspectives. Udsen & Jørgen (2005) outline four general approaches that address emotional and experiential aspects of interaction design: cultural, functionalistic, techno-futuristic, and an experience-oriented approach. The experience-oriented approach has dominated the field of interaction design with its holistic approach to technology-supported experiences. Experience-oriented design primarily concerns designing for
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“the full range of” people’s lived and felt experiences, rather than usability, efficiency, or computation (Winograd 1996). This has been addressed in a variety of ways by exploring interactive information systems (Shedroff 2001), enjoyment (Blythe et al. 2004), aesthetics of interactions (Petersen et al. 2004), felt life experiences with technologies (McCarthy & Wright 2004), and technology-mediated co-experiences (Forlizzi & Battarbee 2004). The common epistemological foundation of these contributions is their pragmatist perspective on experience, which primarily draws on the work of the American philosopher John Dewey (1929; 1980; 1997). According to Dewey, experiences are holistic lived experiences that are embodied in a situation. Experiences are constructed in the relationship between an object and a person engaged in a situation investing resources, interests, and values (McCarthy & Wright 2004, p. 17). Knowledge, emotions, language, and actions do not exist a priori and are thus meaningless without a person’s thoughts and actions engaged and invested in a situation (Wright & McCarthy 2010, p. 14). The approach of experience-oriented design aims to provide a new perspective on “seeing experience with technology: as creative, open, and relational, and as participating in felt experience” (McCarthy & Wright 2004 p.x). In relation to my dissertation I find the epistemological perspective on experience within pragmatism relevant in order to establish an understanding of crowd experience. The pragmatist perspective on experience both seems relevant and aligns with sociological crowd theory (which I argue for in chapter 4) and the findings from my field studies at sporting events (chapter 6). However, to nuance the pragmatist perspective in relation to crowds, I will in chapter 4, engage Bakhtin’s accounts of the experience of participating in a carnival crowd.

3.2.1 Aesthetics and sense-making in experience-oriented design

Technology-supported experiences have been addressed through different concepts within experience-oriented design. I refer to the aesthetics of interactions, aesthetic experiences, and sense-making as these concepts are central to an understanding of experience as a phenomenon that is actively constructed, which also is the case for crowd experiences.

Petersen et al. (2004) argue that designing for experiences could be approached through the concept of aesthetic interactions. They build their theoretical foundation on Shusterman’s (2000) and Dewey’s (1929; 1980; 1997) pragmatist aesthetics, and develop three central aspects that should be considered when designing for aesthetic interactions: a socio-cultural aspect, designing for both the mind and body, and an instrumental aspect. They emphasize that it is meaningless to consider aesthetics to exist in the technology itself, but that technology might contain an aesthetical potential that can be released in use. Thus, designing for experience through aesthetic interactions invites people to actively engage in constructing sense and meaning in a situation (Petersen et al. 2004, p. 271). Similarly, McCarthy and Wright (McCarthy & Wright 2004; Wright & McCarthy 2010) argue for a phenomenological understanding of technology-supported experiences emphasizing that aesthetic experiences are actively constructed in the “interplay between
sensation, emotion, intellect and action situated in a particular place and time.” (Wright & McCarthy 2010, p. 14). To further their holistic approach to aesthetic experiences they present four intertwined threads of experiences: a compositional, sensual, emotional, and a spatio-temporal thread (McCarthy & Wright 2004). To McCarthy and Wright (2004), meaning and sense-making are central to in their conception of aesthetic experiences. Like Petersen et al. (2004), they argue that experiences do not exist in themselves, but are actively constructed by how we make meaning of our experiences—“reflexively and recursively” (McCarthy & Wright 2004). An experience's meaning is constructed through six sense-making processes: anticipating, connecting, interpreting, reflecting, appropriating, and recounting (McCarthy & Wright 2004, pp. 124-7). The significance, meaningfulness, and richness of our experiences are shaped in the actively engaged processes of sense-making.

Within experience-oriented design, concepts of aesthetics, sense-making, and engagement have been explored through design of interactive technology. What characterizes these concepts is the epistemological alignment that experiences do not exist a priori in the world but are actively constructed in the interrelation between a particular situation, an engaged individual, and the technology. Thus, it is not possible to design aesthetics, meaning, or engagement using interactive technology. Instead it is only possible to design the experiential potential of the interactive technology by having a special sensitivity towards the aesthetic experience and sense-making. Although these concepts do not directly relate to crowd experiences they share the same epistemological foundation of experiences. Experiences, whether they are of the individual or a crowd, do not exist a priori in the world but are constituted by the active involvement of people.

3.2.2 Collective experience as one type of social experience

Within experience-oriented design there has been a focus on technology-supported social experiences. In particular, social experiences have been addressed as what I term collective experiences that are constituted by reflective behavior, such as collective sense-making and meaning negotiation. Although, the emphasis has been on how experiences are actively constructed by an individual's engagement as a solitary process, experiences are in their nature social. As Wright and McCarthy state, “making sense of the world is irreducibly social” (Wright & McCarthy 2010, p. 19). To Wright and McCarthy, experiences may become social through peoples' continuous reflections and evaluations of their experiences. Even if people experience something while alone, they reflect and evaluate it from a socially empathic standpoint: they think of their experience in relation to how others would think of the experience if they also were present in the situation (Wright & McCarthy 2010, p. 20). Thus, experiences are social in their nature because they are reflected upon and their meaning is constructed in relation to others (McCarthy & Wright 2004, p. 110). But, experiences also become collective when people share their experiences with others by formulating them as narratives. This process of recounting experiences is a process of creating meaning of an experience. Narratives of experiences are not accounts of what has happened, but are constructed, shaped, interpreted, and
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framed for a specific “audience”. People edit their experiences, by emphasizing and leaving things out of the narrative (McCarthy & Wright 2004, p. 119).

Forlizzi and Battarbee argue that experiences are “the constant stream of ‘self-talk’ that happens while we are conscious” (2004, p. 263). But in situations where experiences are “lifted up” and shared with others they have the potential to become social co-experiences. Co-experiences are experiences where the meaning of the experience is negotiated with other people. When sharing experiences, people have the potential to lift up, reciprocate, or reject experiences as meaningful (Battarbee & Koskinen 2005, p. 8). What Battarbee and colleagues (e.g. Battarbee 2003; Battarbee & Koskinen 2005; Forlizzi & Battarbee 2004) argue is that interactive technology has the potential to mediate these social negotiations of meaningful experiences.

To better understand experience of social interactions in public and semi-public places, Ludvigsen (2005) presents a conceptual framework of social interaction by building upon Goffman’s (1963) interactional framework. Ludvigsen (2005) presents four levels of social engagement in public places: distributed attention, shared focus, dialogue, and collective action. The level of dialogue aligns with Forlizzi and Battarbee’s (2004) concept of co-experience where meaning is negotiated through technology-mediated interactions. However, Ludvigsen furthers the concept of co-experience by adding the fourth and highest level of social engagement, which he names collective action (Ludvigsen 2005, p. 399). Collective action is a state where people feel that they are a part of an entity, working and collaborating towards a shared goal, for example when people are brainstorming at a meeting. Furthering the concept of collective experiences with interactive technology, Krogh & Petersen. (2008) state that neither Battarbee and colleagues (2003; 2005; 2004) nor Ludvigsen (2005) focus on peoples’ social experiences of co-located interactions. They argue that the physical proximity of people has the potential, not only, to foster interactions between people mediated by technology (human—technology—human) but also to support collective interactions and relations among people not mediated by technology (human—human—technology) that may emphasize peoples’ experiences when interacting.

These accounts of experience contribute to the conception of technology-supported experiences as actively constructed by situationally engaged individuals. Whether it concerns individual experiences or collective experiences these contributions establish the understanding of meaning as constructed by peoples’ constant stream of self-talk and by their process of sense-making, reflection, and in relation to other people when meaning is collectively negotiated.

3.3 Crowd experiences a contribution within experience-oriented design

In the preceding sections I have accounted for the historical development of HCI with a focus on the discipline’s scientific heritage in computer science and engineering. As I have argued this has traditionally been driven by a rationalistic and utilitarian perspective
on interactive technology that has focused on solving problems. This perspective has also affected how crowds have been explored in HCI. So far, the vast majority of research has viewed crowds as resourceful entities that collaborate in order to reach a shared goal. Crowds have been treated as if they have the same social structure as groups at workplaces or in public places. Only recently have research been published that aim at embracing crowds in different ways (e.g. Barkhuus & Jørgensen 2008; B. Brown et al. 2009; Reeves et al. 2010; Sheridan et al. 2011). Based on empirical analysis of spectators at a sports bar, Reeves et al. (2010), for example, have highlighted five concerns that should be considered when designing interactive technology for crowds, in particular. Although these concerns reflect a view of the crowd as a collective whole they also emphasize their concerns over the tendency for the homogeneity of crowd behavior to be overplayed. (Reeves et al. 2010, p. 399). In relation to this dissertation the conception of a participative crowd is especially interesting, as it aids understandings of social and participative experiences. These contributions explore minor and isolated aspects of what relates to crowds’ distinct sociality.

Returning to the experience of participating in a crowd. I find that the epistemological stance of experience-oriented design provides and furthers the understanding of technology-supported experiences for peoples’ everyday and social lives. However, this approach investigates experiences from a perspective of reflection that addresses experience as a constant stream of self-talk (Forlizzi & Battarbee 2004, p. 263), how we recount experiences (McCarthy & Wright 2004), negotiate meaning of experiences (Forlizzi & Battarbee 2004), collectively collaborate towards a shared goal (Ludvigsen 2005), or being physically co-located when collaborating (Krogh & Petersen 2008). But the experience of participating in a crowd is different as it is driven by its own non-rational social dynamics. As I will argue in chapter 4, a crowds’ sociality is distinct due to the behavior that spontaneously emerges and is contagiously imitated, without a defined or rational orientation. Thus, when Bødker (2006, p. 2) states that the third wave of HCI is about designing for the “non-rational”, it seems that considering crowds’ distinct sociality would be one step towards this third wave of HCI. The current focus of experience-oriented design does not yet include conceptual understandings of technology-supported crowd experiences. It is the aim of this dissertation to unfold this potential and explore the distinct experiential qualities of technology-supported crowd experiences.

To briefly clarify and emphasize the positioning of this dissertation’s contribution: The epistemological foundations of this dissertation lie in the experience-oriented design approach of interaction design within HCI. Positioning the contribution within HCI and interaction design emphasizes my research’s grounding in interactive technology, while acknowledging its multidisciplinary nature, apparent in its references to sociological crowd theory, psychology, philosophy, and aesthetics. This combined approach opens the way to a deeper understanding of technology-supported crowd experience within the experience-oriented design approach of interaction design.
4 Crowd theory and its relevance for experience-oriented design

Designing interactive technology for crowd experiences is a novel quest within experience-oriented design and within HCI in general. As I will argue throughout this dissertation, designing for the crowd is distinctively different from designing for collective experiences. Crowds are distinct both in relation to their sociality and their emergent and imitative behavior, which requires the introduction of a conceptual understanding of crowds within experience-oriented design. In this chapter, I establish a conceptual understanding of crowd experience as a unique and distinct phenomenon that is still unexplored within experience-oriented design. I do so by marrying suggestive crowd theory and pragmatist philosophy on experience.

Sociological crowd theory primarily explores the behavioral dynamics of the collective actions and activities within the crowd—how people imitate each other’s behavior. The experiential qualities of participating in the crowd—the feeling of being a part of a large united whole—have not been of primary concern within sociology. I therefore turn to pragmatist philosophy on experience, voiced by Bakhtin (1984b), to link the dynamics of crowd behavior with the experiential qualities of participating in crowds.

In order to establish the concept of crowd experience, I will first provide an understanding of crowds as a distinct sociality by drawing on a theoretical grounding in suggestive crowd theory. I point to imitation and emergence as two central crowd dynamics which I aim to marry with a pragmatist perspective on experience. This is done to establish an understanding of crowd experience that promotes a sense of a we-phenomenon and a capricious potential. Finally, I conclude the chapter by arguing that crowd theory is highly relevant in the field of experience-oriented design to further the understanding of the distinct experiential qualities of crowds.

4.1 Crowds as a distinct sociality

The crowd has been recognized as a sociological phenomenon for more than a century. Crowds have a distinct sociality that differs from those of groups or other social gatherings. Recently, crowds with a political agenda regained academic attention with the Arab Spring (Eltantawy & Wiest 2011), the Occupy Wall Street movement (Ossewaarde 2012; Rohgalf 2013), and riots in London (Borch 2013), Sweden and France (Borch &
Knudsen 2013, p. 110). Besides political crowds, people also participate in **festive crowds** in their everyday life, when attending sporting events, festivals, and concerts. The crowds as a phenomenon have never gone away. With our increasingly technology-supported everyday life (McCarthy & Wright 2004), technology is now becoming an inherited part of these festive situations (e.g. Barkhuus & Jørgensen 2008; Gates et al. 2006; Slater 2012; Torrez-Riley 2012). New technological opportunities could come to support the crowd phenomenon in new spaces and new constellations that have not been encountered before. Whether in political or festive crowds, the interactive technology that people are surrounded by and interact with is becoming an even larger and more dominant part of activities in crowds (e.g. Axford 2011; Baker 2012).

Before going further, I want to establish the conceptual scope of the crowd in this thesis. There have been various different theoretical approaches to address different types of collectivities—mobs (Ross 1908), masses (Baudrillard & Maclean 1985), multitudes (Mazzarella 2010), swarms (Ying-yin Lin & Ying-ping Chen 2007), and tribes (Maffesoli 1996). However, I use the notion of **crowd** as it is used in the context of suggestive crowd theory (e.g. Le Bon 2001; Tarde 2010b), which forms the theoretical foundation for crowds in this dissertation. Perspectives and semantics on crowds5 range from the European tradition of suggestive crowd theory6 (exploring uninhibited collective and emergent behavior in the crowd) to an American tradition (exploring crowds with rational forethought). These two schools of crowd theory are primarily informed by differing understandings of the crowd phenomenon in sociology and social psychology. Suggestive crowd theory primarily focuses on contagious imitations and emergent behavior as distinct crowd dynamics, while the American tradition of crowd theory has a more individualistic and rationalistic attitude to crowds (Borch 2012). The epistemological concerns explored in the American tradition can in many aspects be aligned with the rational perspective on groups and crowds explored so far in HCI, while the European tradition’s concerns have not yet been of primary interest.

The following sections present an epistemological backdrop to the differing perspectives of suggestive and American crowd theory. It is hoped that this will illustrate how the distinct sociality of crowds has yet to be explored in the field of experience-oriented design.

### 4.1.1 Rational perspectives on crowds

The American tradition of crowd theory has a liberal and rational attitude to crowds (Borch 2012, p. 124). These rational perspectives on the crowd were first articulated in the latter half of twentieth century in the field of American sociology. With the developments

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5. See Borch (2012) for an extensive discussion of the history of crowd semantics.

6. The European tradition I refer to here can also be characterized as “classical” crowd theory primarily voiced by scholars such as Le Bon (Le Bon 2001), Tarde (Tarde 1962; 1968; 2013), Simmel (Simmel 1950), among others. The primarily concern within this tradition is concepts of hypnotic and contagious suggestions (Borch 2012, pp. 17,80).
Crowd theory and its relevance for experience-oriented design

of the sociological sub-fields of collective behavior and social movement, the consideration of crowds as a distinct sociality slowly vanished. In these sub-fields, in contrast to suggestive crowd theory, crowds are not considered as a distinct sociality facilitated by contagious and suggestive behavior. Rather, the American tradition aligns crowds with other social groupings driven by a rational forethought. Crowd participants are seen as rational decision-making individuals who behave like individuals outside a crowd (Berk 1974). According to this rational approach to crowds, people participating in crowds are self-contained individuals with their own willpower and rational goals (Borch 2012, pp. 264–265). Thus the American tradition argues that the crowd has the potential to be a social construction that could free individuals from undemocratic conditions and promote new, more progressive institutions by means of collective achievement (Borch 2012, p. 124). Rather than irrationality, spontaneity, and contagion, here the crowd is an expression of a potential for liberalization and the “creation of new modes of socialities” (Borch 2012, p. 20).

4.1.2 Reviving suggestive crowd theory

In the last half-century, the European school of suggestive crowd theory has been rather neglected in sociology; American sociology has gained increasing attention, with its liberal, rational attitude to crowds. The lack of interest in suggestive crowd theory in contemporary sociology may according to Borch (2012, p. 2) be due to the fact that these types of crowds are no longer perceived as contemporary social phenomena as they were in the post-revolutionary and post-world war periods.

However, as I argued above, crowds are still a part of peoples’ technology-supported everyday life, whether it is in crowds with a political agenda or in a festive context. In order to encompass these technology-supported crowd experiences, suggestive crowd theory offers a relevant theory that furthers the understanding of imitative and emergent crowd behavior. Furthermore, I follow Borch’s (2012, p. 58) statements that suggestive crowd theory offers a scope for more positive appreciations of crowds. Recently, both sociopolitical and scholarly developments have spurred a revival of suggestive crowd theory (e.g. Barry & Thrift 2007; Borch 2005; Borch & Knudsen 2013; Sampson 2012). Tarde’s sociological theory in particular (e.g. Tarde 1899; 1962; 1968; 2013) has gained increased attention in the revival and postmodern reinterpretation of the distinct sociality of crowds (e.g. Borch & Knudsen 2013; 2013, p. 10; Brighenti 2010). Of course, much nineteenth-century crowd theory is rather normative biased in considering crowds as destructive entities that are to be hindered and restricted. Revisiting suggestive crowd theory should therefore not be done by “reapplying” and “dusting off” but by reviving the theory through investigations of new concepts of crowds (Borch & Knudsen 2013). When I point to the revival of suggestive crowd theory, it is to inform experience-oriented design with a conceptual understanding of the distinct sociality of crowds—to discuss how interactive technology can support crowd experiences.

The European tradition of suggestive crowd theory presented here primarily concerns the concepts of hypnotic, contagious, and suggestive aspects of participating in crowds.
This tradition emerged in the wake of the French Revolution in reaction as an attempt to understand and diminish riotous crowds in urban environments (Borch 2012, p. 24). European scholars such as Gustave Le Bon (2001) and Gabriel Tarde (1962; 1968) have greatly influenced what could be characterized as classical crowd theory. This perspective on crowds is mainly driven by a particular interest in the crowd as a “pure” social phenomenon (Simmel 1950, p. 35). The crowd here is constituted by behavior that is contagiously and immediately imitated by its participants so as to cause a near-hypnotic state in which new and unforeseen behaviors spontaneously and autonomously emerge. In other words, participants in a crowd might immediately imitate the behavior of others without rational or reflective forethought just because they are carried away by the crowd. This extreme social state, in which crowd participants imitate each other’s behavior without reasoning, creates a potential for the spontaneous emergence and subsequent imitation in its turn of new and unforeseen behavior in the crowd. At sporting events a small crowd might initiate singing and dancing in the stands, and suddenly this singing and dancing contagiously spreads to other spectators, who imitate the crowd without reflecting on their behavior—they are just being carried away by the crowd.

It is a general conception among European scholars of suggestive crowd theory that people behave differently in crowds than they would do in other social gatherings or groups (e.g. Le Bon 2001, p. 15). Crowd participants have an eccentric sensitivity and passion that only emerges in the crowd, and which cannot be found in the participants in isolation. Thus crowd scholars argue that the crowd’s contagious, suggestive nature makes the participants momentarily insane so that their normal behavior is transgressed (Tarde 2013, p. 236). People are unconsciously carried away as they become a part of a united collectivity, lured contagiously into somnambulism by the “mind of the crowd”, in which they act, feel, and think similarly (Le Bon 2001, p. 15). In other words, the crowd de-individualizes its participants by means of these contagious suggestive behaviors. This has led crowd scholars to characterize crowd participants as hysterical and irrational. According to Tarde, the crowd brings forth momentary insanity (Tarde 1968, p. 302). Participants irrationally, impulsively, and spontaneously imitate the behavior of the crowd without reasoning (Borch 2012, p. 42).

Unlike the rational and liberal perspectives of American crowd theory, suggestive crowd theory interestingly explores, stages, and articulates the collective, uninhibited, and emergent aspects of crowd behavior that might provide intensified feelings and emotions. What has only recently been identified in the readings of Tarde is his acknowledgment of the energetic engagement and experiential potential of crowds (Tarde 2013, p. 232). Not only can crowds be motivated by hatred, dislike, and loathing; they can also induce feelings such as devotion, adoration, enthusiasm, and engagement. The devotion-motivated crowd—such as a festive crowd—may be driven and aroused by the pleasure of their gathering (Tarde 2013, p. 233). Simmel argues that crowd experiences are “one of the most revealing, purely sociological phenomena where the individual feels himself carried by the ‘mood’ of the mass, as by an external force” (see also Borch 2012, pp. 1-2; Simmel 1950, p. 35). The mutual influences of emotions among crowd participants have
the potential to create “an extreme intensification of feelings” (Simmel 1950, p. 35). With a theoretical starting point in Tarde’s sociology, Kølvraa (2013) argues that crowds can provide individuals with overwhelming affective experiences fundamentally different from what we experience in our everyday and communal life. From a phenomenological standpoint, Canetti (1984) delivers an interesting account of the experience of participating in the crowd. To Canetti, the experiential potential in crowds provides a uniquely liberating feeling of equality and collectivity in the crowd. Thus even though most of these contributions within suggestive crowd theory do not relate directly to the experiential qualities of crowd experiences, they include intersections between crowd behavior and experience. Furthermore, the postmodern revival of crowd theory, with its focus on the positive and experiential potential of crowds, seems to be catalysing a growing academic interest (e.g. Borch & Knudsen 2013; Kølvraa 2013).

4.1.3 The distinct non-rational sociality of crowds

There might seem to be a contrasting difference between suggestive and rational crowd theory in this dogmatic reading of the two different traditions. However, my purpose here is to emphasize the difference in their perspectives on the crowd. This of course risks presenting rather dogmatic accounts. Scholars such as Park (1972) have to some extent balanced the two traditions, suggesting a path to integrate the two competing perspectives. Furthermore, Borch argues that the two traditions should not be seen as a dichotomy between the rational individual and the irrational crowd, but that crowd behavior “should be analyzed as ‘semiconscious,’ that is, as a complex interplay of rationality, on the one hand, and affect, desire and passion, on the other” (Borch 2007, p. 550). I agree with Borch that the two perspectives should not be understood as a dichotomy between rationality and irrationality; the social interplay of a crowd is much more complex than that. It is not that the crowd is irrational, but rather that it could be considered non-rational. The non-rational differs from the irrational, as it is not defined in terms of eighteenth- and nineteenth-century rationalism (Maffesoli 1996, p. 144). Rather, the non-rational concerns other aspects with their own rationality, such as affectual and social experiences. In the context of this dissertation, the aim is to explore suggestive crowd theory as a conceptual understanding to inform the unexplored potential of technology-supported crowd experiences within experience-oriented design as a distinct non-rational sociality.

The reason why these differences and nuances in the two traditions are relevant here is that they help to clarify the epistemological relation to HCI and experience-oriented design and help to provide an understanding of the distinct sociality of the crowd. The American tradition’s perspective on the crowd as rational and liberal social entity aligns with the conceptual understanding of crowds found in current HCI (see also

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7. Elias Canetti’s phenomenological account of the crowd (1984) is a rather unorthodox as he resisted academic scientific procedures. However, his extensive work on describing the crowd from the inside have been widely acknowledged. See Borch (2012, pp. 234–251) for an extensive discussion of Canetti’s work and its academic relevance.
Chapter 3), where crowds are seen conceptually as mere gatherings of resourceful and rational people with no distinct sociality—as with distributed collaborative entities solving tasks through crowd-sourcing or crowd funding (e.g. Chilton et al. 2013; Greenberg et al. 2013; Gupta et al. 2012). This rational perspective on crowds contrasts with suggestive crowd theory’s acknowledgment of the distinct sociality of crowds, driven by the dynamics of contagious imitation and emergence. Here, the concern is on the crowd’s extreme sociality, which almost de-individualizes its participants. In the crowd, people behave differently than they would otherwise do, individually or in other types of gatherings, because they unconsciously get carried away and their emotions and feelings are intensified in the crowd. These types of crowds with a distinct sociality are as yet unexplored within either HCI or experience-oriented design. This presents a potential for further explorations of technology-supported crowd experiences within experience-oriented design.

4.2 Imitation and emergence as dynamics for explorations in interaction design

Although suggestive crowd theory primarily concerns the behavioral aspects of crowds, I will in this section present conceptual hooks in crowd theory to unfolding the experiential qualities of participating in crowds. The aim is to establish an understanding of crowd experience by linking (1) a sociological perspective on crowd dynamics—imitation and emergence—with (2) Canetti’s (1984) phenomenological account of crowds and (3) Bakhtin’s pragmatist perspective on the carnivalesque experience. I bring his account of the carnivalesque experience (Bakhtin 1984b) to the forefront of my thinking because Bakhtin’s account of carnivals emphasizes two central aspects relevant to crowd experiences. From a pragmatist perspective, Bakhtin unfolds the carnivalesque experience of being a part of a crowd that can potentially provide a sense of experiential unfinalizability and equality. Bakhtin’s perspective on the carnivalesque experience has much in common with Canetti’s explorations of crowds. These intersections between Canetti’s phenomenological crowd theory and Bakhtin’s pragmatist perspective on crowds will be utilized to link crowd theory with pragmatist experiences so as to establish an understanding of crowd experience.

I will argue that the reason why imitation and emergence are significant when discussing crowd experience is that they are central dynamics of crowd behavior which induce certain unique experiential qualities such as the feeling of becoming a part of a we-phenomenon and a capricious potential in the crowd: a we-phenomenon in the sense that, once immersed and engaged in imitative behavior, crowd members might be caught by the feeling of being carried away, of becoming a part of something larger than themselves. The experiential quality of the capricious potential exists because of the emergent dynamic of the crowd that may provide crowd participants with a feeling of a spontaneous, unfinalized, and creative potential in the crowd of “anything can happen.” These two experiential qualities are central in my dissertation and design experiments.
Crowd theory and its relevance for experience-oriented design

To Tarde, imitations and inventions are elementary social acts (Tarde 1962, p. 144). The concept of invention is basically a theory of emergence and is interesting in the context of crowds because they have a high inventive potential because of their distinct sociality (Mazzarella 2010, p. 723). It is not that imitation and emergence are exclusive behavioral dynamics of crowds; people imitate and invent in many other situations. Furthermore it is important to stress that emergence, unlike imitation, is not essentially constitutive of a crowd. The reason why both imitation and emergence are central to crowd experience is because of the crowd’s unique social density, which cross-fertilizes imitation and emergence, which in turn intensify an experiential capacity in the crowd. In other words, the crowd’s social density emphasizes the sensitivity towards imitation and emergence in the crowd. Of course, dividing these dynamics into two separate concepts seems artificial; we should think of them as two basic social acts which are mutually interdependent.

4.2.1 Promoting the feeling of being a part of a we-phenomenon through imitation

One of the most revealing experiences is the feeling of being a part of something larger than yourself, where you are carried away by and immersed in a crowd. Sloterdijk (2008) has established the notion of the we-phenomenon, which encompasses the feeling of being a united part of a crowd. As when spectators at a sporting event sing collectively, it is not that it sounds beautiful, but the collective singing creates a special sense of a united coherence among the participants. Even though Sloterdijk points to the acoustic imitations of the crowd, he captures the unique experiential quality of the crowd as a united whole. He characterizes the acoustic noise of the crowd as a “sonospheric melding” in which participants in the crowds feel equal, which creates the state of we-phenomenon (Sloterdijk 2008, p. 55). I argue further that Sloterdijk’s notion of a we-phenomenon is an experiential quality that relates more generally to how emotions and feelings of equality, cohesion, and unitedness are promoted among crowd participants through imitation.

Tarde argues that imitation is basically social and that sociality is imitation (Tarde 1962, p. 87). Imitation is a basic social act; without it, there is no sociality. Imitation is therefore a rather broad concept that applies to society in general: “society is imitation and imitation is a kind of somnambulism” (Tarde 1962, p. 87). Even though Tarde’s sociology of imitation has been used in rather broad terms to describe society in general, it also has been recognized and argued that Tarde’s sociology is “modeled around the notion of suggestive crowds” (e.g. Borch 2012, p. 55; Mazzarella 2010, p. 723).

Imitations flow in a social medium and dependent on a dense “medium” to spread in, and the lack of social density hinders imitation. In other words, the greater the density of people gathering, the greater potential for behavior to be imitated, which makes imitation central to crowds. Behavior in the crowd is imitated almost without mediation and friction in the crowd members’ minds (Tarde 1962, p. 70). This is why Tarde pays particular attention to the city as the domain of crowds (Borch 2005, p. 82). The city is
proportionate to the density of the multiplicity of the relations of its inhabitants (Tarde 1962, p. 239) in here imitations almost unmediated imitated in the dense crowd.

4.2.1.1 Promoting emotions through imitations

Imitation is capable not only of transmitting behavior, but also of promoting and spreading arousal, excitement, emotions, and feelings among crowd members (Kølvraa 2013; Le Bon 2001; Lofland 1982). However, these imitations should not be understood as a purely cognitive or interpsychological transfer between individuals in the crowd. Rather, imitations are “comprises of affecting (and affected) noncognitive associations, interferences and collisions that spreads outward, contaminating feelings and moods before influencing thoughts, beliefs, and action” (Sampson 2012, p. 19).

The physical proximity of crowd participants has the potential for mutually influencing one another by imitations that carry the individual away and promote deep, irresistible and intensified experiences. The individual may be carried away by the “mood” of the mass, so that the individual’s intellect is unconsciously suppressed (Simmel 1950, pp. 35–36). Where Simmel and Tarde explore the crowd from a sociological standpoint, Le Bon’s popular work on the “mind of the crowd” takes a psychological approach (Le Bon 2001). Both sets of authors consider imitation a central concept for the contagion of emotions and feelings in crowds. To Le Bon, contagion plays a central role because “imitation, to which so much influence is attributed in social phenomena, is in reality a mere effect of contagion” (Le Bon 2001, p. 73). Imitation creates a mental unity of the crowd where sentiments, emotions, and feelings are transmitted among it subjects through contagion (Le Bon 2001, p. 74). Le Bon emphasizes that the united mind of the crowd is a provisional “being” constituted by heterogeneous elements in which all feelings and thoughts of the collectivity have a unified and identical direction (Le Bon 2001, p. 15). Le Bon’s primary concerns relate to the hypnotic and somnambulistic power of the crowd, as emotions, feelings, and mood contagiously spread among its participants beyond the scope of reason. Even though these accounts are rather conservative and negative, there have been more positive attitudes expressed towards crowds’ potential to provide amusing, exciting, and joyful experiences. Lofland (1982) argues that certain aspects of the crowd affect and promote the joyful crowd experience. He points to how the crowd stages joy and emotions through participants’ performative behavior. The crowd is a rather visible entity, which constitutes and stages “its” mood through its expressive behavior. He furthermore points to how the generalized imitative behavior in the crowd has the potential to diminish or eliminate the “audience—performer” distinction through the crowd’s united behavior (Lofland 1982, p. 357).

4.2.1.2 Being a part of a united whole

In addition to its contagious, promoting, and intensifying effect, imitation also has the potential to provide an experience of being a part of a coherent, equal, and united whole. Of course the sense of coherence and equality relates to the feeling rather than
an actual state of the crowd. But participating in the crowd imitating one another's behavior contributes to the experience of being a part of a united whole.

The crowd as a united whole can be staged by its rhythmic imitations. The repetitive rhythmic movements (Canetti 1984) and acoustics (Sloterdijk 2008) are essential behavior that organize and stage the unity of the crowd both internally and externally (Borch 2005, p. 95; 2009b, p. 11). Internally, the crowd's imitative repetitions create a “specific state of communal excitement” that potentially can reach “frenzy” and a feeling of unitedness within the crowd (Canetti 1984, p. 31). Even though the crowd participants, according to Canetti, desire to become a united whole, the minor variations in their movements, chants, or songs gives the participants an even more enhanced phenomenological awareness of and excitement at their collectivity (Canetti 1984, p. 31). Externally, the repeating rhythmic imitations have an essential magnetizing effect on the participants and on the surrounding people, who are drawn into the crowd to participate (Canetti 1984, p. 32). The rhythmic imitations are part of the self-representational aspect of the crowd in that participants construct, stage, and perform their unity for themselves and to the outside, which only emphasizes their own awareness of their united whole.

The physical proximity of crowd participants’ bodies, and their phenomenological awareness of being a part of a united whole, provide a certain bodily, liberating experience. Canetti (1984) states that there is “nothing man fears more than the touch of the unknown”, but it is only in the crowd that men become free from this fear. The physical proximity of the bodies in the crowd provides a unique feeling of equality, which eliminates the distinctions between individuals: it is as if “everything were happening in one and the same body” (Canetti 1984, p. 16). It is in this feeling of equality within the crowd that “fear changes into its opposite” (Canetti 1984, p. 15). The physical density of the compact crowd constitutes the unique feeling of equality among crowd participants whose bodies are touching one another’s. Bakhtin too assigns the physical proximity and density of the crowd a unique experiential quality, whereby “... the pressing throng, the physical contact of bodies, acquires a certain meaning. The individual feels that he is an indissoluble part of the collectivity, a member of the people’s mass body” (Bakhtin 1984b, p. 255). To Bakhtin, the physical proximity of the collective bodies in the crowd provides the experience of a coherent and united whole among the crowd participants. In this coherent and united whole, the social hierarchy of people’s everyday life is abandoned: all are equal, no matter what gender, social and economic status. Participating in the crowd provides the experience of being liberated from people’s “primary world” and official, controlled everyday life. Within the crowd, the feeling of freedom and equality has the potential to unfold (Bakhtin 1984b, p. 89). As Canetti argues, the crowd gives to its participants the unique feeling of being equal: “It is for the sake of this blessed moment, when no one is greater or better than another, that people become a crowd” (Canetti 1984, p. 18). It is this equal relation among the crowd participants that creates a utopian and idealistic relation that is not possible in everyday life, but in the crowd becomes real (Bakhtin 1984b, p. 16). The unique crowd experience is the liberating idealistic, yet realistic sociality. The experience of freedom in the crowd may temporarily
transcend peoples’ everyday life by entering a “sphere of utopian freedom” (Bakhtin 1984b, p. 89). As Bakhtin stages the unique crowd experience:

People were, so to speak, reborn for new, purely human relations. These truly human relations were not only a fruit of imagination or abstract though; they were experienced. The utopian ideal and the realistic merged in this carnival experience, unique of its kind (Bakhtin 1984b, p. 10)

Here the utopian and yet realistic experience of momentary equality and freedom as described by both Canetti and Bakhtin are emphasized.

4.2.1.3 Becoming a we-phenomenon

Imitation is a central behavioral dynamic to crowd experience because it has the potential to affectively promote the experience of being a part of a we-phenomenon. Imitative behavior in the crowd can be seen as the dynamic that is causing it to appear united and coherent both internally and externally (Kølvraa 2013, p. 122). It is important to notice that imitation should not be thought of as a dynamic that injects or transfers emotions through the crowd, but rather as “releasing or ‘getting off’ an affective potential already in and of the body” (Kølvraa 2013, p. 126 italics in original). The overwhelming affective potential of crowd experiences is created by the physical proximity of the imitating individuals who constitute the body of the crowd. Following Kølvraa (2013, p. 123), I emphasize that it is not that crowd participants are of one unified collective mind or body, but that the crowd can be conceptualized as a united body with no ego at all. Emotions in the crowd are “the contagious extension of a collective loss of subjectivity” (Kølvraa 2013, p. 130). This is not de-subjectification, more a case of members of the crowd being subject to an overwhelming feeling of being part of a united whole and of a “loss” of oneself (Kølvraa 2013, p. 123). The crowd experience is a symbolic and utopian feeling of being an equal and united whole. Canetti points to the temporary nature of the crowd and the illusionary and utopian feeling of equality: “It is based on an illusion; the people who suddenly feel equal have not really become equal; nor will they feel equal forever” (Canetti 1984, p. 18). Whether or not the equality and freedom is illusionary and utopian, the crux of the matter is the crowd participants’ experience of feeling it. The crowd experience is momentary and transitory, and the feeling of being a part of a coherent, equal, and united whole exists in the crowd constituted by imitative behavior.

Although Sloterdijk discuss the acoustic “melding” of the crowd as a we-phenomenon, this is a concept that emphasizes the crowd experience of collectivity and unified cohesion. The crowd experience is unique in that it is potentially an experience of being immersed in a we-phenomenon in which participants in the crowd feel a part of a united whole of equality and freedom. Utopian as it may be, the feeling of equality, unitedness, and cohesion in the crowd is one of the experiential qualities that constitute this unique yet real experience of a we-phenomenon.
4.2.2 Emergence of the capricious

In classical crowd theory, the emergent behavior of crowds is characterized as spontaneous (Tarde 2010a, p. 154). Spontaneous, unforeseen, and new ways of behaving might emerge in the crowd and transgress the current norms of behaving. As noted earlier, most perspectives on the spontaneous and emergent crowds have been rather conservative and normative. However, I will argue that the emergent dynamic of the crowd could be revived in a more positive perspective with a focus on the crowd’s creative and experiential capricious potential. I follow Sampson’s (2012) revived reading of Tarde’s sociology, which focuses on the capricious potential of the crowd. Crowd spontaneity could be thought of as the inventive driver for capricious outcomes—a capricious potential constituted by a spontaneous, unfinalized, and creative potential in the crowd.

To describe the crowds’ emergent dynamic, I explore Tarde’s sociology focusing in particular on his concept of invention. As with his concept of imitation, Tarde applies invention in rather broad terms, naming it all individual initiatives (Tarde 1962 p. xiv). Thus invention is a basic activity and not reserved to crowds, the crowd’s sociality fertilizes the sensitivity towards the possibility of invention. As previously mentioned, in the context of the crowd, I align Tarde’s general concept of invention with the behavioral dynamic of emergence.  

In Tarde’s theory, inventions are to be understood as combinations of imitations which collide, and new inventions emerge from this collision (Tarde 1899; 2010a, p. 153). Inventions therefore always emerge from something already existing. As Tarde argues, new inventions arise from intersections of previous imitations (Tarde 2010a, p. 153). The potential for the emergence of new inventions is, as with imitations, highly dependent on the social density of the crowd. Social isolation lowers the potential for emergence, while a high social density facilitates the potential for new inventions (T. N. Clarke 2010, p. 26). Inventions emerge and are fertilized by the reciprocal stimulation and exchange of spontaneous and capricious inventions (Tarde 2010a, p. 159). The high, dense sociality of the crowd is therefore highly charged with an emergent dynamic and capricious potential which contrasts with all that is stable, completed, and ready-made.

4.2.2.1 Spontaneity as a creative emergence

Even though Tarde’s exploration of invention is primarily in the sense of individuals inventing great new discoveries, he also acknowledges that inventions often happen spontaneously and unpredictably (Tarde 2010a, p. 154). Inventions are not necessarily something developed through rational choice (Tarde 1962 p. xiv). The unconscious mind, various emotions, and moods also provide great inspiration for creative inventions (T. N. Clarke 2010, p. 24). The inventions that emerge from the collision of imitation happen almost capriciously (Sampson 2012, p. 26). As Tarde states: “The order in which these inventions or discoveries appear and are developed is, in a large measure, merely

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8. For further discussions on how Tarde’s theory on invention is a theory on emergence see Mazzarella (2010, p. 723).
capricious and accidental...” (Tarde 1962, p. 109). However, not all inventions are imitated, and thereby becoming social (Tarde 1962, p. 150). Inventions are exposed to an ongoing process of elimination, guided by people’s desires and dispositions, before they can emerge and become coherent, harmonious, and finally subject to imitation. Therefore crowd participants are not only subject to semi-conscious imitations; they also have the potential to create inventions that emerge capriciously and spontaneously in the crowd.

4.2.2.2 Unfinalized crowd experiences

Both Tarde and Bakhtin point to the emergent character of crowds—Tarde in discussing the crowd’s emergent dynamic as spontaneous, and Bakhtin in addressing the crowd’s emergent dynamic as unfinalized. Bakhtin’s concept of unfinalizability relates to open-ended experiences that emerge in an engaging experiential “dialogue”, that are in opposition to all that is controlled, finalized, produced, and ready-made for consumption (Bakhtin 1984b, p. 11). Where scholars of the suggestive crowd theory tend to have a conservative attitude to the crowd’s emergent dynamic, Bakhtin aestheticizes the crowd’s unfinalizability. Unfinalizability in the sense that everything is in constant change, incomplete, becoming, and ambiguous. The crowd experience has the effect of “plunging certainty into ambivalence and uncertainty” (K. Clarke & Holquist 1984, p. 304). Bakhtin stages this as the grotesque carnivalesque experience that incorporates “all that jolts us out of our normal expectations and epistemological complacency” (K. Clarke & Holquist 1984, p. 312). In other words, crowd experiences are emergent in the sense that they are subject to constant change, so that behavior, emotions, and feelings are created and emerge within the crowd itself. The experience is unfinalized and becoming through the active engagement of the crowd participants.

The notion of unfinalizability leads Bakhtin to argue for the potential of transformations of and liberation from official norms. Crowd experience is a state of the unusual, a “life turned inside out” and an exploration of the “reverse side of the world” (Bakhtin 1984a, p. 122). These liberating, transformative structures played out in the crowd have the potential to facilitate experiences of momentary equality and freedom (Bakhtin 1984b, p. 89). Bakhtin is not alone in arguing that the unfinalizability of crowd experiences can create the feeling of liberation and freedom through the experience of equality in the crowd. Canetti points to the significance of the spontaneous and unpredictable crowd that may provide a unique feeling of freedom in the crowd.

... The spontaneous and never quite predictable outcry of a crowd is unmistakable, and its effect enormous. It can express emotions of any kind; which emotions often matters less than their strength and variety and the freedom of their sequence. (Canetti 1984, p. 35).

As stated by Canetti, it is not the specific behavior or emotions of the crowd that are essential, but the sense of unpredictability and unfinalizability that establish the potential of crowd experience. Crowd experiences are distinct from other experiences evolving in social contexts such as in theaters or cinemas because of the crowd’s emergent dynamic
combined with imitative behavior and its high social density. To Bakhtin (1984b), the crowd is not gazing on a finalized and instructed spectacle on a stage or screen in cinemas. In contrast to other spectator experiences, the “whole crowd is immersed in a communal performance where life patterns are reconstructed in a manner independent of official norms” (Cunliffe 1993, p. 51). The crowd itself becomes its own spectacle through active engagement in the crowd behavior, with the imitative and emergent performance of the crowd becoming an act of self-representation. This furthers our understanding of the crowd experience as one driven by the emergent dynamic providing an unfinalized and unpredictable potential.

4.2.2.3 The capricious potential of crowd experience

Scholars of suggestive crowd theory have characterized crowds as spontaneous in rather conservative and reactionary formulations. However, the emergent dynamics of the crowd provide a capricious potential that is established by their spontaneous, ever-changing, and unfinalized quality. The capricious quality should be understood as “opposed to all that was ready-made and completed, to all pretense at immutability, sought a dynamic expression; it demanded ever-changing, playful, undefined forms” (Bakhtin 1984b, p. 11).

It is important to understand that the capricious quality relates to the experiential structure of the unfinalizability and unpredictability of the crowd rather than its concrete behavior. It is not the concrete behavior of the crowd that is essential, but the unfinalizability of the situation. In other words, it is not essential what behavior the crowd imitates, but that it imitates, in the same that it is not essential what behavior emerges in the crowd, but it is the capricious potential that matters. The crowd’s dense sociality could be considered as a social fertilizer providing an extreme social environment that is not found elsewhere in gatherings or in society. Being in a crowd, feeling the united, almost bodily coherence with fellow participants, combined with the feeling of endless unforeseen possibilities of action, is what constitutes the capricious potential of crowd experience.

4.2.3 Towards a conceptual understanding of crowds

As we move towards establishing a conceptual understanding of crowd experience, suggestive crowd theory provides a theoretical foundation for discussion of the distinct sociality of crowds, the behavioral dynamics of crowds, and the experiential quality of participating in crowds. Although suggestive crowd theory has been challenged by a more rational, liberal attitude to crowds, the consideration of crowds as a distinct sociality still provides an understanding of the non-rational behaviors and experiences that unfold in contemporary crowds and that are not found in other social gatherings and groups. Considering crowds as a distinct sociality contributes with new understandings of social interaction and experiences within experience-oriented design. I aim to establish a conceptual understanding of crowd experience by pointing to imitation and emergence as two central behavioral dynamics of crowds, and drawing links to the
pragmatist philosophy of experience. I have pointed to how imitation has the potential to promote the experience of being a part of a we-phenomenon in the crowd by promoting emotions and a feeling of being a part of a united whole. The crowd’s emergent behavior provides the experiential capricious potential of spontaneity and unfinalizability—in essence, a capricious potential where anything can happen in the crowd. The conceptual understanding of crowd experiences that I aim to establish in this dissertation builds upon these perspectives and concerns—the crowd as a distinct sociality, imitation and emergence as two central behavioral dynamics that promote the experiential qualities of being a part of a we-phenomenon, and the capricious potential in the crowd.

4.3 Crowd theory and its relation to experience-oriented design

The recent revival of crowd theory stages the potential for technology-supported crowd experience within experience-oriented design. The changing attitude to crowds becomes relevant when technology-supported crowd experiences are to be explored. As described in chapter 3, within the experience-oriented design approach the focus has primarily been on designing interactive technology that supports individual and experiences in groups. Experiences in crowds, however, are still unexplored. The theoretical approaches and perspectives that have dominated experience-oriented design relate to pragmatist perspectives on experience and to Goffman’s (1963) sociological framework on interactions and experiences in public situations. These contributions are highly valuable, relevant, and influential within experience-oriented design. However, I argue that the design of interactive technology for crowd experiences challenges these theoretical and epistemological perspectives.

Pragmatist perspectives on experience and aesthetics have contributed greatly to the theoretical foundation of experience-oriented design during the last decade (e.g. Udsen & Jørgensen 2005, p. 211). Although various philosophical contributions on pragmatism have contributed to the development of experience-oriented design (Bakhtin 1984a; Dewey 1980; Shusterman 2000), Dewey’s philosophy seems to have been most influential. However, Dewey’s main focus is not on crowds or the experience of being a part of a crowd. His writings are primarily devoted to discussing democracy, education, art, and experiences in organized and democratizing processes. In other words, Dewey’s main interest is situations in stabilized and organized societies (Dewey 1929; 1980; 1997). It is not that experiences in crowds have been completely neglected within pragmatism: as Bakhtin (1984b) explores the grotesque carnivalesque experience. However, Bakhtin has not gained the same attention in experience-oriented design as Dewey, perhaps because of his more literary approach to pragmatism or because of his interest in more extraordinary and grotesque phenomena such as the carnivalesque crowd. While current research in a social context within experience-oriented design aims to support meaning creation and negotiation in a social context (e.g. Forlizzi & Battarbee 2004; Petersen et al. 2004; Wright & McCarthy 2010). The experiential qualities of a we-phenomenon and capricious potential still remain to be explored.
Crowd theory and its relevance for experience-oriented design

In the analysis of social interactions in public places, most attention has been devoted to Goffman’s framework on behavior in public settings (e.g. Benford et al. 2006; Calvi 2013; Dalsgaard & Hansen 2008; Erickson & Kellogg 2000; Ludvigsen 2005; O’Hara et al. 2008; R. Taylor et al. 2011). However, Borch (2005, p. 91) draws attention to Goffman’s statements to the effect that his framework relates to “ordered” interactions, not to the distinct type of behavior, interaction, and social organization emerging in crowds.

It is well recognized, for instance, that mobs can suddenly emerge from the peaceful flow of human traffic, if conditions are right. But little concern seems to have been given to the question of what structure this peaceful intercourse possesses when mob formation is not an issue. It is the object of this report to try to develop such a framework. (Goffman 1963, p. 4)

The conceptual foundation of experience-oriented design based on Goffman’s framework on experiences in social and public context is therefore rather challenged when social phenomena like crowds starts to become a new locus for interactive technology.

Within experience-oriented design, the focus has been on how technology can support experiences, both individually and in social interactions. In the broader field of HCI, crowds are seen as a rational and resourceful entity collaborating towards a shared and defined goal—as in collectively fund-raising for an entrepreneurial project, or collectively programming to create a service for the crowd to enjoy. These activities follow the structured and goal-oriented activities described by Ludvigsen’s (2005) concept of collective action or group activities. The activities are primarily dominated by rational, reflective activities with predefined and negotiated end-goals.

The imitative and emergent crowd has therefore not been a subject of interest in experience-oriented design, and a theoretical conceptualization of the distinct sociality of crowds has not been established. This leaves experience-oriented design with unexplored potential in establishing a conceptual understanding of crowd experiences—an understanding of social experience that goes beyond reflective behavior and meaning negotiations to focus on the experiential qualities and feeling of being a part of a we-phenomenon, and the capricious potential of the crowd experience.
This chapter presents and discusses my approach to the research question: how can we conceptually understand and design interactive technology for crowd experiences? Investigating this question has been challenging as there are no empirical data relating to design of interactive technology for non-rational crowds from a “non-sanitized” perspective. In order to accommodate this challenge, I have implemented an experimental design research approach to generate knowledge about the not-yet-existing (Nelson & Stolterman 2003) through design research activities, such as field studies, user-centered activities, design experiments, and evaluations. I describe my approach as research-through-design. The aim of my research was to make a contribution to the experience-oriented design approach in interaction design with a conceptual advancement: The introduction of sociological crowd theory into the field of interaction design. This is in line with Stolterman and Wiberg’s approach of concept-driven design research. However, before going further into this I will first account for the different design research activities that have played a part in this study.

5.1 Design research activities

My research has drawn on a range of design research activities. The starting point of all these activities has been in my overarching research program. From the outset there has been a strong conceptual focus on interactive technology that supports social experiences, in particular crowd experiences. Thus, most of my design research activities have been driven by theoretical investigations of interaction design and social and crowd experiences. Although the foci of my projects have varied, the process has been similar for most of my investigations, and has mostly incorporated the following activities:

Empirical field studies: I carried out empirical field studies in the initial phase of the projects to gain fundamental understandings of the domain. These studies were conducted as ethnographically inspired field studies and included participant observations and semi-structured interviews (Blomberg et al. 1993; Kvale 2008). These studies provided empirical data relating to my research question, as well as prompting questions for further investigation. Often I found it beneficial to visit a field situation on more than one occasion in order to deepen my understanding of a particular phenomenon.
**Co-design workshops**: Co-design workshops have been a prominent activity in the various projects where concept generation has been done in collaboration with colleagues or potential users. Most of the co-design workshops have had a co-constructive aspect where potential users have participated in establishing a mutual dialogical learning process with the different stakeholders in the design process. I arranged and participated in these workshops to investigate specific aspects of my research program. The workshops established a space for experimental collaboration, and I was able to reflect on the different perspectives, concepts, and design ideas that came out of these collaborative sessions, as well as use some of the data and implement design ideas.

**Mockups**: Mockups have been developed and explored primarily as an integrated part of co-constructive workshops where they have been created and developed to materialize, maintain, and stage qualities of discussed themes or values (Ehn & Kyng 1991).

**Scenarios**: In collaboration with workshop participants and design researchers, I have created scenarios in the concept-development phases. They have mostly been *indicative* scenarios that aimed to bridge the gap between abstract conceptual constructs and the empirical context of the potential concept (Bødker & Christiansen 1997; Carroll 1999).

**Design experiments and evaluations**: This covers an array of design interventions carried out during the project. These range from preliminary conceptualized experiments that stage mock-ups in dramatized scenarios (E. Brandt 2000) to more experimental technological prototypes. However, I will not characterize any of my design experiments as prototypes (Lim et al. 2008) or proofs-of-concepts as their purpose has been more experimental and conceptual than evaluative. I have worked with colleagues on a number of design experiments and concepts relevant to this study. In connection with these design experiments, I carried out interviews and field studies to gain knowledge about design in context. Afterwards I evaluated and reflected upon these experiments, which helped to deepen my understanding and further my research.

These activities, together, formed part of a highly iterative process where various (and often diverse) research activities contiguously and interchangeably were carried out. To provide a frame for this process I refer to Fallman’s (2008) model on interaction design research. Here Fallman (2008) presents interaction design research as a triangle “expanded” by three types of design research activities: Design practice, design exploration, and design studies. *Research as design practice* is when the researcher is engaged in a particular design situation, designing, forming, and shaping something new. These activities are similar to those often found in interaction design outside academia. *Research as design explorations* has many commonalities with design practice. However, there are some important differences, in particular it is driven by a transcending perspective of exploring the possibilities outside current paradigms of style, use, technology, or economical boundaries, which is often underpinned by ideals and theory. *Research as design studies* relates to contributions made to discussions about design theory, design methodology, design history, and design philosophy (Fallman 2008, pp. 6-9; Fallman & Stolterman 2010, pp. 268-270).
In relation to my research activities, I primarily consider them as design explorations. These activities have been dominated by the pursuit of a new conceptual understanding of technology-supported experiences in crowds. This has been approached, by engaging crowd theory to inform interaction design. As I will discuss further in this chapter, my research approach can be characterized as a *concept-driven design research approach* (Stolterman & Wiberg 2010) where the aim is theoretical—to make conceptual advancements in interaction design—and to a large extent follows Fallman’s (2008) concept of design exploration. However, during my project some of the research activities have related to design practice, in particular the design experiments, which in some regards necessarily have to consider the particular context in which they are deployed. Furthermore, P4 also concerns a methodological experiment and, therefore, it could be argued that my design research activities also include design studies. Although the majority of activities undertaken for this research fall within the category of explorative design, there are some activities that lean more towards design practice or design study. I, therefore, would describe my design research activities as dynamically moving and unfolding within the space of Fallman’s design research triangle (Fallman 2008), rather than only belonging to one form of design research activity.

Although Fallman’s (2008) triangle in some respects provides a model to discuss and distinguish the different forms of design research activities, interaction design research is still rather complex as it concerns the *not-yet-existing* (Nelson & Stolterman 2003, p. 10). In the following, I will further discuss my general research approach in relation to interaction design research.

### 5.2 Interaction design research complexity

In my research I have explored how technology-supported crowd experiences could be understood and approached within the context of interaction design. However, these types of technology-supported crowd experiences do not exist and are thus not yet possible to study empirically. Interaction design research concerns the not-yet-existing future, which in my case is the technology-supported crowd experience. However, in order to qualify interaction design research as a research discipline that unfolds in-between design practice and design research it needs to have the disciplinary rigor of the field of design at its core.

Design is an extremely complex, holistic, and emergent practice, it is not about detailed descriptions of something existing and cannot solely be explored through measurements and controlled experiments. Design practice involves *messy* (Schön 1987) and *wicked problems* (Rittel & Webber 1973) and concerns how to create the not-yet-existing (Nelson & Stolterman 2003), which means it can neither be described nor measured. However, within the field of design research, professional design knowledge, competences, and practices have been discussed and described with various concepts: *professional artistry* as a design skill (Schön 1987); *design ability* as a certain thoughtful behavioral practice in design (Löwgren & Stolterman 2004); *design judgment* as the ability to make actions, judgments, and appropriate changes in design (Nelson & Stolterman 2003, p. 181);
And the concept of designerly as an intellectual way of knowing in design (e.g. Archer 1979, p. 17; Cross 1982; 2001; Stolterman 2008, p. 60). Stolterman (2008) argues that even though a designerly design approach has not been fully matured there still exist “intellectual foundations and fundamentals that support design thinking and acting, and [...] a rigor and discipline in design” that should be taken as the point of departure in design practice (Stolterman 2008, p. 60). Many of these intellectual foundations and fundamentals that exist in interaction design seem to succeed in managing complex and messy situations of design practices. Stolterman (2008), argues that design research should be grounded in these already existing, understandings of designerly ways of behaving, in order to further develop design as a discipline. In my research approach I generate knowledge through design experiments, and designerly integrity and behavior are, therefore, at the center of my design research activities.

Design research is distinct in its nature and should not be compared to the scientific paradigms of natural science and humanistic research. Humanistic research is primarily concerned with human values and expression, and provides comprehensive descriptions of already existing objects and phenomena (Archer 1979, p. 19). Natural sciences are concerned with understanding phenomena based on observations, measurements, and controlled experiments, and the formulation of generalizable theories for further testing. Even though traditional HCI shares its scientific heritage with the field of engineering and computer science, the research paradigm of these traditions is not sufficiently comprehensive to deal with design research’s messy, wicked, and explorative experiments. Krippendorff (2006) argues that the paradigm of natural science is not a good fit for design research. In contrast to natural science, design research is proactive, as it needs to provide tools to explore the not-yet-existing. Krippendorff states that a science for design should be “a systematic collection of accounts of successful design practices, design methods, and their lessons, however abstract, codified, or theorized, whose continuous rearticulation and evaluation within the design community amounts to a self-reflective reproduction of the design profession.” (Krippendorff 2006, p. 209). Krippendorff’s concept of a science for design aims to establish a science in its own right that encompasses both design practice and design research.

5.2.1 Research through design
Design practice can be a relevant approach for academic knowledge production, however the relationship between research and design is rather complex. Brandt and Binder (2007, p. 2) state that “design practice may involve research and design research practice may involve design”, but research is not design and design is not research. Fallman (2007) points to the tension between design practice and research through the use of the concepts of design-oriented research and research-oriented design. Research-oriented design entails a concern for the development of the product itself. While this approach might provide new knowledge, the primary goal and focus is the final product (Fallman 2009, p. 198). In contrast, design-oriented research emphasizes the overarching aim of generating knowledge by focusing on early prototypes or experiments that may
be unstable, lacking, or having partially faked functionality, but may generate new knowledge. In this approach, the design experiments are means for generating new knowledge (Fallman 2007, p. 197). However, following Brandt and Binder (2007, p. 3), for knowledge to be considered as research knowledge, it must be driven by inquiries that lead to the generation of knowledge that is accessible and arguable among peers. According to Brandt and Binder (2007), knowledge gained from design experiments should meet the following three criteria in order to qualify as research knowledge: (1) The knowledge should have a genealogy that relates to a particular thread of discussion and practices among peers, to ground the knowledge in previous work but also to expand the particular field with new knowledge. (2) The design interventions should challenge and put the design researcher’s assumptions at stake in a situation constructed so that it can “talk back” to the researcher. (3) The knowledge generated should contain an argument that is arguable and contestable by external peers, if it is to qualify as research knowledge (E. Brandt & Binder 2007).

Christopher Frayling (1993) has inspired many researchers with his discussions on research in art and design. Within interaction design research, his ideas have influenced the experimental design research approach—research through design (e.g. Fallman 2009; Ludvigsen 2006; Zimmerman et al. 2007; 2010). Frayling differentiates between three different categories of research in art and design. Research into art and design is research into historical and theoretical perspectives in art and design; research through art and design relates to the material research, action research, and development work that leads to prototypical examples; and last, research for art and design, which is research where the contribution is an artifact, for example a painting or sculpture (Frayling 1993, p. 5). Ludvigsen (2006) builds on Frayling’s (1993) categories of research in art and design with the addition of the concepts of research-on-design, research-through-design, and research-in-design. In the following, I use these concepts to further my experimental research approach presented in this dissertation.

First, the design itself is the focus of research-on-design, both from a historical and sociological stance. The emphasis is on how the object affects and impacts our culture. Second, research-in-design relates to the exploration of the processes of doing design. This approach encompasses developments in design methodology, methods, and techniques. Third, research-through-design is an approach that aims at generating new knowledge through design experiments, inquiries, and interventions. The goal with this approach is to generate knowledge and not to develop “successful” or commercial “off-the-shelf” products. An experiment or prototype that does not work as intended still has the potential to generate knowledge relevant for the research questions. This approach is in line with Fallman’s (2007) concept of design-oriented research where the aim is to generate new knowledge through design experiments and early prototypes. My own experimental design research approach also draws on this particular emphasis.
5.3 A concept-driven design research approach

This dissertation's contribution to the area of interaction design research is a new conceptual understanding of crowd experience that distinguishes crowds from other social gatherings within experience-oriented design. Thus, I categorize this research contribution as conceptual, and my approach somewhat in line with Stolterman and Wiberg's notion of a concept-driven design research approach (2010).

As an approach to interaction design research, concept-driven design research focuses on theoretical developments, concepts, and advancements rather than situated particulars (Stolterman & Wiberg 2010, p. 97). According to Stolterman and Wiberg, theory is “condensed knowledge that on a general level explains properties, mechanics, dependencies, and relationships in a way that constitutes a foundational way of understanding reality as understood within a discipline.” (Stolterman & Wiberg 2010, p. 99). This is in contrast to current empirical-based approaches that primarily take point of departure in context and focus on the particular when doing experimental design research. While empirical approaches find inspirations and restrictions in situations, the concept-driven design research approach finds inspirations and restrictions in earlier theories (Stolterman & Wiberg 2010, p. 102). My research falls into the category of concept-driven design research with its strong conceptual and theoretical dimensions, and focus on theorizing about interactions rather than the design object itself. Although there are differences between empirical-based approaches and concept-driven design research, the latter should be considered as an approach that complements current interaction design research methodology as it is “explorative in nature, aiming at manifesting visionary theoretical ideas in concrete designs.” (Stolterman & Wiberg 2010, p. 97).

Although concepts and theory are fundamental to concept-driven design research, this approach is still designerly and explorative, which is why Stolterman and Wiberg relate to the design as conceptual designs (2010, p. 112). This approach is different from non-designerly approaches, such as critical discourse analysis and empirically grounded hypothesis testing because it is an exploratory investigation with the aim of generating new knowledge and theoretical advancements (Stolterman & Wiberg 2010, p. 102). The concept design should not be judged as the specific object but as an agenda and guidance for forthcoming directions of creative and theoretical explorations. Because concept-driven design research is a strong de-contextualized and theoretical approach, it has the liberty to explore more idealized concept designs. As Stolterman and Wiberg argue, concept design “...strives to illustrate and express specific, radical, and even extreme values.” (Stolterman & Wiberg 2010, p. 105).

In relation to Stolterman and Wiberg's concept-driven design research approach, I want to further address the nature of idealized concepts in design. I find close relations between ideals in design and concept-driven design research because concept-driven design research investigates the “extreme values” and “visionary theoretical ideas” rather than the particular in design. Nelson and Stolterman (2003) argue that design inquiry is an emergent compound of the real, the true, and the ideal. Ideals are about aims, intentions,
that-which-should-be. That is what we strive for in design, but are in their nature unattainable utopias as design is about evoking, creating, and grounding the real and particular (Nelson & Stolterman 2003, p. 45). Nevertheless, design ideals are to be seen as giving directedness towards that-which-should-be, and not the outcome of design.

Both design ideals and concept-driven design research rely on abstract conceptualizations or ideal types. The concept-driven design research approach is grounded in theoretical conceptualizations and design ideals, such as utopian ideals of that-which-should-be. The emphasis on the ideal as relevant to concept-driven design research heightens awareness of the place of ideals in design, and thus the potential of to explore visionary and guiding concepts. In relation to this study, this way of thinking opens the door to new paradigms and conceptions of interactive technology. Concept-driven design research and design ideals can support explorations of what Bødker describes as alternatives (Bødker 2003). The particular designs might not be feasible in context, but they might function as manifestations of intellectual concepts and ideals that explore the boundaries of meaningful interactive technology.

My aim for this study is to establish a conceptual understanding of technology-supported crowd experience. The research approach is not only grounded in crowd theory, but this dissertation also introduces the concept of crowd experiences to advance and further the conceptual understanding of social experiences within experience-oriented design. It is important to view my two design experiments that were created to support crowd experiences—BannerBattle and the crowd app concept—as conceptual designs (see chapter 6) rather than prototypical designs.

5.4 My approach to investigate technology-supported crowd experience

I relate my research approach first and foremost to a research-through-design approach, as a designerly research approach that through design inquiries and concept designs investigates crowd experiences within interaction design. Design inquiries and interventions are at the center of my approach in order to foster dialogical knowledge generation between my design research activities.

My approach aligns with Stolterman and Wiberg’s (2010) concept-driven design research. I draw on sociological crowd theory to introduce crowd experience into the field of experience-oriented design within interaction design. This may seem to diverge from contemporary empirical-grounded interaction design research methodologies, however I agree with Stolterman and Wiberg’s argument that concept-driven design research compliments rather than replaces empirical-grounded methodologies (Stolterman & Wiberg 2010, p. 96). Although I have taken a concept-driven design research approach, many of my research activities have been carried out as ethnographically inspired field studies and user-centered workshops. Two of these studies were organized to gain detailed knowledge about the contexts of crowds at sporting events. While the study outlined in P4, which investigated the design ideal of teenagers’ everyday engagement,
through research activities that challenged the boundaries between empirical-based and concept-driven design research approaches. From this experience, I would argue, in line with Stolterman and Wiberg (2010) that empirical-grounded and concept-driven approaches complement each other, rather than replace or compete with each other in terms of relevance to interaction design research. I would also argue, that the detailed empirical knowledge about the context of crowds at sporting events that I gained from user-centered workshops and ethnographically inspired field studies was, to a large extent, responsible for the success of my approach to a concept-driven design research approach.

In the following chapters I will further emphasize the conceptual and idealized approach I followed in order to make the contribution summarized in this dissertation. Throughout the study my aim has been to deepen understanding of the theory and conception of crowd experience in the field of experience-oriented design. Although, design experiments have been at the center of my research and functioned as valuable assets for knowledge generation, the design artifacts themselves are not the core contribution of my research.
6 Design experiments

As previously argued in this dissertation, crowd experiences have not yet been fully explored within experience-oriented design (see chapter 3 and 4). The design experiments that I carried out aimed to explore different aspects or concepts related to crowd experience. I base this dissertation on three different design experiments: The BannerBattle experiment, the Crowd App Concept Project, and the Gaming the Museum workshop. (1) The series of BannerBattle experiments were created to explore crowd experiences, as an alternative paradigm to the sanitized spectator experiences. The BannerBattle experiments introduced an awareness of how crowd interactions might be supported at sporting events. (2) The Crowd App Concept project was based on experiences and insights generated in the BannerBattle experiments, and on aspects of sociological crowd theory that relate to crowd experiences and behavior. This project had a strong conceptual and theoretical focus, and also aimed to support and stage the behavioral dynamics of imitation and emergence. (3) Gaming the Museum was a two-folded experiment that investigated how the social structure of a class of teenagers might relate to crowd socialites, and how to methodologically inquire into the conceptual qualities of engagement omitting contextual and cultural constraints. Even though the domain of the workshop was a cultural heritage museum and the participants were teenagers (13-14y), the methodological approach of inquiring into concepts of engagement provided valuable knowledge for my further experiments. Thus, in regards to my dissertation, the approach rather than the domain of the museum was the focus of this workshop.

6.1 BannerBattle—initiating explorations of crowd experiences

BannerBattle was a first attempt to explore crowd experience as an alternative to current interactive technology at sporting events. As I have argued in chapter 2, technological systems at sporting events primarily aim at supporting sanitized experiences. Based on conceptual understandings of social and crowd experiences at sporting events, BannerBattle functioned as a first attempt to undertake inquiries into technology-supported crowd experience. The BannerBattle concept should be considered as an exploration of the conceptual boundaries of technology-supported crowd experiences.
Photo 1. One of the two banners displaying the two crowds augmented with team colors (blue and white and red and white), and an equalizer in between, visualizing their sound.

Photo 2. One of the video cameras and directional microphones used for recording the home crowd’s stand.
Design experiments

that go beyond augmenting the sport, supporting spectators’ reflections upon their collective experience, or staging the crowds as judges.

BannerBattle (see also P1, P2, and P3) is an interactive display developed to support active and participative crowd experiences at sporting events. It was developed as part of the iSport project at the Center for Interactive Spaces—an initiative set up to explore the use of interactive technology in three focus areas: elite athletics, recreational athletics, and spectator experiences at sporting events. BannerBattle fitted into the latter of these categories. We deployed BannerBattle at three football matches in the Danish premier league for men with an average of 9.000 spectators attending each event. The overarching aim of BannerBattle was to move the focus of the technology beyond augmenting the sport and to explore the crowd experience by supporting the active and participative crowd behavior in the stands.

BannerBattle consisted of two eight-meter-long advertising-banner displays, two video cameras, two directional microphones, and three computers for analyzing data and processing the graphics for the banner displays (see photo 1, 2). One banner faced the home spectator crowd and the other the visiting spectator crowd. Both banners displayed identical interfaces and content. Each crowd was video and audio recorded. We decided to overlay each spectator crowds’ video feed with their respective team colors. One of the computers analyzed and visualized the audio as an equalizer, separating the two crowd’s video feeds (see photo 2).

At the beginning of a match each crowd would have their video feed instantly displayed on 50% of the display (home crowd on the left and the visiting crowd on the right side of the banner, see photo 1). The display then showed the two crowds’ physical activities (tracked by the video cameras) and their sound level (measured by the microphones) so that everyone could see which crowd was the most vocal and active—it was like a “battle of the crowds”. The more physically active and louder each crowd was the more screen area they would conquer from the opponent crowd. In this way, they could both see and present more of their own crowd on the display while suppressing the opposing crowd’s video feed.

The primary intention of the BannerBattle experiment was to explore technology-supported crowd experience as an alternative to sanitized spectator experiences. First, the intention was to support the experience of the crowd as a united whole. We wanted to emphasize the spectators’ sense of being a part of a united and equal crowd by augmenting the spectator crowds’ video feed with team colors. To further support the crowd experience, the aspect of battling was implemented to strengthen the sense of a power battle being played out between the two crowds. Second, the intention was to acknowledge, support, and emphasize the spectator crowds’ active and participative engagement at the sporting events. Therefore, BannerBattle’s aim was to encourage the crowds to collectively conquer more screen area through the engagement and endeavor of their collective behavior. Third, the aim was to design BannerBattle to be open for

9. www.interactivespaces.net
instrumental appropriation (Petersen et al. 2004, p. 271), so that the crowds had the possibility to adapt and appropriate the interaction with the banner in ways that the spectators would find meaningful. BannerBattle displayed the live video feed of the crowds—but what was shown, performed, or staged on the banners’ video feed was up to the crowd to decide.

I was involved in the complete development process of BannerBattle. From carrying out initial and repetitive field studies at sporting events and on fan bus rides; preparing, organizing, and facilitating co-constructive design workshops with sports fans; developing and deploying the BannerBattle concept; to data collecting and evaluating the experiment.

### 6.2 The Crowd App concept—conceptual exploration of imitation and emergence

The BannerBattle experiments were a first attempt to inquire into technology-supported crowd experiences and also to promote an increased awareness of the need for further exploration and conceptualization of crowd experiences. With foundation in sociological crowd theory and pragmatist philosophy, I found imitation and emergence to be central crowd dynamics that needed to be investigated further (see chapter 4, P2 and P3). With this conceptualization of crowd experiences, I engaged in the Crowd App Concept project to generate and further investigate technology-supported crowd experience through imitation and emergence.

The Crowd App concept has not been described or discussed in the included papers and I will therefore make a more thorough description of the concept here. The Crowd App Concept started as a project specifically aimed at exploring the behavioral dynamics of imitation and emergence for supporting crowd experiences. It is a concept developed in collaboration with the Alexandra Institute as part of the EVINN project that focuses on event-based innovation at sporting events. The Crowd App Concept had a strong conceptual focus on exploring crowd experiences from a theoretical standpoint. A preliminary experimental prototype of the app was developed and installed on a handful of smartphones for demonstration and exploration purposes. We demonstrated and experimented with the app together with fans from the local football team in Aarhus at an away match. We took the smartphones on a fan-bus ride to the match, where we in collaboration with spectators on the bus, at a pre-match bar, and at the sporting event demonstrated and experimented with the concept.

The Crowd App Concept is an app that illuminates different colors on a smartphone display according to simple modes of interaction, such as movements or audio input (see photo 3). Having the app installed on a smartphone makes it possible for crowd participants to collectively assemble mosaics with their smartphones displaying certain colors according to their behavior (movements or audio). The app has four interaction modes that each provide different ways of displaying colors on the phones:

10. www.alexandra.dk
**Movement 1:** The display lights up four different colors according to the orientation of the phone (-90° = red, 0° = blue, +90° = white, 180° = yellow). The intention with this was to provide the spectator crowd with the opportunity to assemble a huge mosaic by displaying different colors on their smartphone screens.

**Movement 2:** The display illuminates a certain color when the phone is being moved which then fades when the phone is still. The faster the acceleration, the brighter the colors. The idea was to make it possible for the spectator crowd to shake or reach their phones in the air to form a collective flash of colors.

**Audio 1:** The display illuminates with bright colors according to the crowds’ auditive rhythms. In this way the crowd’s stamping, clapping, chanting, and singing, etc., would illuminate the display.

**Audio 2:** The display illuminates colors according to the pitch of the audio in the crowd. It is quite similar to Audio 1 however the phone reacts to the pitch of the sounds rather than their rhythm.

The general intention of this concept was to investigate technology-supported crowd experience that could promote a feeling of a we-phenomenon and a capricious potential in the crowd, by augmenting the crowd’s rhythmic imitations and the potential for emergent behavior. The visual coherence of the spectator crowd is significant for the crowd’s feeling of collectivity. Spectators already aim for such coherence by dressing up in team colors and creating huge colorful tifos. The intention with the app was similar—to give the spectator crowd a way to collectively assemble a huge dynamic mosaic consisting of smartphone displays. Each smartphone would act as single pixel in a huge collective

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11. A tifo is a choreography displayed by fans often made of hundreds of flags or colorful objects to form a mosaic, graphical pattern, or image.
display of the spectator crowd. The functionality of the app might at first seem rather simple, however in order to provide the crowd with the possibility to appropriate and use the app in emergent, unforeseen, and alternative ways, we took the open-endedness of the app to the extreme. In the same way as a ball might seem like a simple object, the possibilities are enormous. Our intention was to provide similar open-endedness with the app so that the spectator crowd could explore and be creative with its use, rather than be constrained by hard-defined rules of how to interact with the app.

We demonstrated and evaluated the Crowd App Concept in the context of a football sporting event. We installed the app on the smartphones and took them on a two hour fan-bus ride to an away match. During the bus ride to and from the sporting event, we conducted semi-structured interviews with fans about the concept and they experimented with the functionality on the bus. During the match, we demonstrated and evaluated the concept in the context of the stadium.

The findings from these preliminary experiments and interviews with the fans showed the following results: First, the Crowd App Concept generally functioned well—as a preliminary conceptual design. Especially interaction mode Audio 1 and 2 functioned well as they were able to provide a dynamic visual augmentation of the crowd’s songs and chants at the sporting event. The match was played in daylight, which challenged the visibility of the displays from a distance of more than 5-meters. However, within a couple of meters, the colors on the displays were easy and clear to see and distinguish from each other. We were aware of the visibility issues before the experiments and some of the fans that were interviewed on the bus ride on the way home also highlighted the problem—as one guy said: “It might function well during the winter times as many of the matches are played in the evening, however in the spring and summer time it would be almost useless”. Second, although the Crowd App Concept is a preliminary experiment many of the interviewees expressed excitement about the concept of the app. One young woman, when I asked if she would consider using the app, answered: “Wow that is nice, I would very much like to use this app” and then she called over her friend to show her the app. They talked about how it would be an amazing mosaic of lights if all spectators in the crowd used the app simultaneously. The excitement was most pronounced amongst the younger generation of fans—those aged 13–40 y, while the older generations did not find it that relevant or interesting. As one guy stated, “well this is just a part of the modern football”. He did not find the Crowd App Concept relevant for him as in his understanding it was a product of the modern and professionalized sporting event.

Even though this experiment is preliminary and has a strong conceptual focus, it is still interesting because it is based on conceptual understandings of crowd dynamics—imitation and emergence—that may promote crowd experiences. It is crucial to emphasize the conceptual aspect of the experiment. We carried out the experiment and presentation of the concept at the sporting event with the awareness of the app’s conceptual and preliminary state. In line with Stolterman and Wiberg (2010) the Crowd App Concept was exploratory and visionary with imitation and emergence as the conceptual
foundation for understanding crowd dynamics. It was, and still is, a preliminary research experiment that requires further experiments and evaluations. The initial experiment generated valuable knowledge about the conceptual understanding and potential of technology-supported crowd experience despite the visibility difficulties and the limited demographic attraction. The Crowd App Concept provided an initial guide to how the behavioral dynamics of imitation and emergence can constitute a sense of a we-phenomenon and a capricious potential in the crowd.

6.3 Gaming the museum workshop—an approach for conceptual explorations of engagement

The Gaming the Museum workshop (see P4) was part of the Participatory Cultural Heritage project conducted by the Center for Digital Urban Living at Aarhus University (2009-2012). The workshop took place in an empty exhibition space at Moesgaard Museum, which was a major stakeholder in the project. A school class of 22 teenagers (aged 14-15 y), their 2 teachers, and 5 design researchers participated in the workshop.

I was engaged in the Gaming the Museum workshop for two reasons: to explore the boundaries of what could be considered a crowd and to explore the methodological approach of conceptual inquiries. First, studies of cultural heritage museums are out of the scope of this dissertation, but my engagement in this workshop was to investigate a class of teenagers’ sociality in relation to the crowd dynamics discussed in chapter 4. Until the Gaming the Museum workshop my studies had centered on spectator crowds at sporting events. Such crowds are not institutionalized, formally organized, or governed by societal hierarchy; they are constituted by their imitative and emergent behavior. However, I wanted to investigate if and how potential behavioral dynamics of crowds might exist in a class of teenagers at a workshop, as a critical study of the boundaries of the sociality of crowds. I engaged in the workshop so that I could investigate the social structures that would emerge among the teenagers as they engaged in the workshop activities. Second, I also engaged in the workshop to inquire into conceptual understandings of engagement, which are relevant when exploring engaging crowd experiences. As previously argued (chapter 5), the foundation of this dissertation is based on a concept-driven design research approach (Stolterman & Wiberg 2010). The Gaming the Museum workshop was an attempt to explore the conceptual qualities of engagement while omitting the cultural and contextual aspects of the museum. Engagement was the central concept that was considered throughout the workshop activities and the museum context was only introduced after a strong conceptual focus on engagement had been established. In other words, we carried out a conceptual investigation of engagement and only later related it to the museum context where the experiments took place. As Stolterman and Wiberg (2010) argue, empirical-oriented approaches might not be the best option when developing theoretical and conceptual knowledge. In relation to my dissertation, empirical-oriented approaches proved valuable in the investigation and development of a conceptual understanding of the tension between theoretical concepts and the particular context. Whether the context is a museum, school, public place, or
sporting event is less relevant as the primary focus is on the conceptual explorations rather than the particular context. Therefore, this approach functions as an example of how I inquired into conceptual understandings of crowd experience while retaining the existing cultural and contextual constraints, and perspectives on spectator experience at sporting events.

The aim of the Participatory Cultural Heritage project was to explore and develop new interactive museum exhibition spaces for engaging experiences. In order to investigate the conceptual qualities of engagement, the workshop began by exploring teenagers’ engagement in computer games and online communities. Computer games and online communities were chosen because teenagers’ engagement in these situations generally is strong. It is crucial to emphasize that the aim was not to design museum exhibition spaces as computer games nor online communities, but to facilitate conceptual explorations on engagement in collaboration with the teenagers. The workshop consisted of three main parts and two translation processes. The three main parts were centered on co-constructive and design-oriented activities, while the two translation processes gradually moved the conceptualized knowledge on engagement towards the museum domain at the same time as preserving its conceptual nature (see figure 1).

Figure 1. The workshop was structured as three parts connected by two translations: from computer games and online communities to physical games and from physical games to museum exhibition spaces.

In the first part of the workshop, the teenagers had to discuss the qualities of computer games and online communities that they found especially engaging. In the second part, the teenagers were asked to create a physical version of their computer game or online community with simple props such as cardboard and paper. The physical version had to embody the qualities that the teenagers found especially engaging. This first translation between part 1 and 2 of the workshop served two purposes: to concretize the engaging qualities that they had discussed in the first part of the workshop, and to maintain these qualities in the second part of the workshop. In the third part of the workshop, the teenagers brought their physical computer game or online community into the domain of the museum. To support the second translation we invited the teenagers to tour the museum’s cultural heritage exhibitions for 15-minutes. During this brief visit they could take photos of whatever they found interesting at the museum. We printed the teenagers’ photos and they were used as props for the third part of the workshop. We
did this to ensure that the photos of the museum domain would also be rooted in what
the teenagers found engaging in the exhibition space, and to support the integration
of their own ideas and the museum context. Subsequently, the teenagers had to create
an exhibition space for Moesgaard Museum using their newly captured photos and the
physical mock-ups that they had created during the second part of the workshop. The
aim was to merge the teenagers’ everyday engagement with the locality and physicality
of the cultural heritage museum. The intention, therefore, was to explore the creative
potential of museum exhibitions based on the teenagers’ engagement rather than the
domain of cultural heritage exhibitions.

The museum exhibition spaces that the teenagers developed during the workshop
were all idealized conceptual designs. One group made a car race track at the museum,
another group made a social fighting arena where friends could fight each other with
weapons from different historical periods, a third group made an exhibition space that
had to be explored by jumping on a trampoline. These concepts were manifestations of
abstract conceptualizations of teenagers’ engagements in computer games and online
communities. From a methodological perspective, this approach of taking conceptual
qualities of engagement as the point of departure rather than the context becomes
interesting as a way of exploring more generalized and conceptual aspects of teenagers’
engagement at museums, and as a way to overcome the existing cultural norms and
customs of contexts.

In relation to my dissertation and concern for technology-supported crowd experience,
this approach demonstrates how new understandings can arise if the focus is placed
on the concept rather than the context. From my studies of the social structures that
unfolded during the workshop, I reached the conclusion that the social structures I
had observed in the workshop aligned, to a large degree, with the concept of collective
action that Ludvigsen (2005) presents in his framework, rather than the concept of
crowd behavior. The teenagers collaborated on the workshop activities as they worked
to solve the different tasks. Of course, the teenagers had a very strong social awareness
of their friends and group members, but in ways that related to group rather than crowd
dynamics. This further contributed to the argument that crowds have a distinct sociality
compared to other kinds of groupings and gatherings (see chapter 4).

My involvement in this project consisted of developing and facilitating the workshop with
colleagues with its specific focus on the methodological approach and crowd dynamics.
At the workshop, I joined one group of teenagers and engaged them in discussions. I
also provided assistance and collaborative help with concept development. The aim of
my involvement in this project was to explore a possible approach to design-oriented
conceptual exploration.
This chapter will focus on the conceptual model for social experiences that I have developed from my theoretical and empirical investigations (see figure 2). In this instance a conceptual model is a tool to help us know, understand, or simulate the subject matter represented. Here the aim is to establish an understanding of crowd experiences that encompass the non-rational behavioral dynamics of imitation and emergence, and which can benefit designers when designing technologies that support crowd experiences. The model relates to current understandings of collective experiences within experience-oriented design (see chapter 3), but differs from much of the current research in its focus on crowd experiences that are driven by distinct non-rational behavioral dynamics.

Figure 2. Conceptual model of social experiences within experience-oriented design.
7.1 The conceptual model
The model consists of three circles representing social experience, collective experience, and crowd experience. The cloud shape represents social experience and the two circles within social experience each indicate two distinct types of social experience—collective experience (chapter 3) and crowd experience (chapter 4). Social experiences are experiences that unfold in a social context among individuals. In the model this is visualized as a cloud that is expanded and formed by the five individuals engaged in the social experience. The aim of this visualization is to emphasize that social experiences, regardless of whether they are collective or crowd experiences, are constructed by peoples’ engagement in the situation. The social experience will expand if more people engage in the situation or contract if they withdraw. Social experiences are initiated by events—for example an overall sporting event or smaller events such as one person shouting, chanting, or singing—which initiate shared engagement in the situation. In the model, the event is placed at the general level of social experience to indicate that both collective and crowd experiences might emerge from the same event and furthermore that the social experience might interchangeably shift between the two types of experiences.

The two circles within social experience represent two distinct types of social experience—collective and crowd experience—each have distinct behavioral dynamics and experiential qualities. The collective experience is an experience that emerges among people that collectively reflect and negotiate the meaning of their experience. For instance, an event might occur that initiates discussion among two or more people—they collectively reflect upon and negotiate whether this experience is meaningful for them. The crowd experience is distinct in relation to other social experiences as it is driven by non-rational behavior that spontaneously emerges in the crowd through imitation and emergence. Participants are immersed in the crowd and almost become de-subjectified, so that the crowd has the feel of a united and coherent whole.

Within the circles of collective experience and crowd experience are a set of behavioral dynamics and experiential qualities. The dynamics can be observed in peoples’ behavior, and they are termed dynamics because they stimulate, foster, and constitute the potential for certain experiential qualities. Collective experiences are driven by reflective behavioral dynamics related to recounting, rejecting, storytelling, reciprocating, and confirming, which constitute the experiential quality of “lifted-up” experiences and co-constructed meaning (chapter 3). In crowd experiences the behavioral dynamics of imitation and emergence constitute the experiential qualities of a we-phenomenon and a capricious potential (chapter 4). There might be a continuous interchangeability between the two types of social experience, as crowd experiences exist transiently and momentarily. They may only emerge under certain social circumstances and then might evaporate again.

This model is based on a pragmatist epistemological perspective on experience, where experiences are considered as holistic and phenomenological phenomena that are actively constructed in the relation between an individual and a situation (see chapter
In this model collective experience and crowd experience are drawn as two distinct types of social experience. As I have discussed in chapter 3 the concept of collective experiences is well described and discussed in the literature. Here the focus is on the reflective behaviors of storytelling and recounting (McCarthy & Wright 2004; Wright & McCarthy 2010), reciprocating, rejecting, and confirming (Battarbee 2003; Battarbee & Koskinen 2005; Forlizzi & Battarbee 2004) that potentially can provide lifted-up experiences and co-constructed meaning. The intention is to expand the current understandings of social experiences with the addition of crowd experience as a distinct type of social experience driven by non-rational behavioral dynamics. Crowds can be conceived as emerging entities, which are given life through people’s participation and behaviors that affect the characteristics of the crowd.

Figuratively, the social experience could be thought of as a life net. The social experience—whether it is a collective or crowd experience—is a phenomenon that people actively participate in forming. People are holding on to the life net with their hands, collectively expanding and forming the net. This life net is the social experience; it is formed and expanded by the peoples’ active engagement. People can let go of the life net and thereby withdraw from the social experience, from where they can then observe and maybe later reengage in the social experience.

During a sporting event both collective and crowd experiences can emerge either simultaneously or interchangeably. In the following, I will present and discuss my research findings in relation to how collective and crowd experiences may emerge among spectators at sporting events. I will also further elaborate, nuance, and discuss these results in relation to the conceptual understanding of crowd experience within experience-oriented design.

### 7.2 Collective experiences as lifted-up and co-constructed

Within the model of social experience outlined above the collective experience is represented by the circle with the light-grey background. Collective experiences are constituted by reflective behavior such as rejecting, storytelling, reciprocating, recounting, and confirming the experience that unfolded. Such reflection may promote lifted-up experiences where meaning is co-constructed. People have a collective experience when they gather together and talk and reflect upon events and their experience. This reflective behavior is a significant part of attending sporting events, but as discussed in P1, P2, and P3, collective experiences also emerge before and after events.

From discussions with fans participating in the co-design workshop in the BannerBattle project, I gained knowledge of the reflective behavioral dynamics that emerge before and after sporting events. For example, spectators often communicate with fellow spectators

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12. Rescue equipment used by firefighters that would allow people in buildings to jump to safety.
before the event. This frequently involves SMS text messaging, which they will use to pass on their opinions as well as photos of the outfits they intend to wear. Such staging and storytelling confirms their mutual expectations and anticipation, and helps to build-up collective anticipation and produce a negotiated meaning of the sporting. The fans that participated in the BannerBattle workshop, for example, expressed the importance of their social activities before and after the sporting event. Before home matches the fans would often meet either at a local bar or at a pre-match bar located at the sporting venue. Here they would build up anticipation about the event by discussing the latest news and rumors relating to their team and telling stories about previous experiences and events. The workshop participants considered these pre-match activities a significant part of the spectator experience and in that regard emphasized the unique social experience of attending away matches where they travelled in busses to and from the event. They noted that away matches were especially important for supporting and constructing their social relationships. I attended two fan-bus rides to gain further knowledge about how collective experiences were lifted-up and meaning co-constructed (see P1 and P3). The bus ride is a suitable context for sharing and telling, “war stories” about previous experiences and events. P3 discusses episodes were some experiences or stories seemed to achieve almost mythic, ritual, or cultural status, as they were especially unique and meaningful for the fans. As described in P3 one particular fan always asks the same question when entering the fan bus, or the same group of people asks the same rhetorical question at the beginning of the bus ride. The stories often relate to episodes or events that involve fellow spectators, for example one story related to a guy who missed the bus back from an away match. On the way home the fans often discuss the results of the day, the event, and experiences that they have had.

Of course, these reflective behaviors of storytelling and meaning negotiation also emerge during the actual sporting event. However, during the sporting event, the spectators’ attention is devoted to the match and also to the crowd behavior that may occur. Thus the spectators’ engagement in the reflective behavior of storytelling and meaning negotiation tends to be a more limited and momentary behavior. The context of the bus rides or pre- or after-match bars seems to provide a much better situation for the reflective behavioral dynamics that constitute the experiential qualities of collective experiences. The pre- and after-match activities are in many respects an ongoing process of lifting-up and collectively negotiating the significance of experiences through reflective behavior— together the fans co-construct meaning of their lifted-up experiences. Individual spectators might have had a certain experience and when they share and discuss this experience with other spectators they might reject or reinforce it as a meaningful experience. Experiences are not only constructed as a process of selecting what should be included and excluded in the recounting of the experience (McCarthy & Wright 2004), but also the collective process of negotiating if a particular experience is worth shared attention (Forlizzi & Battarbee 2004). Collective experiences are constructed through negotiation as individuals communicate and narrate their experiences in a social context so that it is shared with others and also has the potential to become a shared frame of reference
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of future experiences. Even though these experiences are holistic felt experiences, the meaning is constructed and negotiated collectively through the continuous reflective behavior of sense making and as “a constant stream of self talk” (Forlizzi & Battarbee 2004, p. 263) such as anticipation, connecting, interpreting, reflecting, appropriating, and recounting (McCarthy & Wright 2004). These are behaviors that relate to how we think and reflect on our self, others, and the situation. In other words the co-constructed meaning of lifted-up experiences are constituted by the reflective behavioral dynamics of spectator experiences.

7.3 Imitation and emergence as dynamics for crowd experience

The other type of social experience in the conceptual model (figure 2 on page 59) is crowd experience. This is shown within the grey circle in the model. Crowd experience is characterized by the non-rational behavior of imitation and emergence (chapter 4). During sporting events the crowds’ behavior goes beyond sharing and the meaning negotiation of experiences. Crowd experiences also involve an affective potential and the experience of loss of subjectivity among the crowd participants—it is about becoming a we-phenomenon and experiencing the capricious potential in the crowd (see chapter 4). When interviewing spectators at sporting events about their experience of participating in these events, they emphasize that one of the most motivating aspects is to experience the “atmosphere”. Further inquiry revealed that for them the atmosphere relates to the feeling of being and taking an active part in something larger than themselves. They gave as examples the times when many spectators participated in the same activities, such as singing the same song, clapping their hands together, or synchronously stamping their feet. Furthermore, the aspect of unforeseen behavior was mentioned as central to the atmosphere, as one spectator revealed when he expressed his excitement about a special memorable episode when unforeseen behavior emerged and supported a unique atmosphere:

“We actually lost the match 0-2. However, there were a lot of spectators attending the match. And in the second half a couple of young guys walked down to the lower terrace [the most dedicated fans normally stay in the upper terrace], and then suddenly people followed, which resulted in us all standing in the lower terrace. It was amazing and people actually did not care about the match. It truly was a special experience.”

Many of the spectators’ accounts of the special atmosphere at sporting events, like the one above, relate to the conceptual understanding of crowd experience that I have established throughout this dissertation, where the non-rational behavioral dynamics of imitation and emergence constitute a sense of a we-phenomenon and a capricious potential (chapter 4).

I have discussed crowd experiences in P2, P3, and chapter 4: In P2 I introduce crowd theory to interaction design, in P3 I further elaborate on this work, while chapter 4 establishes a conceptual understanding of crowd experience as constituted by the
non-rational behavioral dynamics of imitation and emergence. Here I will unfold this understanding of crowd experience within my conceptual model.

7.3.1 A sense of a we-phenomenon through imitation

As argued in chapter 4 imitation is a behavioral dynamic that can constitute a sense of a we-phenomenon among crowd participants. I previously argued that the crowd experience is not a total de-subjectification but rather the experience of participating in the crowd relates to the sense of collective loss of subjectivity, which overwhelms the crowd participants to the extent that feel like a united and equal whole (chapter 4). It is a mode of feeling in which the collectivity implodes into a single coherent unity—a we-phenomenon. At one of the co-design workshops the participants emphasized the sense of equality as a significant experiential quality of crowd experiences at sporting events. This is similar to the notion of equality in crowds discussed by Bakhtin (Bakhtin 1984b) and Canetti (Canetti 1984). During the sporting event, crowd participants gain a unique sense of equality—gender, age, education, and civil and economic status does not matter. One fan participating in the workshops expressed it in this way:

“We are standing together with people that we don’t know or maybe have never met, but when AGF [the team that the workshop participant supports] scores a goal you hug, jump, give high-fives while saying fuck this is great to each other! And this is together with people that you don’t even know, you don’t know their name or what they do [their profession]. This is really really amazing. … Everybody is 100 percent equal there is no difference among people. … The only things that separate you are the color of your jersey [the team the spectators support].”

As discussed in P3, BannerBattle was created to support this sense of a we-phenomenon constituted by crowd participants’ imitative behaviors such as their visual self-representation and their vocalisations and rhythmic actions. Supporting the crowd’s visual cohesion through imitation was a significant feature of BannerBattle. It provided the spectators with a live video feed of them that staged their crowd internally and externally. Not only was the crowds’ cohesion visible to themselves, internally, but also externally to the opponent crowd. The team colors that overlaid the video feed were used to enhance the sense of coherence and unitedness—it was the crowd as a united whole that was in focus. One of the fans from the co-design workshop, who was interviewed at the sporting event during the first experiment, said—“It is greater than I expected it to be, even though it can be quite hard to see yourself on the banner from the back of the stand..., but I think that having the blue and white colors is quite cool [the club colors that augmented the video feed]”. It was not only the visual imitation of the spectators that was shown on the banner, the crowd’s imitative rhythmic vocalizations and actions were also revealed through the use of an equalizer, the more coherent and unified the rhythmic imitations, the more clearly the visual representation could be seen on the banner (photo 4).
The crowds’ imitative behavior was also promoted by the two spectator crowds’ battle over dominance at the sporting event, which BannerBattle supported. But, several visiting spectators found the battle a bit unfair as the visiting crowd almost always would be a minority and therefore would find it harder to conquer the majority of the banner. One visiting spectator expressed his concern in this way: “I think we were quite loud and it [the majority of the screen real estate] did not come on our side of the banner... you should be sure that the battle is even to make it fair”. This was a situation that we discussed during the development of the concept, but nevertheless during the co-design workshop with the fans they emphasized that being a minority, at away matches, strengthened their sense of being a united crowd. The fans explained that being an underdog at an event is highly engaging as they are forced to stick together and imitate each other’s behaviors such as singing, chanting, shouting, jumping, and clapping. The power battle between the two spectator crowds is a highly motivating factor for staging crowd behavior such as imitation, which Canetti (1984, p. 23) also notes when he argues that power battles and attacks from the “outside” of the crowds strengthen the crowd and draw people together. The way the power battle can engage the two crowds was further apparent during the first experiment of BannerBattle. Two home spectators who were interviewed noted that the unequal battle between the home and the visiting crowds, and suggested that we should compensate the away crowd with some form of preferential treatment. They furthermore stated their excitement about the next home match, as there were rumors that there would be a couple of thousands visiting spectators, which would be more than usual. This is interesting, as one would imagine that the less powerful an opposing crowd, the better. However from an experiential perspective the battle over power and dominance between the two crowds at sporting events seems to
be an essential driver for crowd behavior and experience. BannerBattle augments the rivalry between the two crowds with its visualization of the dominance of one team’s supporters. The augmentation of the crowd behavior emphasizes and fertilizes cohesion in the crowd through initiating imitative behavior.

The Crowd App Concept was a further exploration of how to encourage imitation as a behavioral dynamic in order to promote a we-phenomenon. While the spectator crowds in BannerBattle became a single entity through the use of the teams’ colors to shade the images of spectator crowds on the banner, the Crowd App Concept required a higher degree of spectator participation in order to provide cohesion in the crowd. The crowd participants had to actively decide and use their smartphones to stage their imitative behavior. During our preliminary design experiment we found that two interaction modes designed to augment the crowd’s sound (Audio 1 and Audio 2, see chapter 6) seemed to be especially successful at creating a sense of cohesion in the stands. Audio 1 provided a visual interpretation of the crowd’s rhythmic imitations and Audio 2 the pitch of the crowd’s audio. Photo 5 illustrates Audio 1 where the crowd participants are chanting and their smartphone displays illuminate in rhythm with their chants—the higher the volume the brighter the color on the smartphone display. The preliminary experiment provided a good indication as to how crowd participants could create a collective dynamic augmentation of their auditory imitations, such as singing, chanting, stamping, and clapping.

The interaction mode “Movement 2” aimed to provide the same dynamic augmentation of crowd imitations, but in this the smartphone displays illuminated when moved. The intention was to explore the potential for creating visual translations of the participants’ movements such as raising or “pumping” their smartphones up in the air or jumping
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and holding them above their heads and then seeing the patterns created by the crowd as a whole. This experiment showed that it is challenging to display the synchronous movement of smartphones in a crowd, as even a slight asynchronous movement spoils the visual coherence. However, Canetti’s (1984, p. 31) argument that minor variations in the crowd’s rhythmic imitations have the potential to enhance phenomenological awareness and collective excitement might suggest that the variation and asynchrony of movement could actually enhance the crowd’s sense of cohesion. When asked about the experience and the conceptual designs, the crowd participants generally expressed their excitement about the concept and acknowledged the potential of staging their collectivity. However, it was mostly younger people who found the concept interesting and they were especially keen to see the technology used during the winter season when it would be dark in the stands in the early evening.

Both experiments were designed to support imitative crowd behavior and so create a sense of a we-phenomenon. BannerBattle promoted the sense of a we-phenomenon among the crowd participants by augmenting the imitative and coherent crowd as a whole rather than its individuals. Providing the color filter on the video feed supported the cohesion of the crowd as stated above by one of the spectators—it is the color of the jersey that makes them equal. Furthermore, the battle among the two spectator crowds supported the crowd’s sense of being a coherent and united whole. In particular, the smaller visiting crowd felt it was important to gather together in order to battle the home crowd. They needed to behave coherently by imitating each other’s behavior to strike back at the home crowd—only collective imitations gave them the opportunity to gain screen real estate. Even though the battle among the two spectator crowds might seem unfair, the goal was not to provide a way to objectively measure their crowd activities, but instead to motivate imitative behavior in order to support a sense of a we-phenomenon. In the Crowd App Concept the intention was to stage the crowd as a united whole through smartphone visualizations of rhythmic imitative behavior, such as singing, chanting, clapping, and stamping. This kind of imitative behavior could be seen as a self-representational performance where the crowd emphasizes its sense of a we-phenomenon by collectivity, equality, and unity being enacted through their visual coherence. As Bakhtin (1984b, p. 7) argues, the crowd itself becomes its own spectacle. Both BannerBattle and the Crowd App Concept were designed with this in mind, as they provided a means for the crowds to stage their imitative behavior in order to promote a sense of a we-phenomenon.

7.3.2 The capricious potential constituted by emergence

Besides the behavioral dynamic of imitation that constitutes a sense of a we-phenomenon, emergence is also a central behavioral dynamic in crowd experience, as it constitutes the experiential quality of a capricious potential. In chapter 4 I established the understanding of a capricious potential driven by crowds’ emergent behavior such as their spontaneous creativity and unfinalized and unpredictable potential. In P1, P2, and P3 I discuss spectator crowds’ spontaneous creativity as the emergent behavior of the crowd.
Photo 6. Visiting spectator crowd making a “surprise attack” on the home crowd to momentarily gain the majority of the banner.
Here, I will dig further into the conceptual model of crowd experience by focusing on how emergence in the crowd constitutes an experiential capricious potential in the sense of unfinalizability, unpredictability, and spontaneous creativity.

In the BannerBattle experiments we experienced an episode where the visiting spectator crowd's behavior emerged in an unpredictable and creative way. As mentioned in a previous section, the battle between the two spectator crowds was rather uneven, however the visiting crowd creatively appropriated the banner in an unforeseen and emergent way. In the first experiment of BannerBattle the visiting crowd soon realized that they would have trouble beating the home crowd on the banner. Nevertheless, on several occasions we observed the visiting crowd carried out “surprise attacks” against the home crowd and managed to gain more screen real estate. One of the episodes is illustrated in photo 6. In the first photo the visiting crowd is rather passive then suddenly one guy shouts “Come on guys!” and then people gather together chanting, singing, and dancing. This behavior results in a momentary dominance of the banner. The visiting crowd gets the larger portion of the banner. However, this dominance only lasts for a few minutes before the larger home crowd initiates its collective behavior, and then the visiting crowd gets pushed back, as seen in the last photo.

After the match we interviewed a visiting spectator about the episodes and he explained that they waited until the home crowd paused and got less intense in their chanting, singing, and dancing and then they collectively started to battle the home crowd. The spectator said “When they [the home crowd] are 20 times more than us, it is hard to compete (...) but we waited until they got quieter, and then we started”. This explanation aligned with our observations. This way of engaging with BannerBattle was not something we thought of when designing it, but we did aim at providing an open-ended and unfinalized potential so that it was up to the spectators themselves to appropriate the banner in ways that they would find meaningful. This case illustrates how new types of behavior might emerge and become subject to imitation in the crowd. BannerBattle provided a potential for the spectator crowds’ to engage with the banner and each other in new and unpredictable ways that were not planned or thought of before—they just emerged.

With the Crowd App Concept we further aimed to support the crowd’s emergent behavior, which we had experienced in the BannerBattle experiments. The hope was to deepen our understanding of how technology could support a capricious potential. The crowd participants were provided with technology that would give them greater potential to appropriate, modify, and engage in their own emergent ways. The open-endedness of the app was taken to an extreme by providing the most basic and simple functionality that required engagement from the crowd participants in order to become meaningful. In isolation the app would make less sense, but with the crowd’s active engagement and appropriation it provided the potential for exploration. In fact, in this instance the technology provided to the crowd participants can be considered analogous to the flags that, at times, are handed out before matches. The flags in themselves do not provide any cohesion; it is the crowd’s appropriation of the flags that constitutes the creative
and capricious potential. This is seen when crowd participants hold up flags to create a cohesive mosaic consisting of hundreds of flags or when they collectively whirl their scarfs around above their heads. Spectator crowds appropriate a variety of different props in creative and capricious manners to stage their collectivity. The Crowd App Concept aimed to provide the same creative potential for appropriation with smartphone displays. The four interaction modes are rather basic as they are essentially visual representations of physical and audio events. How this function is appropriated and interacted with is open for the crowd participants to explore. Although the Crowd App Concept has only undergone preliminary testing at one sporting event, the spectators’ reaction to the general concept was positive and they could see the potential of the technology to support the crowds’ capricious potential.

Crowds have a capricious potential that can spontaneously emerge. Whereas classical crowd theory tends to be rather normative and critical of the spontaneous and emergent dynamic of crowds, my view is that the emergent dynamic can be a creative facilitator for a capricious potential. In the research and experiments that underpin my thesis this potential manifests itself in the making up of songs for a special event to the more spontaneous behavior of appropriating BannerBattle in ways that we did not foresee. Participating in a crowd might give the feeling that there are endless possibilities for actions that are unpredictable, unfinalized, and spontaneous—a capricious potential that might emerge.

Imitation and emergence are behavioral dynamics of crowd experiences. It is not that they both have to be present in order to for a crowd experience to occur. The behavioral dynamic of imitation is a significant dynamic of crowds; emergence does not have the same significant status of constituting a crowd. However, from an experiential perspective the behavioral dynamic of emergence constitutes the significant quality of a capricious potential that might be enhanced and promoted by the crowd’s extreme sociality. Imitation and emergence should be thought of as dynamics that facilitate two different and still highly related experiential qualities of crowd experiences, namely the sense of being a part of a we-phenomenon and a capricious potential. Similar to how some collective experiences become almost mythical, ritual, or even cultural, crowd behavior also has this potential to become a tradition, ritual, or something to be inherited in coming sporting events. As I have argued both from a pragmatist perspective and a perspective of crowd theory, crowd experiences are participative phenomena and that therefore function as an alternative to sanitized spectator experiences at sporting events, without compromising safety or commercial interests. I therefore, suggest that when designing interactive technology for crowd experiences it is the behavioral dynamics of imitation and emergence that should be addressed, as they are central facilitators of the unique crowd experience.

7.4 Reflections on the conceptual model
Returning to the conceptual model, the aim is to provide a conceptual understanding of crowd experience as a unique type of social experience within experience-oriented
Designing for technology-supported crowd experience

It is an iconic representation of the very complex situation in which social experiences unfold. I describe the model as iconic to emphasize that it is a reduction of a highly holistic, dynamic, and complex phenomenon. Certain aspects, characteristics, nuances, and relations of social experiences are represented in the model, and the aim is that the experience-oriented design community will embrace this conceptual understanding of crowd experience.

It is crucial to understand that the model conceptualizes two different types of social experiences that both interchangeably and continuously may unfold during sporting events. Crowd experiences are momentary phenomena, that relate to the dynamic behavior of the crowd rather than a permanent state or the numbers of people forming a crowd and may therefore spontaneously emerge. The BannerBattle experiment supported this kind of experience, as we observed how the attention of the crowd participant’s shifting focus between the sport and crowd activities. During the 90 minutes match there are normally periods when the sporting action is less intense, in these periods the spectator crowds tend to engage in crowd behavior, such as singing, chanting, jumping, dancing, and so on. When the sporting action becomes more intense—when the ball gets near one of the goals or the referee makes a judgment—the spectator crowds’ reengage in the sport. This continuous shifting of attention between the sport and the crowd behavior was also seen in our experiments. We observed several episodes when the two spectator crowds where battling each other on the banner and then suddenly the action on the pitch became interesting and the spectators immediately stopped the interaction with the banner. These shifts of attention occurred repeatedly during the matches. Just one "spark of passion" from a spectator in the crowd could initiate the battle. This example emphasizes how crowd experiences are momentary and emerging phenomena.

Collective experiences have been explored by focusing on individuals’ reflective behavior that provides potential for lifted-up experiences and co-constructed meaning (Forlizzi & Battarbee 2004; McCarthy & Wright 2004; Wright & McCarthy 2010). However, crowd experiences take their impetus from the crowd rather than the individual. My conceptual model functions as a lens that focuses on crowd experiences as social experiences in which the crowd is united as a whole. I am not arguing that experiences are not personal, but merely that individuals are immersed in crowd experiences that provide a feel of de-subjectification, and therefore the potential arises to address and stage the experience of being a part of the united crowd as something that goes beyond the personal experience.

As my conceptual model relates to the field of experience-oriented design it might seem peculiar that technology is absent from the model. However, this is deliberate as the underlying epistemological perspective on social experiences is that experiences are actively constructed in the relation between people engaged in a particular situation, where the technology might not even be the focal point of interaction. Interactive technology might promote and support a certain experiential potential. As argued by Krogh and Petersen (2008) when people are co-located interacting with technology, relations might emerge between people interacting that are not mediated by the technology.
Furthermore this conceptual model does not provide designers with a guide or manual of how to design interactive technology for crowd experiences. This model provides a conceptual understanding of crowd experiences that introduces a vocabulary to experience-oriented design that enables designers to have an awareness of and language for a crowds’ distinct sociality when designing interactive technology for crowd experience.
8 Discussion

In this chapter I will further discuss the scope of my contribution in relation to interaction design. Firstly, as this dissertation concerns crowds, it is relevant to discuss what constitutes the scope of crowds in my work in relation to interaction design. Secondly, given that crowds are a distinct sociality how does crowd experience relate to the current pragmatist perspective within experience-oriented design? Lastly, how can crowd experiences be a meaningful alternative to contemporary sanitized spectator experiences at sporting events?

8.1 Crowds as a new sociality in interaction design

Are three people a crowd? I admit that it is a rather rhetorical and polar question and the answer is in itself not that relevant to my discussion. However, the purpose of raising the question is to introduce the question of “what is a crowd”? The answer to this question is relevant to this dissertation as it has the potential to influence how crowds are conceived in the field of interaction design. In recent years there have been calls for the HCI community to run more studies that address the crowd phenomenon (e.g. B. Brown et al. 2009). At the time of writing, the response to this call includes a study of a crowd in a football bar (Reeves et al. 2010), and in the interaction design field there are examples of technologies that have been developed to address the collectivity of crowds (e.g. Barkhuus & Jørgensen 2008; Sheridan et al. 2011). Although these contributions concern crowds, there still seems to be a lack of conceptual understanding of what a crowd is. From my perspective, for the researchers in the field of interaction design to gain a deeper understanding of the crowd phenomenon, there first needs to be a conceptual clarification of the scope of crowds as a new and distinct sociality in interaction design.

The conceptual understanding of crowd experience that I have established in this dissertation is primarily grounded in an understanding of crowds as a distinct sociality that are constituted by physical proximity and the behavioral dynamics of imitation and emergence (see chapter 4). However, a more diverse conceptual landscape of what constitutes a crowd is emerging in light of new technologies. Phenomena such as mobs, gangs, audiences, spectators, visitors, groups, and “the public” relate to the phenomenon of crowds in that they all in some way refer to a kind of a collective: Mobs are often thought of as an assembly of people who are out to cause trouble or have a violent aim;
gangs are often viewed as organized groups involved in criminal acts; audiences are the people who watch a performance in a theatre, cinema, or at a concert; people visiting museum exhibitions are visitors; while spectators are those people who attend sporting events. Recently, new phenomena have emerged such as flash mobs that are staged choreographed performances in public places. Smart mobs, social networks societies, multitudes, and viral networks are some of the terms that have been used to describe and characterize the new phenomena of connected and distributed social networks (Mazzarella 2010, p. 697). It is in light of these new emerging socialites that it becomes relevant to discuss the scope of crowds that this dissertation concerns.

This dissertation relates to crowds that are constituted by the dynamics of imitative and emergent behaviors and where the crowd participants are co-located (Borch 2009a; Canetti 1984). Of course, there are other types of crowds that are not primarily driven by these dynamics such as crowds that are orchestrated and given direction by a leader. In world history there have been multiple examples of leaders (both political and religious) who have “hypnotized” crowds with their propaganda (Borch 2012, p. 105). The scope of crowds that my contribution relates to is the emergent and autonomous crowd without a leader. Rather than being something that is dictated or instructed by a crowd leader the behavior of the spectator crowds at sporting events emerge from within the crowd. Spectator crowds often have a capo13 that is a formally chosen “leader”. The capo’s role is to orchestrate the crowd's behavior. However, what I experienced during the field studies, workshop, and in interviews with fans at sporting events is that the capo mostly “listens” to the behaviors that emerge from the crowd and then suggests these behaviors to the rest of the crowd. The capo is a person within the crowd with a sensitivity towards the imitative behavior that emerges rather than being a leader who dictates and decides the behavior of the crowd. Thus, the crowds that are the subject of this dissertation could be considered as autonomous in their imitative and emergent behaviors since these behaviors originate from within the crowd as an equal whole, rather than a specific leader.

The empirical investigation of this dissertation is based on spectator crowds at sporting events; the contribution therefore primarily concerns spectator crowds, which in some regards have certain unique aspects. The spectator crowd’s sense of a we-phenomenon and a capricious potential is emphasized and staged by the power battle between the two spectator crowds at a sporting event, such as a football match. These battles between the crowds strengthen the two crowds’ senses of cohesion, equality, and unity (chapter 6 and 7). Canetti (1984, p. 27) characterizes the spectator crowd as a “ring” where the crowd is isolated from the outside world and the crowds within the stadium consider each other as enemies. This kind of power battle between crowds is often seen at sporting events where the two crowds are located at opposite ends of a closed stadium or in crowds with a political agenda. Crowds at festivals or concerts tend not to exhibit these competitive behaviors as their collective engagement is generally directed towards

13. A capo is a person who directs the spectator crowd in unified behavior, often by encouraging specific kinds of singing, chanting, or dancing in the stands.
a shared passion that is satisfied by the event. However, this does not mean that festival and concert crowds are fundamentally different from the sporting spectator crowd. Crowd experiences that unfold at concerts and festivals are also driven by the behavioral dynamics of imitation and emergence that constitute a sense of a we-phenomenon and a capricious potential. To return to the example from the introduction (chapter 1) about the lead singer who directed his microphone at the audience who then all began to sing: The crowd’s singing does not sound good or aesthetically beautiful, but the imitation of the other’s behavior establishes a sense of being a part of a we-phenomenon, the singing and collective dancing are capriciously created among the crowd participants. Like at a sporting event—the spectators take an active part in the festival or concert by imitating each other. Even though, the motivators are different for the sporting and festival crowds, the behavioral dynamics of imitation and emergence are the same, as is the phenomenon of a mass of bodies in close proximity. And it is crowds with these characteristics that form the focus of this dissertation.

So, to return to the opening question—are three people a crowd? For the purposes of this discussion the answer is “no”. I hope that it is clear from the discussion above that it is not necessarily the number of co-located people that defines a crowd, but the sociality of the collectivity. Or, as argued by Simmel (1950, p. 115), it is not the sociological quantity but the quality that constitutes a crowd. Thus, this dissertation is not about the collectivity of the hundreds of people walking down the main street on a Saturday afternoon, it is about their behaviors. Hence, the mass of people walking down the street has the potential to become a crowd if the people start to imitate each other’s behavior. The conceptual scope of this dissertation concerns the situations that establish the unique sense of a we-phenomenon and a capricious potential, that together provide the foundation for crowd experiences.

As I have previously mentioned (see chapter 1, 2, 3, and 4), technology-supported crowds are becoming a larger part of people’s everyday and festive lives. People are increasingly interacting with technology when participating in political rallies, concerts, festivals, sporting events, and in public places. But to date, interaction design has been primarily concerned with “ordered” social interactions à la Goffman (1963, p. 4) (see also chapter 4). Thus, there is a need for a conceptual understanding of how crowds as non-rational entities differ from the types of collectivities that the field of interaction design has concentrated on so far. In my perspective, considering crowds as a distinct sociality constituted by imitation and emergence provides a further and nuanced understanding of social interactions to interaction design. Interaction designers may benefit from considering crowds as crowds and not as a social gathering of people. This change in perspective will potentially create a new way of thinking about crowds in interaction design, which might be the first step towards designing new types of interactive technology for crowds.
Chapter 8

8.2 Crowd experience beyond current pragmatic experience-oriented design

As I discussed in chapter 7, crowd experiences are a distinct type of social experience. Such experiences go beyond the current understanding of collective experiences within experience-oriented design that considers such experiences to be driven by reflective behavior. When designing for crowd experiences, experience-oriented design faces the challenge of how to understand and approach crowds as a distinct sociality driven by non-rational behavior, which diverges from other types of social gatherings and groups. I therefore find it necessary to further nuance the discussion on crowds by introducing Bakhtin’s (1984b) thoughts on carnivalesque crowds, which contribute to a new conceptual understanding of crowds within experience-oriented design that goes beyond the individual and reflective experience.

The current theoretical foundation of experience-oriented design centers around a pragmatist perspective on experiences. This has primarily its theoretical starting point in Dewey’s pragmatic philosophy on experience (e.g. Dewey 1929; 1980; 1997). A holistic and phenomenological understanding of experience drives this perspective. Individuals actively construct their experiences in socio-cultural contexts rather than passively consume experiences that exist a priori in the world. McCarthy & Wright (2004) argue that people create meaning of their experiences through sense-making processes, and Forlizzi & Battarbee (2004, p. 263) explore social experiences as a “constant stream of self-talk” where meanings are collectively negotiated (see also chapter 3 and 7). Most of the attention, within experience-oriented design, has been devoted to an exploration of how interactions with technology may support aesthetic meaningful experiences where people connect and reflect on experiences in relation to their everyday life.

However, I argue that crowd experiences go beyond reflective meaning negotiation and sense making. Crowd experiences are immediate, driven by the non-rational behavioral dynamics of imitation and emergence. Crowd participants imitate each others’ behavior without conscious reasoning—at the sporting event spectators initiate their cheering and jumping, not necessarily because of activities on the pitch, but because their fellow spectators do it. Within the crowd new ways of behaving spontaneously emerge, not because they are motivated by an end goal or defined intention, but because the distinct and dense sociality of the crowd facilitates a non-rational spontaneity. Crowd experiences are about the sense of a we-phenomenon, where people feel equal and a part of a united whole, and it is about the capricious potential in the crowd that supports the feeling of spontaneity and unfinalizability. The pragmatist perspectives within current experience-oriented design have not yet considered these aspects and therefore do not readily support a contemporary understanding of technology-supported crowd experiences. Dewey’s pragmatist philosophy primarily concerns the individual’s relation to education, democracy, and experience (Dewey 1929; 1980; 1997). The unity of the crowd and its spontaneous and non-rational behavior is not Dewey’s main interest. Instead, when it comes to experience Dewey seems to have a greater interest in the individual’s activities that are a “means to a consciously entertained consequence.” (Dewey 1980,
p. 65). His focus is on activities that promote democracy, education, and experience, rather than non-rational crowd behavior.

Thus, in this dissertation I have turned to Bakhtin's (1984b) pragmatist account of the grotesque carnivalesque experience to establish the link between sociological crowd theory and the pragmatist perspective currently prevalent in experience-oriented design. Dewey, as well as Bakhtin, are both pragmatists and thus share the same epistemology ground. However, in contrast to Dewey, Bakhtin has a special interest in the grotesque crowd found at the carnival. Bakhtin (1984b), considers the grotesque crowd as a bodily mass driven by their lower bodily strata (feasting, sex, and defecating). During the carnival event, the society is turned inside out and upside-down, which creates temporary liberation from the established order. The power establishments of society are challenged and the society is temporarily revived. In other words, Bakhtin emphasizes that the crowd is driven by primary needs and the desire to destruct the official society, which contrasts with Dewey's perspective. In Bakhtin's work, he provides rich accounts of the experience of being an equal, united, and unified body of the crowd. Bakhtin's particular interest seems to be in how crowd participants feel like an “indissoluble part of the collectivity, a member of the people's mass body” (Bakhtin 1984b, p. 255). I am aware that Bakhtin's philosophical accounts have been explored within experience-oriented design, however this tends to be in relation to dialogicality (see e.g. McCarthy & Wright 2004; Wright & McCarthy 2010). Bakhtin's account of the grotesque emergent carnivalesque experience (Bakhtin 1984b) has so far eluded the attention of research within experience-oriented design. Consideration of Bakhtin's theoretical accounts on the grotesque crowd provides a deeper understanding of the rich participative social experiences within experience-oriented design. Designing for crowd experiences might require experience-oriented design to go beyond designing for a means to an end, and instead explore crowd experiences as non-rational and illogical, a situation where what seems like noise can suddenly become the voice of the crowd.

One of my arguments throughout this dissertation is that current perspectives within experience-oriented design that are based on Dewey's pragmatism have established a valuable theoretical foundation for developing understandings of how people experience interactive technologies, both individually and in social groups, through reflective behavior. As argued in chapter 7 reflective behavior is also a significant part of the spectator experience at sporting events and should not be discarded as less valuable. However, the potential exists to go beyond Dewey's pragmatist understanding of experiences, and to conceive crowd experiences as driven by the non-rational behavior of imitation and emergence, rather than reflective behavior. What I hopefully have made clear is that I fully acknowledge the current theoretical foundation of pragmatism within experience-oriented design (see chapter 3). However, what I suggest is that my conceptual understanding of crowd experiences raises awareness of social experiences, which encompass a crowds’ distinct sociality. In particular, I point to imitation and emergence as two non-rational behavioral dynamics that may promote crowd experience. Thus, my contribution should be considered as a conceptual understanding that builds upon,
compliments, and furthers the current pragmatist endeavors in experience-oriented design. This understanding is itself underpinned by a conceptual understanding of crowd experience, which goes beyond pragmatist conceptions that primarily draw on Dewey. I believe that the non-rational and collective aspects of crowd experiences will provide designers with an awareness, language, and vocabulary that will endow a sensitivity towards technology-supported crowd experience within experience-oriented design.

8.3 Crowd experience beyond sanitization

Throughout this dissertation, I have established an understanding of crowd experiences at sporting events as highly participative: spectators are actively involved in imitative and emergent behavior. This perspective on crowd experience, contrasts with the sanitized view of sporting events that I discussed in chapter 2. In this view sporting events are managed by rationalistic ideals of convenience, organization, safety, and consumerist behavior. Most technological systems at sporting events inherit the same sanitized ideals, and provide individual spectators with additional information about the sport on large displays or on their smartphones. The design of interactive technology for crowd experiences, remains unexplored. Technology-supported crowd experiences should be considered as a meaningful alternative to the technologies at today’s sporting events by actively involve and engage spectators. This sanitization of contemporary sporting events has become the subject of critical public debate as exemplified by this correspondent for *Foul*—a football magazine—who complained:

Their [associates with the English football Association] Utopia is a spotless concrete bowl lined with thousands of little blue plastic seats, lots of clean toilets, a restaurant, a sports complex, piped muzak, and 22 clean-cut, goal-hungry young zombies playing the game in a spirit of friendship and sportsmanship on a plastigrass pitch. They want matches which end in 7–7 draws, watched by packed crowds of middle class parents who have each brought their 2.4 children who cheer enthusiastically every goal, applaud every exhibition of skill from the opposition and who go home afterwards in their family saloons, all agreeing that they have been thoroughly entertained. Bollocks to their visions! It is on those cold forbidding terraces that you find the central nervous system of football from which adrenalin rises and the lifeblood flows. (Redhead 1986, p. 49)

This kind of perspective on the contemporary sanitized sporting event runs the risk of romanticizing and praising the old un-sanitized sporting event. However, the quote emphasizes the essence of the criticism of the sanitization of sporting events during the last half-century. A bourgeois focus and a professionalization of the entertainment “product” have been prioritized over the core spectator experience—the experience of being a part of a crowd. As argued in chapter 2, the modernization and professionalization of sporting events have moved such events into the realm of the entertainment industry. This, in turn, means that spectators are considered as consumers rather than active contributors to the sporting events. Of course, sport is a huge industry and it is
important to provide controlled, well-organized, and safe events to make this entertainment attractive. This does, however, lead to a paradox for modern sports clubs as they are torn between putting on a modernized and professionalized sporting event on one hand, and having actively engaged spectator crowds ecstatically celebrating, chanting, singing, and supporting the teams on the other. The latter being important as it creates the unique atmosphere at the sporting event. It is this atmosphere that encourages the teams to perform better, provides better experiences for the attending spectators, and attracts even more spectators to see the live event than watch the match at home.

It is important to emphasize that the discussion about the sanitization of sport is relevant for interaction design in that it is also inherent in the technological systems that are implemented at sporting events today. The technologies that are implemented at most stadiums are focused on producing finalized information that is delivered to the spectators in a convenient and passive way on large displays or on smartphones (see chapter 2). A huge part of attending the sporting event is of course to engage in the sports, statistics, and additional information about the sport. But, as I experienced with the BannerBattle experiments, the spectators’ focus continuously shifts between the sport and the crowd behavior. Also as Bakhtin argues, in the crowd each member is an active participant of the event “they are the hosts and are only hosts, for there are no guests, no spectators, only participants.” (1984b, p. 249). This fits with the turn in interaction design, discussed in chapter 2, towards a greater consideration of collective experiences, participation, performativity, and engagement of people in public and semi-public places. But, even though the field of interaction design acknowledges the importance of the active engagement of audiences, spectators, and museum visitors, when it comes to crowds at sporting events the interactive technologies that are designed inherit the sanitized perspective. What I am arguing here is that there exists an alternative perspective to the sanitized spectator experience, and this alternative perspective is grounded in my conceptual understanding of crowd experience. I am not advocating for uncontrolled, unorganized, and unsafe events and I want to emphasize the considerations for ethics when designing interactive technology for crowds. What crowd experiences offer is an alternative perspective on how we can design interactive technology for sporting events. This is a perspective that supports the unique experience of being a part of a we-phenomenon and the capricious potential of an experience that is not finalized and produced for the crowd to consume, but instead allows new behaviors to emerge spontaneously and be imitated in the stands. This was the case for BannerBattle and the Crowd App Concept. BannerBattle provided an alternative to the existing technology by supporting collectivity and the crowd’s emergent behavior without compromising safety, organization, or control of the event. And the Crowd App Concept supported the crowd’s active and creative participation in the stands. Designing interactive technology for crowd experiences should be considered as a meaningful alternative that goes beyond sanitization, so that spectators can have the unique experience of being a part of a we-phenomenon and the capricious potential of the crowd, while still having the benefits of the contemporary professionalized, and modernized sporting event.
9 Conclusion

This dissertation summarizes my four years of research, the results of which are presented in the four included papers and this dissertation overview. The underlying question I have addressed is: How can we conceptually understand and design interactive technology for crowd experiences? This dissertation provides a conceptual understanding and model of crowd experiences to experience-oriented design as an answer to my research question. In order to explore this question I took a concept-driven design research approach that required me to interchangeably and continuously engage in theoretical, empirical, and experimental design activities. The design experiments provided knowledge for my academic inquiries, and together they inform my overarching research program on designing interactive technology for crowd experiences. Some of my research endeavors may seem preliminary since they were designed to help me explore the boundaries of my research program. Their purpose was not to be prototypes per se, but to inform my converging research process, which included periods of both inspiration and distillation.

The included papers stand as contributions in themselves, each with their own arguments, theoretical perspectives, concepts, and results. But I have also referred to these papers in the overview, to crystallize a specific view or as a building block when developing a particular argument. The contribution made by the papers is two fold: the first three papers—P1, P2, and P3—provide three furthering perspectives on crowd experiences among spectators at sporting events, while P4 presents a methodological approach to inquiry into the conceptual understanding of engagement.

The main contribution of this dissertation is a conceptual understanding of crowd experiences within experience-oriented design. I have aimed to crystalize my ideas in a conceptual model that will provide interaction designers with an awareness and language of, technology-supported crowd experience. By drawing on sociological crowd theory, I have established an understanding of crowds as a distinct sociality different from other types of social gatherings and groups. Crowds are constituted by their non-rational behavioral dynamics of imitation and emergence. I have pointed to imitation and emergence as two central crowd dynamics as they provide and induce certain unique experiential qualities within the crowd. By establishing a theoretical link between sociological crowd theory—concerning crowd behavior—and pragmatist philosophy—on experience—I have argued how imitation and emergence have the potential to provide the experiential
qualities of being a part of a *we-phenomenon* and a *capricious potential* in the crowd. This conceptual understanding of crowd experience introduces a novel perspective on the distinct sociality of crowds and its relevance to experience-oriented design, which has not yet been explored. To further unfold my conceptual understanding of crowd experience within the field of experience-oriented design, I have created a **conceptual model** based on current understandings of social experiences. The conceptual model presents crowd experiences as a distinct type of social experience different from *collective experiences* that are driven by reflective behavior. I have argued that crowd experiences should be considered as a type of social experience that builds upon and complements current understandings within experience-oriented design, rather than as something that replaces or negates them. My conceptual work on crowds contributes to interaction design by establishing an awareness of crowds as distinct from other social gatherings and groups that previously have been of interest to designers in this field. This creates a new way of thinking about crowds, which is the first step towards designing interactive technology for crowds with these characteristics. Furthermore, my conceptual model provides a language and sensitivity for the non-rational behavioral dynamics of imitation and emergence in order to support the design of interactive technology for crowd experiences.

The theoretical and empirical research that underpins this dissertation provides a novel perspective on interactive technology for the active and participative spectator crowd: in this instance, spectators at sporting events. It is my belief that such a view on **technology-supported spectator experiences that goes beyond sanitization** is an alternative to contemporary interaction design. A rationalistic perspective on crowds, with a focus on safety, control, organization, and bourgeois behavior, has led to the sanitization of sporting events, in general. The concept of crowd experience offers an alternative perspective that can be used to inform the design of interactive technologies for sporting events, without compromising safety, control, organization, or commercial interests. The spectator crowd helps create and is part of the atmosphere of the stadium, and there is an unexplored potential for interactive technologies that are designed to embrace the rich festive experience of being a part of a crowd.

The **design experiments and concept designs** referenced in this dissertation should not be reviewed as contributions in themselves, their purpose is to materialize and embody the concepts, perspectives, and questions that arose during the more theoretical explorations within my research program.

The contributions made in this dissertation are positioned in the experience-oriented design approach within academic interaction design. My research has led me to argue that interaction designers and researchers could benefit from considering the distinct sociality of crowds and exploring the non-rational behavioral dynamics of imitation and emergence when designing interactive technology for crowd experiences. Thus, I consider my contribution as one answer that hopefully will motivate and engage other researchers to explore crowd experiences and raise further questions. Considering
crowds as a distinct sociality when designing technology-supported crowd experiences will hopefully affect future interaction design in the following ways:

First, considering crowds as a distinct sociality opens up new perspectives on social interactions that can benefit interaction designers and inform their future design processes and concepts. To date, most interactive technologies for sporting events, for example, aim to give the individual crowd members more information about the event itself, but there is little thought put into what it feels like to be a crowd member and whether technology could enhance that experience. Not only, may interaction designers and researchers reconsider and reflect upon current technological systems that are designed to support crowds. But, having an awareness of crowds’ distinct sociality may also affect how interaction designers and researchers approach future design processes, appreciate crowds, and make decisions when designing interactive technology for crowds.

Second, within experience-oriented design, crowd experiences could be considered as a new type of social experience. There has been a tendency in HCI to view crowds as similar to other social groupings such as those you find in a workplace. Such groups are usually characterized by their reflective and rational behaviors. Here, I argue that crowds are different and can be non-rational in nature, and thus it is important for this difference to be acknowledged. Through my investigation of the crowd experience I developed a conceptual understanding of the non-rational behavior of crowds, which is embedded in the imitative and emergent aspects of crowd theory. As previously mentioned, my contribution nuances, furthers, and complements the current field of experience-oriented design, rather than replacing and discarding it. Technology-supported crowds are becoming an ever larger part of peoples’ festive everyday lives. Concerts, festivals, and sporting events, just to mention a few, are events that increasingly explore and invest in new types of interactive technology. In that perspective my conceptual model on crowd experience provides interaction designers and researchers with a language and vocabulary of both crowds and crowd experiences that makes them able to have a particular sensitivity towards crowds when designing interactive technology for crowd experiences that go beyond sanitization.

9.1 Epilog
Writing the dissertation overview seems to have been a process of asking more questions than I have answered. During this process, my contributions have been refined and distilled in order to reach the current state. However, in this section I will aim to address the questions that seem most relevant and interesting to pursue in the future.

With the introduction of my conceptual understanding of crowd experiences in experience-oriented design, I have only scratched the surface of technology-supported crowd experiences. Crowds are still novel phenomena within interaction design and HCI in general, and thus I believe that there is a need for further conceptual explorations of technology-supported crowd experiences. Sociological crowd theory is an extensive and diverse field and the new revival of suggestive crowd theory might provide further
understandings and perspectives on crowds. Not only is this ongoing post-modern (re) spurring of suggestive crowd theory highly interesting in itself, but in relation to HCI this provides, as I see it, a new unexplored social phenomena within HCI that potentially can led to new types of interactions and experiences with technology.

Experience-oriented design has primarily been driven by Dewey’s philosophy on experience, education, and democracy. But I think there is an interesting potential in furthering Bakhtin’s philosophical accounts on pragmatism to complement Dewey’s perspectives. More specifically, I find Bakhtin’s interest in the grotesque highly relevant as his concern for the transcending and symbolic destruction of official norms provides more nuanced perspectives on the full range of rich experiences. Interactive technologies that relate to the preposterous and non-rational aspects of experience are already becoming an increasing part of peoples’ festive lives, and I believe such accounts can potentially broaden the scope of the kinds of rich experiences designers and researchers can deliver through interactive technologies.

On a more concrete level, my research have been carried out and related to spectator crowds at sporting events. However, the festive crowds that this dissertation concerns could very well be found in other domains such as festivals and concerts. These domains have the potential to enhances the crowd experience by exploring and experimenting with new types of interactive technology. I would argue, however, for these initiatives to be truly successful more studies and experiments are needed in order to explore how the experience of being a part of a concert or festival crowd can be supported with interactive technology.


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PART II: INCLUDED PAPERS
Designing technology for active spectator experiences at sporting events

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Abstract

This paper explores the active spectator experience at sporting events, by presenting and reflecting upon a design experiment carried out at a number of football1 events. The initial hypothesis of the design process, leading to the design experiment has been that the spectator experience is not merely an experience of receiving and consuming entertainment. It is also heavily reliant on the active participation of the spectator in creating the atmosphere of the entire event. The BannerBattle experiment provides interactive technology in sport arenas with a form of interaction based on existing behaviour in the context. The work presented also argues for a need to overcome the inclination to designing technological systems that imitate or compete with the experience of watching the television broadcast of the game. Experiments such as the presented BannerBattle are cornerstones in our exploratory research-through-design approach to designing technologies for social experiences.

1. Football is also known as soccer in some countries.
Publication removed because of copyright
Abstract

We introduce crowd experience as an emergent field in interaction design research. Crowds as social phenomena are already well-established as a research theme in sociology and social psychology. However, the understanding of crowds as users of technology is so far unexplored. Based on the existing literature on crowd behavior, we identify three distinct qualities of crowd experience, which we introduce to interaction design: imitation, emergence, and self-organization. These three qualities informed the design of the research prototype, BannerBattle, which is an interactive display to support crowd experiences at football stadiums. Based on findings in the case study, we discuss how crowd theory complements and challenges existing experience-centered design approaches. We suggest that crowd theory is an important resource when designing technology to support crowd experiences. Moreover, a focus on crowd experience may nuance and expand the already well-established field of experience-centered design research.
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When noise becomes voice: designing interactive technology for crowd experiences through imitation and invention

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Abstract

In this paper, we present crowd experience as a novel concept when designing interactive technology for spectator crowds in public settings. Technology-mediated experiences in groups have already been given serious attention in the field of interaction design. However, crowd experiences are distinctive because of the spontaneous, uninhibited behavior exhibited. In crowds, extreme sociality and the experience of performing identity in public emerge spontaneously. By bridging crowd theory and pragmatics of experience, we establish an understanding of crowd experience as a distinct sociality within interaction design that unfolds through imitation and invention. We deploy that understanding in an exploration of spectator experiences at three football matches in which an experimental prototype, BannerBattle, was deployed. BannerBattle is an interactive banner on which spectators can grab space in competition with their rivals. The more noise and movement they make, the more screen real estate they gain. BannerBattle therefore enabled us to explore the emergence of imitative and at times inventive behavior in enriched crowd experience, by augmenting and supporting spectator performance in this way. We discuss the value of a conceptual understanding of crowd experience for technology as an unexplored potential for designing new interactive technology at spectator venues.
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Abstract

We address the challenge of creating intersections between children’s everyday engagement and museum exhibitions. Specifically, we propose an approach to participatory design inquiry where children’s everyday engagement is taken as the point of departure. We base our discussion on a design workshop—*Gaming the Museum*—where a primary school class was invited to participate in exploring future exhibition spaces for a museum, based on their everyday use of computer games and online communities. We reflect on the results of the workshop, and broadly discuss the everyday engagement of children as point of departure for designing interactive museum exhibitions.
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